



**US Army Corps  
of Engineers**  
Rock Island District

Defense Environmental Restoration Program  
For  
Formerly Used Defense Sites  
Ordnance and Explosives



## Archives Search Report

### FINDINGS

for the former

# **NELLIS SMALL ARMS RANGE**

LAS VEGAS, NEVADA  
Project Number J09NV051001

July 1996



**Moving Target Ranges at  
the Las Vegas Gunnery School**

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM

for  
FORMERLY USED DEFENSE SITES

FINDINGS

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ARCHIVES SEARCH REPORT  
for the former  
NELLIS SMALL ARMS RANGE  
LAS VEGAS, NEVADA  
PROJECT NUMBER J09NV051001

July 1996

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ORDNANCE AND EXPLOSIVES  
 ARCHIVES SEARCH REPORT  
 for the former  
 NELLIS SMALL ARMS RANGE  
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 PROJECT NUMBER J09NV051001

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ORDNANCE AND EXPLOSIVES  
ARCHIVES SEARCH REPORT  
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PROJECT NUMBER J09NV051001

1. INTRODUCTION

a. **Subject and Purpose**

(1) This report presents the findings of an historical records search and site inspection for ordnance and explosives (OE) presence located at the former Nellis Small Arms Range. The investigation was performed under the authority of the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP FUDS).

(2) The investigation focused on 36,378.28 acres of land that was used initially by the Army Air Force as a ground gunnery range during WW-II and later by the Air Force as an emergency jettison area and explosive ordnance disposal (EOD) area.

(3) The purpose of this investigation was to characterize the site for potential OE contamination, to include conventional ammunition and chemical warfare material (CWM). The investigation was conducted by experienced ordnance experts through thorough evaluation of historical records, interviews, and on-site visual inspection results.

b. **Scope**

(1) This report presents the site history, site description, real estate ownership information, and confirmed ordnance presence (prior to and after site closure), based on available records, interviews, site inspections, and analyses. The analyses provide a complete evaluation of all information to assess current day potential ordnance contamination, where actual ordnance presence has not been confirmed.

(2) For the purpose of this report, OE contamination consists of live ammunition, live ammunition components, CWM, or explosives which have been lost, abandoned, discarded, buried, fired or thrown from demolition pits or burning pads. These items were either manufactured, purchased, stored, used, and/or disposed of by the War Department/Department of Defense. Such ammunition/components are no longer under accountable record control of any DOD organization or activity.

(3) **Expended** small arms ammunition (.50 cal or smaller) is **not** considered OE contamination. OE further includes

"explosive soil" which refers to any mixture in soil, sands, clays, etc., such that the mixture itself is explosive. Generally, 10 percent or more by weight of secondary explosives in a soil mixture is considered explosive soil.

2. PREVIOUS INVESTIGATIONS/PROJECTS

a. **1994 Preliminary Assessment**

(1) A Preliminary Assessment of the Nellis Small Arms Range was conducted under the Defense Environmental Restoration Program, Formerly Used Defense Sites (DERP FUDS) by the Corps of Engineers, Los Angeles Division (see reference B-1). At that time, the Findings and Determination of Eligibility (FDE), dated 30 August 1994, concluded that 36,378.28 acres had been formerly owned or used by the Army Air Force/Department of Defense.

(2) The FDE concluded that there were eligible categories under the DERP/FUDS program. Since the site was found to have been used as a training, demolition, and jettison area, an Ordnance and Explosives (OE) project was recommended, DERP FUDS Project Number J09NV051001, which is the subject of this report (see document E-3).

TABLE 2-1 DERP-FUDS PRELIMINARY ASSESSMENT PROJECTS				
Project Number	DERP Category	Present Phase	Comments	Location
J09NV051001	OE	SI	Ordnance and Explosives	See plate 3
	BD/DR	-	None Recommended	
	HTRW	-	None	

b. **Other Investigations**

No other investigations or studies relevant to DERP-FUDS were discovered during this Archives Records Search.

3. SITE DESCRIPTION

a. **Existing Land Usage**

(1) The former Nellis Small Arms Range is located in Clark County, 6 miles northeast of Las Vegas, Nevada and 2 miles north of Nellis Air Force Base.



