US Army Corps
of Engineers
Rock Island District

Defense Environmental Restoration Program
for
Formerly Used Defense Sites
Ordnance and Explosive Project

Archives Search Report

FINDINGS
for the former

NELLIS AIR FORCE RANGE AREA A

LAS VEGAS, NEVADA
Project Number J09NV110301

MAY 1996

DEFENSE ENVIRONMENTAL RESTORATION PROGRAM
for
FORMERLY USED DEFENSE SITES

FINDINGS

ORDNANCE AND EXPLOSIVES ARCHIVES SEARCH REPORT FOR

FORMER NELLIS AIR FORCE RANGE - AREA A
LAS VEGAS, NV
PROJECT NUMBER J09NV110301

MAY 1996

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ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORT
FOR
FORMER NELLIS AIR FORCE RANGE - AREA A
LAS VEGAS, NV
PROJECT NUMBER J09NV110301

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ORDNANCE AND EXPLOSIVE WASTE
ARCHIVES SEARCH REPORT
FOR
FORMER NELLIS AIR FORCE RANGE - AREA A
LAS VEGAS, NV
PROJECT NUMBER J09NV110301

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ORDNANCE AND EXPLOSIVES
ARCHIVES SEARCH REPORT
FOR
FORMER NELLIS AIR FORCE RANGE - AREA "A"
LAS VEGAS, NEVADA
PROJECT NUMBER J09NV110301

1. INTRODUCTION

a. Subject and Purpose

(1) This report presents the findings of a historical records search and site inspection for ordnance and explosives (OE) presence located at the former Nellis Air Force Range - Area "A", Las Vegas, Nevada (see plate 1 for general location map). The investigation was performed under the authority of the Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP FUDS).

(2) This investigation focused on approximately 708,621 acres of land that were used by the War Department/Department of Defense. The site was used as a portion of a bombing and gunnery range from 1940 to 1942.

(3) The purpose of this investigation was to characterize the site for potential OE contamination, to include conventional ammunition and chemical warfare material (CWM). This investigation was conducted by experienced ordnance experts through thorough evaluation of historical records, interviews and an 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 contamination where 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 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, sand, clay, 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

a. Preliminary Assessment

(1) A Preliminary Assessment of Nellis Air Force Range Area "A" was conducted under the Defense Environmental Restoration Program Formerly Used Defense Sites (DERP FUDS) by the US Army Corps Of Engineers, Los Angeles District (CESPL) in 1994 (see document E-1). At that time, the Findings and Determination of Eligibility, dated 9 September 1994, concluded that the 748,285 acres located in Nye and Lincoln Counties, Nevada, had been formerly used by the War Department/Department of Defense. That report recommended referral to CEHND for an evaluation of possible ordnance contamination. Table 2-1 represents an overview of the PA phase.

(2) The original Nellis INPR was identified as site number J09NV050800, NELLIS AIR FORCE RANGE /D/, and later broken down into smaller projects. The current site number is J09NV110300. The present project number is J09NV110301 as listed in Table 2-1 (See documents E-1, F-3 and I-19).

(3) There is a discrepancy in acreage between the Inventory Project Report (INPR) and this report. The discrepancy seems to have been caused by not taking into consideration the fact that some sections in this area are not a full 640 acres. Consequently, the site is only 708,621 versus the originally believed 748,285 acres. An example of some adjustments are in document G-4.

TABLE 2-1
DERP-FUDS PRELIMINARY ASSESSMENT PROJECTS

Project Number	DERP Category	Present Phase	Comments	Location
J09NV110301 (J09NV050802)	OE	SI	Ordnance or Explosives contamination	Entire site
	HTRW	-	No projects recommended	
	BD/DR	-	No projects recommended	

b. Other Investigations

(1) The Special Nevada Report, 23 September 1991, was prepared through a joint effort of the Departments of the Air Force, Navy, and Department of the Interior. Subject report is required by the Military Lands Withdrawal Act of 1986 and contains a description of current and proposed defense-related activities in the state of Nevada, an analysis of their impacts, and possible actions which could be taken to mitigate those impacts. Much information is found in the Special Nevada Report, 23 September 1991, portions of which are included in this report as document E-2. However, for the purposes of this report, excerpts are included only to confirm the location of land addressed in this report and to further address the airspace located above this land. The land in question is north and northeast of the present day boundaries of the Nellis Air Force Range

(2) The Environmental Section of Nellis Air Force Base has an active Installation Restoration Program (IRP). Document E-3 is included in this report to show the locations and descriptions of areas addressed by subject program. Documentation shows no IRP sites to be located within the lands addressed in this report.

3. SITE DESCRIPTION

a. Existing Land Usage

(1) The former Nellis Air Force Range - Area "A" is located north and northeast of the present day Nellis Air Force Range boundaries. The area lies within Nye and Lincoln counties Nevada and consists of approximately 708,621 acres. Table 3-1 and Plate 6 contain information for current property ownership and usage.

(2) Although the majority of the area is used for wild life conservation and controlled by the BLM, some areas are leased to ranchers for cattle grazing. The remainder of the land is owned by various private land owners using the land for cattle ranching and farming.

TABLE 3-1
CURRENT LAND USAGE

Area	Former Usage	Present Owner	Current Usage	Size	Comments
A-1	North Bombing and Gunnery Range	BLM	Wildlife Conservation	306,463	See plates 3, 6 and 7 and document G-1
		2 private Owners	Cattle Ranching	1,398	
A-2	Burial Site	BLM	Wildlife Conservation Cattle Ranching	1	See Plates 3, 6 and 7
A-3	East Bombing and Gunnery Range	BLM	Wildlife Conservation	239,214	See Plates 3, 6 and 8 and document G-2
		73 Private Owners		6,962	
A-4	Former Tonopah Bombing and Gunnery Range	BLM	Wildlife Conservation Cattle Ranching	154,583	See Plates 3 and 6
TOTAL				708,621 *	

*** Revised INPR acreage (See paragraph 2a(3))**

b. Climatic Data

(1) The Nellis Air Force Range has a semiarid climate with varied temperatures. Daily and seasonal temperatures fluctuate greatly and are influenced by general air movement and topography. Highest monthly temperatures occur during July and August, with a monthly average of 76 degrees Fahrenheit. Daily temperatures rise to above 90 degrees Fahrenheit and drop to the 50's at night. Average monthly winter temperatures fall between 31 degrees and 41 degrees Fahrenheit.

(2) The climate of the range area is primarily influenced by two main sources of air movement. From fall through spring, the area is affected by northern and middle latitude Pacific air movements which cross the Sierra Nevada Mountains. As moist air moves east from the Pacific, the mountains deplete the moisture, creating a rain shadow effect over the Great Basin and Mojave deserts. In summer and early fall, tropical air masses from southern Pacific zones and the Gulf of Mexico dominate the region.

(3) Annual precipitation is dependent on elevation and varies on the average from 4 inches on the desert floor to about 20 inches at the highest elevations. The annual precipitation cycle is characterized by a double maximum, with the primary in winter and the secondary in the summer. Winter precipitation often falls as snow (at the higher elevations), while summer rains are associated with thunderstorms, many of sufficient intensity to produce localized flash flooding.

(4) Prevailing winds are normally from the southwest, with average wind velocities ranging from 9 to 11 miles per hour in the morning, increasing to 11 to 13 miles per hour in the afternoon (reference B-32).

c. Topography

(1) The topographic features of the Nellis Air Force Range Area "A" are typical of the Basin and Range Physiographic Province, with long, north-south trending mountain ranges separated by broad alluvium-filled valleys. Primary mountain ranges of the area are the Kawich, Groom, and Reveille Ranges.

(2) Elevations range from approximately 4,840 feet around the town of Rachel to 9,404 feet on Kawich Peak in the Kawich Mountain Range. The slope of the terrain increases from 10 percent or less on the valley floors to between 20 percent in the foothills. At the highest elevations, slopes can exceed 45 percent. Much of the upland terrain is heavily dissected by

gullies and ephemeral washes that carry the infrequent rain water to playas on the desert floor below (reference B-31).

d. Geology and Soils

(1) Most of Southern Nevada, including the area now under investigation, Area "A", was submerged under a shallow sea for long periods of geologic time. The present mountains on the range are made up of vast thickness' of sediments deposited from surrounding areas that were above the water. The period of deposition was followed by constricting and folding that brought severe pressure on Nevada from California and Utah. "Basin and range high-angle normal faults ranging in age from Miocene to Holocene are present throughout most of the study Area "And bound mountains and ranges. North-trending normal faults are most common, but northwest trends are prevalent. The present makeup of the mountain terrain is a result of the wearing down of the folds by wind and water erosion.