(2) Part of the property is used by the U.S. Fish and Wildlife Service as part of the Desert Game Range; the remainder of the property is owned by the Bureau of Land Management and is used primarily for public access and recreational activity. An active U.S. Air Force small arms range abuts this area on the southeast corner but is not considered part of the FUDS (see plate 3).

(3) Table 3-1 shows current land usage.

TABLE 3-1 CURRENT LAND USAGE					
AREA	FORMER USAGE	PRESENT OWNER	PRESENT USAGE	SIZE/ ACRES	COMMENTS
A	37mm Burial Area	BLM	Wildlife Mgmt.	2,782	See plates 3,4
B	Bomb Jettison Area	FWS	Wildlife Mgmt.	9,267	See plates 3,4
C	Bomb Jettison Area	BLM	Wildlife Mgmt.	8,016	See plates 3,4
D	Bomb Jettison Area	BLM	Recreation	1,094	See plates 3,4
E	Bomb Jettison Area	BLM	Recreation	15,219.28	See plates 3,4
Total Acres:				36,378.28	

**b. Climatic Data**

(1) Material in paragraphs 3.b.(2) through (4) was extracted primarily from the Local Climatological Data, Annual Summary With Comparative Data for Las Vegas, Nevada, dated 1993 (see reference B-7).

(2) Clark County is located in the southwestern portion of the state. Weather factors for the Las Vegas recording station are used in this assessment. The factors that determine weather patterns include location of Nevada on the eastern, lee side of the Sierra Nevada Mountains, prevailing winds from the west that drop precipitation on the western side of the Sierras, and wild local variations due to differences in topography and elevation.

(3) The annual precipitation averages 4.21 inches (1964-1993 avg. mean). The wettest months are usually March and January. The months with the least amounts of precipitation are May and June (see reference B-8).

(4) The average temperature ranges from daily minimums in January and December of 32.7 to 33.6° F to daily mean high temperatures of 83.5-89.8° F in June, July, and August. The lowest temperature observed was 8° F in January and the highest temperature was 116° F in July (see reference B-8). Mean number of days with temperatures over 90° F is 132. Mean number of days 32° F and below is less than one-half (see reference B-7).

(5) The average snowfall each winter is from a trace to up to 16.7 inches. The relative humidity averages from 21 to 40 percent throughout the course of the day (see references B-7 and B-8).

(6) Flooding, especially flash flooding, is likely to occur in the area of the site after thunderstorms due to the topography and soil consistencies (see reference B-7).

#### **c. Topography**

(1) Clark County lies on the southern edge of the state and is part of the Great Basin. Average elevations in the area of the site are from 3,000 to 7,800 feet. The terrain varies quite sharply from steep, craggy mountains to broad alluvial fans on the valley floor.

(2) The site is traversed by gullies, canyons, and arroyos making transportation difficult. Roads are generally jeep tracks and impassable during certain portions of the year.

#### **d. Geology and Soils**

(1) Material in paragraphs 3.d.(2) and 3.d.(3) was extracted from the current Soil Survey of Clark County, Nevada (see reference B-40).

##### **(2) Regional Geology/Soils**

(a) The geology of Clark County is generally categorized by beginning with the sedimentary formations in the mountains that have gravitated to the basin floor. This in turn becomes alluvial fan piedmont characterized by coalescing fans dissected by numerous drainage channels. Sedimentary formations of dolomite and limestone from the early Cambrian to the early Devonian are present, with the occasional appearance of interbedded quartzite, and shale beds. The Tertiary rock in the mountains ringing the site area are mainly basalt, rhyolite and latite and classified as volcanic extrusions. The valley floors

that make up the main portion of the site are quarternary in nature, made up of a detritus from the bedrock areas carried by intermittent flash flooding to the margins of valleys and alluvial fans. Larger amounts of coarse debris are deposited along the edges of dry watercourses (see reference B-40).

(b) The soil is of all sizes of rock debris ranging from clay-sized fragments to boulders. The soil is not suited for agricultural purposes and lack of water kills all but the hardiest desert shrubs.