(2) The soil medium that physically supports the existing vegetation is also the basic component of the watershed for the area. The soils are typical of arid regions and include materials for the alluvial immature consolidated upland classes. The soils of this area generally have many limitations for sanitation or community development facilities. They are generally unsuited for irrigated agriculture. They provide only a fair wildlife habitat. Topographic features of the area demonstrate water erosion characteristics by the many gullies and channels leading from the mountain ranges to the playas on the desert floor.

(3) The physical soil makeup is shallow alluvial sediments usually less than 1,000 feet to bedrock. The area may include some quaternary basalt flows. It consists of coalescing alluvial fans and the soils are usually shallow or moderately deep to hardpans. Texture in the root zone may range from coarse to fine. Gravel is usually present in quantity. Soil surface increases in stoniness upslope. In places, gravely desert pavement occurs (reference B-31).

e. Hydrology

The hydrogeologic environment represented in Area "A" corresponds to the North Range of the present day Nellis Air Force Range. This area is characterized by mountain blocks composed primarily of tertiary volcanic rock, which is the dominant rock-type in Area "A". Common to this hydrogeologic environment is the alluvium-filled valleys, which act as catchment basins or reservoirs for runoff, particularly following

the locally intense thunderstorms that are common during the summer. Often bounded by high angle, normal faults, these basins store very large quantities of water, and release these reserves over a long period of time to the regional ground water systems. Depth to the water table in these basins vary widely, from a few feet to over a 1,000 feet (reference B-31 and document L-4 (figure 2.16)).

f. Natural Resources

The US Fish and Wildlife Service provided a listing of threatened and endangered species that may be found in Area "A". This information is provided in Table 3-2 (Reference B-25, B-35 and B-36).

g. Historical/Cultural Resources

No specific cultural or historical sites associated with this site were found during the archives search, site inspection, or communication with Nevada Historic Preservation Agency, US Fish and Wildlife Service and Nellis Air Force Base Environmental Office. However, any intrusive measures taken within the area will require oversight by the State Historical Preservation Office (SHPO) and/or other like organizations.

TABLE 3-2
NATURAL & CULTURAL RESOURCES

Resource Classification	Type	Comments*
Wildlife	**Mammals**	
	Desert Bighorn Sheep	S
	Spotted Bat	T
	Pygmy Rabbit	T
	Reptiles	
	Desert Tortoise	E
	Amargosa Toad	T
	Western Chuckwalla	T
	Birds	
	White-faced Ibis	T
	Northern Goshhawk	T
	Ferruginous Hawk	T
	Bald Eagle	E
	Peregrine Falcon	E
	Mountain Quail	T
	Snowy Plover (Western)	T
	Mountain Plover	T
	Long-billed Curlew	T

TABLE 3-2 (con't) NATURAL & CULTURAL RESOURCES		
Resource Classification	Type	Comments*
	Black Tern	T
	Loggerhead Shrike	T
	Bell's Vireo (Least)	T
Vegetation	**Flora**	
	Desert Poppy	E
	Utah Agave	T
	Coryphantha vivipara v. rosea	T
	Gilial ripleyi	T
	Perityle megalocephala intricata	T
Cultural/ Historical	None Documented	Coordinate with SHPO
* Key: E-Endangered, T-Threatened, S-Sensitive		

4. HISTORICAL ORDNANCE PRESENCE

a. Chronological Site Summary

(1) The original Nellis Air Force Range was established by President Roosevelt in 1940, by Executive Order 8578, as the Las Vegas Bombing and Gunnery Range. The range consisted of nearly 3,560,000 acres (reference B-31 and document L-2).

(2) In 1942, Executive Order 9019 returned approximately 937,730 acres to the control of the Department of the Interior. Approximately 554,037 acres of this land was part of what was to make up Area "A". Later, in 1953, the Tonopah Bombing and Gunnery Range relinquished approximately 154,584 to the Department of the Interior. These two tracts of land comprise Area "A", approximately 708,621 acres. Area "A" was used as a bombing and gunnery range (See documents L-2, L-5, L-6 and plate 2).

(3) Area "A", which was a portion of the former Las Vegas Bombing and Gunnery Range in 1942, had no specified designated targets for use as bombing and gunnery targets.

(4) The former Tonopah Bombing and Gunnery Range boundaries were established in 1947 and in 1953 portions of the range were relinquished to the Department of the Interior. There was no documentation found to identify specific target locations on the portion that was returned to (DOI).

(5) The majority of Area "A" is still used today as a Military Operations Area (MOA) for flyovers by the pilots from Nellis Air Force Base. This area consists of airspace use only and is not a part of the active firing ranges of Nellis Air Force Range (See Documents E-2, L-1 and plate 5).

b. Ordnance Related Records Review

(1) Research efforts began with a thorough review of all reports, historical documents, and reference material gathered during the archival search appropriate to Nellis Air Force Base and Nellis Air Force Range. During this review, an effort was made to focus on areas of potential OE contamination as described in the OE project summary sheet as well as additional areas that were identified during the research.

(2) Documented evidence of ordnance presence within Area "A" is inferred in the Certificate of Clearance issued by the Office of the Chief of Engineers, US Army Corps of Engineers, dated 31 August 1950. In this document, the EOD team chief states that, "a careful search of the area was made and has been cleared of all dangerous and/or explosive materials reasonably possible to detect". This clearance applied only to the 154,584 acres within Area "A" defined in an attachment to the certificate. The document describes the area cleared as 163,200 acres, but in reality is only 154,584 acres. The sections within these acres are not full 640 acre sections, they are smaller in size (see documents F-1 and plate 3).

(3) A 1944 report by the Sacramento Engineer District of the US Army Corps of Engineers, entitled Evaluation of Carrying Capacities of Airfield Pavements of Tonopah Army Air Base indicates that improvements to the base to allow heavy bomber operations were not completed until 1943. This was after 937,730 acres, including portions of Area "A", were severed from Nellis Air Force Range and returned to the Department of the Interior by Executive Order 9019 of 12 January 1942. This indicates that heavy bomber units assigned to Tonopah could not have conducted practice bomb runs within Area "A" (see documents E-4).

(4) The Special Nevada Report, dated 23 September 1991, indicates that there is a very low probability that airborne ordnance was dropped within Area "A" by accident, in the course of aircraft transiting the airspace above it. This was of concern to the authors, because the Air Force had only airspace transit rights over Area "A", which has been managed by the Bureau of Land Management for the past 50 years. Figures 1.1 and 2.2 of this document (modified by the author of this report)

depict the locations of the present day active ranges in relation to Area "A" (See documents E-2 and plates 1 and 5).

(5) Documentation was found to show bomb targets that were located within the boundaries of the present day Nellis Air Force Range (former Tonopah Bombing Range) but outside the boundaries of Area "A" (See documents F-2, F-4 thru F-7 and Plate 2).

(6) Document L-3, Architectural drawing, Rocket Impact Area, US Atomic Energy Commission, Sandia Area Office, 27 January 1967, was found to indicate that a large part of Area "A" was at one time a rocket impact area. This was later determined to be not completely true (See documents I-13 and I-15).

(7) There is documented evidence of active and on going activities to suggest that the areas of the Nellis Air Force Base Ranges have been and continue to be cleaned of live ordnance. These documents cite range target areas, as well as EOD burial pit locations, none of which are located within the borders of Area "A", the subject of this report (see references B-7 through B-19 and document E-3).

c. Interviews With Site-Related Personnel

(1) Efforts to locate individuals who had served or had first hand knowledge of Area "A" was minimally successful. Personal interviews were conducted with local Nellis Air Force Base employees, Bureau of Land Management representatives, US Fish and Wildlife Service employees, range-related personnel and local law enforcement to obtain information about Area "A".

(2) Major Schofield is the Deputy Commander of the Indian Springs Air Force Auxiliary Field, Range Control Office. He stated that the Nellis Air Force Range does not have any targets located in the area of Area "A" and that he did not know of any contamination being discovered in Area "A". He knew of no targets, ordnance disposal areas, ordnance burning areas within Area "A". He was unaware of any past or present problems with OE in Area "A" (See document I-16).