### (3) Site Specific Geology/Soils

The soil on this site is Weiser extremely gravelly fine sandy loam with 2 to 8 percent slopes (see reference B-40). The Weiser series consists of very deep, well drained soils on erosional fan remnants. The soil is largely derived from limestone. About 80 percent of this soil type is actually small pebbles. A dark desert varnish is found on the exposed surfaces of these rock fragments. Calcium carbonate content ranges 40 to 60 percent, confirming the limestone foundation of this soil. The fine earth fraction averages fine sandy loam or sandy loam and has a clay content of 5 to 18 percent. The profile is moderately or strongly alkaline. This is the only soil type on the site.

#### **e. Hydrology**

The 4.21 inch average rain fall for the Las Vegas area is a reliable estimate for this area due to proximity of the site to Las Vegas. (see reference B-11). Surface water on this site is runoff from the mountainous areas to the north and northeast of the site. Small springs and seeps are located in several places on the site but these are largely seasonal and provide no steady supply of water.

#### **f. Natural Resources**

(1) There are several endangered animals and plants listed as endangered species to be protected in this portion of Nevada by the Department of the Interior, U.S. Fish and Wildlife Service (see reference B-6).

(2) The following species are recognized as threatened, endangered, or sensitive by the State of Nevada or the Federal Government and are presented in tabular form in table 3-3:

**TABLE 3-3  
NATURAL RESOURCES\***

Resource Classification	Type	Comment
Mammal	None	
Bird	None	
Amphibian/Reptile	Desert Tortoise	E (F,N)
	Amargosa Toad	T (F)
Fish	Pahrump Poolfish	E (F)
	Warm Springs Pupfish	E (F)
Plant	Amargosa Niterwort	E (F)
	Mojave Sweet Pea	S (F)
Insect	None	
E = Endangered		S = Sensitive
N = Nevada		T = Threatened
F = Federal		

\*References B-6 and B-10

**g. Historical/Cultural Resources**

According to the State Historical Preservation Office (SHPO) for Nevada, maintenance of an inventory of historic and cultural sites is contracted to the University of Nevada at Las Vegas' Harry Reid Center for Environmental Studies. Ms. Blair of that office informed the HRS researcher for this site that the least expensive and most feasible way to inventory and categorize historical/cultural sites was to do so after it had been determined which areas are to be remediated. No information specific to the site was discovered, however, when remediation is considered for this site, the SHPO should be contacted for specific guidance (see appendix A, Reference sources).

**4. HISTORICAL ORDNANCE PRESENCE**

**a. Chronological Site Summary**

(1) The site was authorized to be acquired from the Department of the Interior as part of a 4,043,339.55 acre tract specified in Executive Order 8578, 29 October 1940, for use as a bombing and gunnery range (see reference B-31). The 46,953.75 acre area was transferred from the Department of the Interior in December 1941 to be used as a moving target machine gun range.

Approximately 25,620 acres were relinquished to the Bureau of Land Management (BLM) in August 1954. An additional 10,758.27 acres were relinquished to the Fish and Wildlife Service in July 1961. The site was used by Air Force, Marine Corps and Navy personnel from Nellis Air Force Base and Lake Mead Base for small arms weapons ranges. The site was also used as an emergency drop area for hung bombs, wing-tip tanks and pylons. The Air Force also utilized a portion of the area as an explosive ordnance disposal area. Numerous range clearances have been conducted and are documented in appendix F. OE continues to be discovered on the site. The Air Force Small Arms Range which is adjacent to this site is active and still in use. Its acreage is not considered in this report.

#### **b. Ordnance Related Records Review**

(1) Sources checked in the search for any OE contamination included:

- [a] National Archives
- [b] Regional Archives
- [c] The Military History Institute
- [d] U.S. Army Center for Military History
- [e] Emergency Ordnance Disposal (EOD) Units
- [f] Local Police Department
- [g] Local Sheriff's Department
- [h] County Courthouse

(2) For a complete list of sources checked, see appendix A, Reference Sources.

(3) Documentation discovered in the course of the Archives Search showed that the former Nellis Small Arms Range was first envisioned before World War II for training flexible machine gunners assigned to the Las Vegas Bombing and Gunnery School (see F-1). Numerous documents refer to construction of ranges and ammunition supply and logistics matters (see F-2 to F-4) necessary to properly run a training area. Power turrets were requested in December 1941 (see F-5). References F-6 and F-7 discuss a request for the delivery of 20mm and 37mm AA guns. The use of tracer shotgun ammunition is discussed in reference F-8. The moving target ranges and numbers of students expected to be trained are discussed in reference F-9. The aforementioned documents all date from World War II. The next two references discuss the construction of a 600 yard rifle range in 1955 to be jointly shared by Nellis Air Force Base and Lake Mead Base (see F-9).

(4) Explosive Ordnance Disposal team range clearance documents exist and were carefully studied to determine areas of confirmed and potential OE contamination, as well as density of that contamination. Clearances were conducted in 1972, 1977, 1978 and 1995.

Large amounts of OE were recovered (see references F-10, F-11, F-12, and F-13). These documents were responsible in part for the risk assessments for this site.

(5) A declaration of excess dated June 1971 details the types of munitions items that could be expected to be found on the range (see reference G-2 and map L-3). Included were practice bombs and HE rockets.

(6) Review of newspaper microfilm, clipping files, and vertical files at the Nevada Room of the Las Vegas Central Library revealed no evidence of the discovery of OE at the former Nellis Small Arms Range.

### **c. Interviews with Site Related Personnel**

(1) CPT Swoboda, Nellis AFB EOD, had a wealth of information concerning OE at the former Nellis Small Arms Range. His unit does the range clearances on the active portions of the Nellis Range and would be the responders if ordnance was discovered in/on FWS/BLM lands, like Nellis Small Arms Range, that border the active Range. He was the officer in charge of the last range clearance of the area and his final report with OE recovered and map of their locations is at reference F-13. He stated that OE items discovered off range are recovered by Nellis ordnance personnel in the interest of public safety (see interview I-1).

(2) SSG Quinn, 259th EOD, Fort Irwin was the staff duty NCO. SSG Quinn had no information on discovery or removal of ordnance and munitions items in the former Nellis Small Arms Range area. He acknowledged that his unit does have responsibility for the area in which Nellis Small Arms Range is located, but, in practice, leave discoveries of Air Force munitions for the Air Force's disposition. He suggested I speak with Air Force EOD personnel and gave me a POC (see interview I-1). He had no other pertinent information (see interview I-2).

(3) Dr. Wilman is the Staff Historian for WTC and is very familiar with all aspects of the Nellis Range Complex. She was familiar with instances of OE being discovered in the area where Nellis Small Arms Range is located. She has intensively searched the archives for us in this respect after prior coordination with the HRS team's Mr. Meekma. She directed us to

EOD Captain Swoboda (interview I-1) (see interview I-3).

(4) Mr. Cook is currently an employee of the Bureau of Land Management in Las Vegas and is quite familiar with the property in question at the former Nellis Small Arms Range. He has visited the property several times in the course of his duties and has never seen any evidence of OE in the area. He is familiar with OE from his time in the military and spoke knowledgeably about military activities in the surrounding areas including other FUDS sites now under study (see interview I-4).

## 5. SITE ELIGIBILITY

### a. **Confirmed Formerly Used Defense Site**

(1) Former land usage by the Army was previously confirmed for the entire 36,378.28 acre site as summarized in section 4 of this report.

(2) There are no recapture or restricted use documents on record for the former Nellis Small Arms Range.

### b. **Potential Formerly Used Defense Site**

No previously unknown potential Formerly Used Defense Sites were identified by the site inspectors during the course of the visual inspection and review of historical documents.

## 6. VISUAL SITE INSPECTION

### a. **General Procedures and Safety**

(1) During the period 15-21 February 1996, members of the Site Inspection (SI) team traveled to Nevada to assess several FUDS including the portion of the former Nellis Small Arms Range returned to the public domain. The team did not visit the fenced, active range which is not a part of this report. The primary task of the SI team was to assess OE presence and potential due to the usage of the site as a machine gun range and emergency jettison area for the Las Vegas Bombing and Gunnery School during World War II. Contamination from present day usage of ordnance in areas adjacent or in the sky above the FUDS is not within the purview of the DERP-FUDS program and must be addressed separately.