(3) Major Altchek is the range control officer for the Nellis AFB Bombing and Gunnery Ranges. Major Altchek was familiar with the fact that the Nellis range had been much larger at one time. He was aware also that Area "A" was still a part of a Military Operating Area (MOA) as far as overflying the area was concerned. He was not aware of any ammunition items that had been dropped in Area "A" by accident or on purpose. He stated that when aircraft do drop munitions even on the present day ranges they are reported as to location and status, i.e.

exploded, dud, or practice. If munitions are dropped and do not function as intended, Explosive Ordnance Disposal (EOD) is called to locate and dispose of the item. He was not aware of any targets that may have been in Area "A" (See document I-3).

(4) There were numerous interviews with knowledgeable persons that had no knowledge of Area "A" as a gunnery and bombing range or if ordnance had ever been found in the area (See documents I-1, I-2, I-4 thru I-9, and I-17).

(5) Interviews with Mr. Dykes, a Team Supervisor for Sandia National Laboratories, and Mr. West, an Environmental Health and Safety Manager for the Department of Energy, cleared up the concerns that Area "A" had been contaminated as a rocket impact area as indicated on document L-3. They noted this did not indicate the existence of any practice rocket range. Their input reduced the size of the impact area and confirmed that no live ordnance or explosives remained to cause contamination. There were 3 rockets fired into the atmosphere, but they did not contain high explosives. They were only fired in an east southeast direction below the Mt. Diablo Base Line, thereby decreasing the size of their impact area. The payload contained tri-methyl-aluminum which was dispersed into the atmosphere to help determine downwind possibilities and probabilities. The only thing to return to the earth's surface was metal, i.e. empty payload container and empty rocket motor (See documents I-13 and I-15).

(6) Mr. Metcher is the curator of the Central Nevada Museum. He is very knowledgeable about the history of the Tonopah Army Airfield and surrounding areas. He relayed information about a possible site located north of Highway 6 in Monitor Valley around Belmont, Nevada; this area is not within the boundaries of Area "A". He stated that the site seems to have been used as a target area. The old buildings in the area had holes in them from aircraft cannon fire. He stated that the military had gone in and cleaned up some of the area but he was not sure how much of the area was cleaned up. Mr. Metcher said that he had also recovered ammunition items west of Area "A" and south and east of the Tonopah Army Airfield. These items were not live explosive munitions. He did see live ammunition on the ground around Mud Lake such as .50 caliber ammunition (See document I-14).

(7) Mr. Nicholas Williams is a Realty Specialist for the Bureau of Land Management (BLM) in Tonopah, NV. He has been over the BLM property in Area "A". Mr. Williams relayed that he had seen a 1000 lb. bomb at a miners cabin located in Township 1 North, Range 48 East. He said that the bomb was empty. This was determined by a hole in the top of the bomb. He stated that it seemed to have been used to contain or store a liquid, possibly

water. The bomb seems to have been brought to the cabin from some other location. Mr. Williams described the bomb as being about the thickness of boiler plate with the fins still attached. The fins were thinner than any of the body of the bomb. He also had seen old bomb casings in other locations but could not pinpoint any locations. He has seen no live ammunition items in his travels over the BLM owned land in Area "A", nor had he seen large quantities of bombs in an area as if the area had been used as a bomb target. He stated that he was familiar with bombs and what they looked like because he had been an aircraft mechanic in the Air Force for four years. He worked on F-101 and F-102 aircraft (See document I-11).

(8) Mr. Tucker works for the Bureau of Land Management, Caliente, Lincoln County, NV as a Realty Specialist. He has worked in this area for the last nine years. He says that he is very familiar with the area of Lincoln County that belongs to (BLM) and located in Area "A". He said that the only ammunition items that he was aware of being in his area of concern had been from aircraft crashes. He stated that the crashes were reported to Air Force EOD. The Air Force EOD units always cleaned up any ammunition or explosive items and took them away. He did not know of any other ammunition items, target areas, or ammunition disposal areas within Area "A" in Lincoln County. Mr. Tucker said that he was in the military and is familiar with military munition items (See document I-12).