(2) A site safety plan was developed and used by the SI team to assure an injury-free site inspection of the Former Nellis Small Arms Range. A briefing was conducted prior to the SI which stressed that OE would only be handled by military EOD personnel. Site safety and strict adherence to nonintrusive

investigation methods were maintained by the inspection team at all times during the on-site inspection.

(3) Prior to the site visit, a thorough review was made of available reports, historical documents, texts, and technical ordnance manuals (see materials referenced in Appendix A gathered during the ASR historical records search). This review was made to ensure team awareness of potential ordnance types and hazards.

(4) The actual inspection of the former Nellis Small Arms Range began on 16 February 1996, when the SI team visited the area of the site.

**b. Area A: Buried 37mm HE Area**

(1) The site was surveyed with the aid of a 4-wheel-drive vehicle and existing maps and drawings provided by Nellis EOD (see map L-3).

(2) The SI team first surveyed the portion of the site indicated as a potential ammunition burial site for 37mm HE by the INPR. This survey was conducted on foot with all appropriate cautions taken to avoid injury and heat fatigue. No of evidence of OE was noted. The area was walked by the assessment team three abreast, taking care to carefully inspect gullies similar to the ones mentioned in the EOD reports of 37mm found in the area (see plate 3, photograph J-1 and map L-3). Other OE items have also been discovered in this area (see reference F-13) but are most likely illicit dumps by disaffected individuals.

**c. Area B: Bomb Jettison Area**

This area is mountainous and not vehicle accessible; it was not inspected on foot. EOD personnel who have surveyed the area by helicopter verify the presence of OE such as rockets, practice bombs, and expended wing-tip tanks.

**d. Area C: Bomb Jettison Area**

This area is mountainous and not vehicle accessible; it was not inspected on foot. EOD personnel who have surveyed the area by helicopter verify the presence of OE such as rockets, practice bombs and expended wing-tip tanks.

**e. Area D: Bomb Jettison Area**

This area is mountainous and not vehicle accessible; it was not inspected on foot. EOD personnel who have surveyed the area by helicopter could not verify the presence of OE such as rockets, practice bombs and expended wing-tip tanks but think it likely due to it's designation as an emergency drop area and proximity to the air base.



**f. Area E: Bomb Jettison Area**

This large area was walked east to west by the assessment team members three abreast. Three of the former moving target berms are located on the southern edge of the site. No evidence of OE was noted. This area had large numbers of expended .50 caliber machine gun bullets from its use as an moving target machine gun range (see photographs J-2 and J-3). This area has had one **inert** M117 practice bomb removed by Nellis Air Force Base EOD (See reference F-13).

**7. EVALUATION OF ORDNANCE HAZARDS**

**a. General Procedures**

(1) The site was evaluated to determine confirmed, potential, or uncontaminated ordnance presence. Confirmed ordnance contamination is based on verifiable historical evidence or direct witness of ordnance items. Verifiable historical records evidence consists of ordnance items located on site and documented by the local bomb squad, Air Force and Army Explosive Ordnance Disposal teams, newspaper articles, correspondence, current findings, etc. Direct witness of ordnance items consists of the inspection team directly locating ordnance items by visual inspection. Additional field data is not needed to identify a confirmed subsite.

(2) Potential ordnance contamination is based on a lack of confirmed ordnance. Potential ordnance contamination is inferred from records or indirect witness. Inference from historical records would include common practice in production, storage, usage, or disposal, at that time, which could have allowed present day ordnance contamination. Potential ordnance contamination could also be based on indirect witness or from present day site features. Additional field data is needed to confirm potential ordnance subsites.

(3) Uncontaminated ordnance subsites are based on a lack of confirmed or potential ordnance evidence. Historical records evidence and present day site inspections do not indicate confirmed or potential ordnance contamination. There is no reasonable evidence, either direct or inferred, to suggest present day ordnance contamination. Additional field data is not needed to assess uncontaminated ordnance subsites.

**b. Area A: Buried 37mm HE Area**

(1) Based on the site visual inspection, review of historical documents, and reports of found OE since site closure,

this area is considered **contaminated** in accordance with the standards of paragraph 7.a.(1).

(2) OE has been recovered from this site by Nellis Air Force Base EOD personnel but the precise location was not detailed on a clearance map. 37mm HE projectiles show up after heavy rains and will probably continue to surface due to weather or real estate development. A portion of this area, section 17, also may have served as an EOD demolition area (see map L-3). The area must be treated as contaminated due to pit kick-outs, buried misfires, and the common practice of illicit burial of items.

**c. Area B: Bomb Jettison Area**

(1) Based on review of historical documents, and interviews with Nellis Air Force Base EOD personnel this area is considered **contaminated** in accordance with the standards of paragraph 7.a.(1).

(2) OE has been noted on the ground by EOD personnel doing aerial surveys of the area. The rugged, nearly inaccessible terrain complicates disposal and removal by Nellis AFB EOD.

**d. Area C: Bomb Jettison Area**

(1) Based on review of historical documents and interviews with Nellis Air Force Base EOD personnel this area is considered **contaminated** in accordance with the standards of paragraph 7.a.(1).

(2) OE has such as practice bombs have been noted on the ground by EOD personnel doing aerial surveys of the area. The rugged, nearly inaccessible terrain complicates disposal and removal by Nellis AFB EOD.

**e. Area D: Bomb Jettison Area**

(1) This area was broken out from Area C based on its accessibility. As a result of the site visual inspection, review of historical documents, and common practices of the time, this area is considered **potentially contaminated** in accordance with the standards of paragraph 7.a.(2).

(2) No OE was noted on the site. Individuals familiar with the site have found no evidence of OE contamination (see interviews I-1 and I-4). This area is adjacent to known contaminated and active use areas. This area could have been utilized if required to drop hung bombs and rockets, wing-tip tanks and weapons pylons. It would have been common practice to utilize the area as an emergency drop site; the possibility for contamination by OE exists and must be taken into consideration.

**f. Area E: Bomb Jettison Area**

(1) Based on the site visual inspection, review of historical documents, and reports of found OE since site closure, this area is considered **potentially contaminated** in accordance with the standards of paragraph 7.a.(2).

(2) Although three of the moving targets berms are located in this area, expended small arms are not the primary focus of study in this area since it is not considered OE. No OE was noted on the site during the assessment. One **inert** M117 practice bomb has been removed by EOD and is considered scrap metal and not OE. However, since the area is adjacent to known contaminated areas and an active training range the potential for buried and impacted OE items exists in this area. This area was also available for emergency jettisoning of bombs and racks and may be contaminated with OE.

**8. SITE ORDNANCE TECHNICAL DATA**

**a. End Item Technical Data**

(1) There is historical evidence to indicate that ordnance was used at the Nellis Small Arms Range over a 20-year period.

(2) Table 8-1 is a listing of OE items most likely to have been expended for gunnery training based on the scopes of the training missions and the timeframe 1941-1965as well as observed OE on-site:

TABLE 8-1 AMMUNITION USED AND EXPLOSIVES/CHEMICAL FILLERS		
Type	Model	Filler/Weight
Cartridge, .30 caliber, MG	M2, Ball	Lead antimony
	M1, Tracer	Tracer composition
	M2, AP	Tungsten chrome steel
Cartridge, .30 caliber, Carbine	M1 Ball	Lead antimony
	M16 Tracer	Tracer composition
Cartridge, .45 caliber, Pistol	M1911, Ball	5.6 grains Powder 4648 Copper Plated Steel Bullet
Cartridge, .50 caliber, Machine Gun	M2, Ball	Soft steel/lead
	M2, AP	Tungsten chrome steel