(9) Mr. Joe Fallini is the owner of Twin Springs Ranch and has lived in this area all his life (approximately 73 years). His family has owned the ranch since the 1870's. Although he owns property located within Area "A", the ranch is located north of Area "A" (See Plates 6 and 7). When asked about his knowledge of ammunition items, Mr. Fallini replied that the military had performed cleanup operations in the area during 1950-1955. He stated that the munitions that were picked up during the cleanup were, "buried at Reed's Ranch" (See Plate 3). He recalled the exact location of the burial location. Mr. Fallini stated that he knew of no live ammunition items being picked up during the cleanup operations, just the spotting charges. The cleanup operation consisted of picking up thin skinned bomb casings and sand filled casing that were used for bombing practice during WWII. Mr. Fallini said that he and other ranchers were shown how to recognize live munition items during the cleanup operations, i.e., was there a burster present in the bomb, was the casing burst open, or was there any fuzing in the munition item. If munition items could not be determined to be safe the ranchers were to call EOD at Nellis AFB. Mr. Fallini said he could not pinpoint any specific locations were he had spotted old casings because he had not found any that were live. He only covers his ranch by helicopter and giving specific locations would be difficult to impossible. He said he had only seen practice

munition items such as the old thin skinned sand filled practice bombs (See document I-10).

(10) The Agee family has ranched south of the Rachel, Nevada area since 1984. Mr. Agee has found ammunition items during his work as a cattleman. The finds were of empty practice bombs that had been burst open, approximately 15 miles apart, and of .50 caliber ammunition, both belted and empty cartridge cases. His ranch is in sub-site Area A-3 (See document I-18 & Plate 6).

5. SITE ELIGIBILITY

a. Confirmed Formerly Used Defense Site

Former land usage by the War Department was previously confirmed for the entire site as summarized in section 4a of this report. The 708,621 acres of the former Nellis Air Force Range - Area "A", located north and northeast of the present day boundaries of the Nellis Air Force Range and the Tonopah Test Range, Nevada was used by the War Department/Department of Defense as a Bombing and Gunnery Range. Historical documents and personal interviews confirm this finding. The majority of Area "A" is still used today as a flyover zone by the Department of the Air Force (See plate 5).

b. Potential Formerly Used Defense Site

There is an area due north of the former Tonopah Army Air Field in Monitor Valley around Belmont, Nevada that should also be investigated as a possible FUDS site. The actual acreage and boundaries are not known (See document I-14 and Plate 4).

6. VISUAL SITE INSPECTION

a. General Procedures and Safety

(1) During the period of 31 October through 11 November 1995, members of the Assessment Team traveled to the former Nellis Air Force Range - Area "A". The primary task of the team was to assess OE presence and potential due to its former usage as a bombing and gunnery range by the War Department/Department of Defense, as stated in the INPR. Site inspection was limited to non-intrusive methods; i.e. subsurface sampling was not authorized nor performed.

(2) Real estate rights-of-entry were not obtained nor deemed necessary, as the vast majority of land in question is public land and somewhat accessible to the team.

(3) A site safety plan was developed and utilized by the assessment team to assure safety from injury during the site inspection of this facility. Prior to the inspection, a briefing was conducted which stressed that OE should only be handled by military EOD personnel (reference B-26).

(4) Prior to the site visit, a thorough review of all available reports, historical documents, texts, and technical ordnance reference materials gathered during the historical records search portion was made to ensure awareness of potential ordnance types and hazards.

(5) Due to the immense size of Area "A" the inspection was conducted primarily by vehicle. The team stopped at various points around Area "A" to inspect the area on foot.

(6) The site is being broken down into sub-sites for this report: i.e., Area A-1 is North Bombing and Gunnery Range, Area A-2 is a Burial Site, Area A-3 is East Bombing and Gunnery Range and Area A-4 is the former Tonopah Bombing and Gunnery Range (See Plate 3).

b. Area A-1: North Bombing and Gunnery Range

(1) This sub-site of Area "A" is within the boundaries of Nye county Nevada, approximately 307,861 acres. This area was designated as a bombing and gunnery range in 1940 and relinquished in 1942 to the Department of the Interior. The greater portion of this area is BLM property. Small segments of the sub-site belong to cattle ranchers who use the larger BLM portions of the area for open grazing of their cattle. This area is very desolate as evidenced by photographs taken at varying locations in Area A-1 (See documents J-1, J-2, J-5) and north of Area "A" (See documents J-6 through J-9 and Plates 3 and 4).

(2) The inspection team did not observe any ammunition items or areas within Area A-1 that could have been a target impact area, ammunition disposal area, or burning area. This site borders the current Tonopah Test Range (TTR)/Nellis AF Range. The TTR is south of Area A-1.

c. Area A-2: Burial Site

This sub-site is within Nye county and located around old Reed's Ranch in Township 2 South Range 52 East. This area, approximately 1 acre, is being pointed out as a burial site of old practice bomb casings, spotting charges and scrap that was buried after a dedudding operation in 1950. The inspection team was unable to precisely locate this area by any visual evidence (See Plates 3 and 4). The sub-site was identified during a telephone interview with Mr. Fallini (See document I-10).

d. Area A-3: East Bombing and Gunnery Range

(1) This sub-site of Area "A" lies within the boundaries of Lincoln County Nevada, approximately 246,176 acres. The greater portion of this area is BLM properties. Small segments of the area belong to cattle ranchers who use the larger BLM portions of the area for open grazing of their cattle. Photographs of the area depict how desolate the area is (See documents J-3, J-4 and Plate 3 and 4).

(2) The town of Rachel, population approximately 100, is located within this area. Rachel was incorporated in 1978 and is located on Highway 375 (Extraterrestrial Way).

(3) This sub-site was also designated as a Bombing and Gunnery Training area during WWII as evidenced by documentation (see Reference B-6 and documents I-10, I-11 and I-18).

(4) The inspection team did not observe any ammunition items, ammunition debris or areas within Area 3 that could have been a target impact area, ammunition disposal area, or burning area.

e. Area A-4: Former Tonopah Bombing and Gunnery Range

(1) This sub-site located within the boundaries of Nye County, consists of approximately 154,583 acres. This area is all BLM property. This area was certified as surface cleared of all dangerous and/or explosive materials in August 1950. Highway 375 traverses this area for approximately 15 miles (See document F-1).

(2) The inspection team did not observe any ammunition items, ammunition debris or areas within Area A-4 that could have been a target impact area, ammunition disposal area, or burning area. This area is also very desolate.

7. EVALUATION OF ORDNANCE HAZARDS

a. General Procedures

(1) Each sub-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 record evidence consists of ordnance items

located on site since site closure and documented by local bomb squads, military Explosive Ordnance Demolition (EOD) Teams, newspaper articles, correspondence, and current findings. Direct witness of ordnance items consists of the site inspection team directly locating ordnance items by visual inspection. Additional field data is not needed to identify a confirmed site.

(2) Potential ordnance contamination is based on a lack of confirmed ordnance presence. Potential ordnance contamination is inferred from records or indirect witness. Inference from historical records would include common practice in production, storage, 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. There is no reasonable evidence, either to direct or inferred, to suggest present day ordnance contamination. Additional field data is not needed to assess uncontaminated ordnance subsites.

(4) There has been no documentation found to indicate that any of the sub areas of Area "A" had specific target locations. The practice of the time was to use geographic features as targets i.e., lake bed, mountain side, cliff facing.

b. Area A-1: North Bombing and Gunnery Range

(1) Based on materiel collected during the ASR, this area is considered a **confirmed** area of contamination. This is based on interviews with local residence and historical documentation and BLM personnel. The interviews indicate that ammunition items have been found within Area A-1 (Reference B-6 and documents I-10 and I-11).

(2) The ordnance found in this area are .50 caliber cartridges, expended .50 caliber cartridge cases. Based on descriptions during interviews the M38A2 100lb (sand filled) practice bomb is the type of practice bomb that could be found in this area. An empty 1,000 lb bomb casing was found in a miner's cabin in Township 1 North Range 48 East. However, it seemed to have been transported there from some other location and was being utilized as a container for liquids, possibly water. Therefore, this is considered an isolated occurrence, and no remaining ordnance of this type is expected (See documents I-10 and I-11

(3) Although visual inspection of the project area showed no signs of lost, abandoned, buried or discarded ordnance or ordnance components, interviews with people who live and travel over the area revealed that they had seen ammunition items within Area "A". This site borders the TTR. The TTR is south of Area A-1.

(4) There are no known target areas within this area. Target areas that have been identified are within the boundaries of the present day Nellis Air Force Range/ TTR. The practice at the time was to keep targets at least 5 miles within the boundaries of the ranges (See document F-7), which would account for no specified targets within the area. Consequently, the degree of contamination can not be rationalized/ evaluated.