**TABLE 8-1**  
**AMMUNITION USED AND EXPLOSIVES/CHEMICAL FILLERS**

Type	Model	Filler/Weight
Projectile, 20mm HEI	MK IV	.0171 lb. Tetryl .0072 lb. Incend. mix.
Projectile, 37mm, HE-T	M54	.10 lb. Tetryl .025 lb. Tracer Comp.
Fuze	M56 PD	Tetryl booster
Grenade, Incendiary	AN-M14	1.75 lbs. thermite
Warhead, Rocket 2.75"	M229 HE	15.5 lbs. Comp. B
Block, Demolition	M3	2.25 lb. Comp. C-3
Block, Demolition	M4	.50 lb. Comp. C-3
Cord, Detonating		7 lb./100 feet PETN
Bomb, Practice 3 lb. w/signal	AN-MK 23 MK 4	Cast iron 10 gm zinc oxide 3 gm black powder 3 gm smokeless powder Titanium tetrachloride
Bomb, Practice 4.5 lb. w/signal	AN-MK 43 MK 4	Cast lead 10 gm zinc oxide 3 gm black powder 3 gm smokeless powder Titanium tetrachloride
Bomb, Practice 2.68 lb. w/signal	AN-MK 5 MK 4	Zinc Alloy 10 gm zinc oxide 3 gm black powder 3 gm smokeless powder Titanium tetrachloride
Bomb Practice 5 lb. w/signal	MK 105 MK 4	Sheet steel 10 gm zinc oxide 3 gm black powder 3 gm smokeless powder
Bomb, Practice 25 lb. w/signal	MK 76 MK 4	Sheet steel 10 gm zinc oxide 3 gm black powder 3 gm smokeless powder Titanium tetrachloride

TABLE 8-1 AMMUNITION USED AND EXPLOSIVES/CHEMICAL FILLERS		
Type	Model	Filler/Weight
Bomb, Practice 100 lb. w/signal	M38A2	Sheet steel 10 gm zinc oxide 3 gm black powder 3 gm smokeless powder Titanium tetrachloride water/sand mix
Rocket, 5", HE	MK 1 Mod 0	8.6 lbs. TNT

b. Chemical Data of Ordnance Fillers

Table 8-2 has been developed to establish a list of typical explosive/chemical compounds used in the ordnance and chemical items cited in Table 8-1.

Table 8-2 CHEMICAL DATA OF EXPLOSIVE/ORDNANCE FILLERS		
EXPLOSIVE MATERIEL	SYNONYM(S)	CHEMICAL FORMULA
Smokeless Powder	FNH Powder	
Various percentages of: Nitrocellulose	Nitrocotton	$C_3H_5(ONO_2)_3$
Dinitrotoluene	DNT	$C_6H_2CH_3(NO_2)_2$
Dibutylphthalate	Gelling Agent	$C_6H_4(CO_2C_4H_9)_2$
Diphenylamine	DPA; Stabilizer	$(C_6H_5)_2NH$
Black Powder		
74% Potassium Nitrate	Niter, Salt Peter	$KNO_3$
11% Sulfur		S
16% Charcoal		C
TNT	2,4,6 Trinitrotolulene	$C_6H_2CH_3(NO_2)_3$
RDX		$C_3H_6N_6O_6$

**Table 8-2**  
**CHEMICAL DATA OF EXPLOSIVE/ORDNANCE FILLERS**

EXPLOSIVE MATERIEL	SYNONYM(S)	CHEMICAL FORMULA
Pentolite 50% TNT 50% PETN		
PETN	Pentaerythritetetranitrate	$C(CH_2ONO_2)_4$
Lead		Pb
Iron		Fe
Antimony		Sb
Primer Compositions*		
Mercury Fulminate		$Hg(ON)_2$
White Phosphorus	WP Smoke	P
Lead Azide		$Pb(N_3)_2$
Sulfur Trioxide	FS Smoke	$S_2O_3$
Tetryl		$C_7H_5N_5O_8$
Thermite		Al + FE

9. OTHER ENVIRONMENTAL HAZARDS

a. **Hazardous, Toxic, and Radiological Waste**

During the site visit and in the course of reviewing hundreds of documents during the historical records search, evidence of a HTRW consideration came to light due to expended .50 caliber machine gun bullets containing lead in area E of the site (see plates 2 & 3). Any remediation efforts should be coordinated with the Nellis Air Force Base Environmental office and the State of Nevada.

b. **Building Demolition/Debris Removal**

During the site visit, no potential BD/DR projects were noted for consideration as a result of DOD/AAF use during the period 1941-1963.