(5) EOD personnel have continuously performed range clearance on Nellis Air Force Ranges south of this location on the active ranges over the years but had no documentation of ever being called to clear the area of ordnance or know of any ordnance existing in the project area (See documents E-2, E-3 and I-4).

c. Area 2: Burial Site

This sub-site has **confirmed** contamination and is described as a burial site for the clearance operation that was completed on 25 August 1950. The same type of ammunition items potentially found in Area A-1 could also be found in this area at Reed's old Ranch in Township 2 South, Range 52 East(See documents F-1, I-10 and Plate 3). The precise location is not confirmed.

d. Area A-3: East Bombing and Gunnery Range

(1) Based on materiel collected during the ASR, this area is considered a **confirmed** ordnance sub-site. This is based on interviews with local residents and historical documentation, stating the area was designated a bombing and gunnery range and that ordnance items had been found in the area (See documents I-10, I-18 and plate 3).

(2) Visual inspection of the project area showed no signs of lost, abandoned, buried or discarded ordnance or ordnance components. No expended cartridge cases, scrap metal, or bomb craters were found. However, sub-surface contamination could exist in this area.

(3) The same type of ammunition items potentially found in Area A-1 and A-2 may also be found in this area .

e. Area 4: Former Tonopah Bombing and Gunnery Range

(1) This sub-site has **Confirmed** Ordnance presence due to historical documentation. A "Certificate of Clearance" does exist for this 163,200 acre area. This clearance was completed 25 August 1950. The same types of munitions that could potentially be found in Areas A-1, A-2 and A-3 were found during the clearance of this area according to an interview with a local rancher (See document Plate 3).

(2) Visual inspection of the project area showed no signs of lost, abandoned, buried or discarded ordnance or ordnance components. However, subsurface contamination might still exist.

8. SITE ORDNANCE TECHNICAL DATA

a. End Item Technical Data

(1) While no comprehensive list of the exact types of ammunition used at the former Nellis Air Force Range Area "A" could be located, the general fillers were inert except for the spotting charges (See documents D-1 thru D-3). No evidence exists that chemical warfare materials were used at this site.

(2) Table 8-1, has been developed to establish a list of potential ordnance items and their fillers that could exist at surface or sub-surface levels within the former site. This table has been developed based on historical documentation and personal interviews and circumstances under which this area was used. The model numbers used to delineate possible types are speculative and are based on common models that existed during WWII. Drawings can be found in appendix D.

b. Chemical Data of Ordnance Fillers

Table 8-2, on the next page, has been developed to provide information on the explosive/chemical compounds used in the ordnance cited in Table 8-1.

TABLE 8-1 SUMMARY OF SITE SPECIFIC ORDNANCE		
NAME	MODEL/TYPE	FILLER/weight
.50 caliber Propelling Charge	M2	Steel/711 grains smokeless/250 grains
Bomb Practice 100lb w/Spotting Charge	M38A2 M1	Sand/ 100lb 425 grains of Black powder

TABLE 8-2 SUMMARY OF SITE ORDNANCE FILLERS		
Explosive Material	Synonyms	Chemical Compounds
Black Powder		
74% Potassium Nitrate	Salt Peter; Niter	KNO_3
11% Sulfur		S
16% Charcoal		C
Smokeless Powder	FNH, NH	
Various % of		
Nitrocellulose	Nitrocotton, Ballistite	$[C_6H_7(OH)(ONO_2)_m]_n$ m=0,1,2,3
Dinitrotoluene	DNT	$C_6H_2CH_3(NO_2)_2$
Dibutylphalate	Gelling Agent	$C_6H_4(CO_2C_4H_9)_2$
Diphenylamine	DPA; Stabilizer	$(C_6H_5)_2NH$

9. OTHER ENVIRONMENTAL HAZARDS

a. Hazardous, Toxic, and Radiological

The ASR team did not find any evidence of hazards of any kind, present on this site, that would warrant initiation of an HTRW project.

b. Building Demolition/Debris Removal

There was no evidence found to suggest the presence of any building debris which could be attributed to Department of Defense usage. It is therefore recommended that no BD/DR project be pursued for this site.