SITES THAT DO NOT MEET TRACK 1 CRITERIA, BUT WILL BE MAINTAINED IN THE TRACK 1 PROCESS

Site OE-17

(Antitank [AT] Practice Mine Area)

CONTENTS

TABLES

PLATES

ATTACHMENT

3.17 Site OE-17 (Antitank [AT] Practice Mine Area)

A summary report for Site OE-17 is provided below. This report consists of two parts. The first part, contained in Sections 3.17.1 through 3.17.5, includes a presentation and assessment of archival data. Specific elements include a review of site history and development, evaluation of potential ordnance at the site, a summary of previous ordnance and explosives (OE) investigations, and a conceptual site model. The above-mentioned information was used to support the second part of this report, which is the Site Evaluation (Section 3.17.6). The Site Evaluation was conducted in accordance with the procedures described in the *Final Plan for Evaluation of Previous Work* (*Harding Lawson Associates [HLA], 2000*) and may restate some information presented previously. The Site Evaluation discusses the evaluation of the literature review process (Section 3.17.6.1), an evaluation of the sampling process(es) (Section 3.17.6.2) and an evaluation of the preliminary assessment (Section 3.17.6.3). These discussions are based upon information from standardized literature review and reconnaissance review checklists (Attachment 17-A). Section 3.17.7 provides conclusions and recommendations for the site. References are provided in Section 3.17.8.

3.17.1 Site Description

Site OE-17 is approximately 9 acres in size and located in the southeastern portion of the former Fort Ord (Plate 17-1). Site OE-17 was identified during an interview conducted during the Preliminary Assessment/Site Investigation (PA/SI) phase of the Fort Ord Archives Search (*U.S. Army Engineer Division, Huntsville [USAEDH], 1997*).

3.17.2 Site History and Development

The following presents a summary of the site history and development that is based on archival research and review of historical training maps and aerial photographs. Plates have been prepared that present pertinent features digitized from historical training maps and scanned aerial photographs reviewed by Harding ESE. It should be noted that minor discrepancies between source maps, combined with the natural degradation of older source maps and photographs, has resulted in misalignment of some map features. In addition, camera angle and lens distortion introduced into older aerial photographs, combined with changes in vegetation and site features over time may contribute to the misalignment of some map features with respect to the aerial photographs.

1940s Era

This site lies within a tract of land purchased from private landowners by the government after July 1940 (*Arthur D. Little, Inc. [ADL], 1994*). Review of 1940s era documentation including historical maps and aerial photographs indicates no specific training sites were in use in the area or adjacent to the site. The following identifies the results of the historical review:

- No specific training areas are noted on the 1945 and 1946 maps (*U.S. Army [Army], 1945 and 1946*).
- No specific training areas are evident on the 1945 aerial photo map.

1950s Era

Review of 1950s training maps indicates no activity within Site OE-17. The area directly to the southwest of the Site OE-17 boundary was identified as the "Jack Ranger Station Training Area."

- The 1954 and 1956 maps show the southwestern portion of Site OE-17 within the "Jack Ranger Station Training Area" (*Army, 1954 and 1956*)
- The Fort Ord training maps identify the "Jack Ranger Station", but do not identify the training area (*Army, 1957 and 1958)*. Additionally, the Jack Ranger Station is also identified as SP-6 on the 1958 training map (*Army, 1958*)
- This portion of Fort Ord is not included in the areas covered by the 1950s era aerial photographs.

1960s Era

According to interviews conducted as part of the Archives Search Report (ASR; *USAEDH, 1997*), Site OE-17 was used in the early 1960s as a firing point and target area for shoulder launched (antitank) projectiles. Firing was reportedly from just east of a pond in a westerly direction at a brush-covered mound. The ASR also noted that Site OE-17 was used for land mine training in the late 1960s.

- No indications of land mine training were noted on the 1960s Fort Ord training maps.
- Ranges used for the firing of antitank weapons, including rockets, and recoilless rifles, were present within the Multi-Range Area (MRA) and are shown on the 1961 and the 1964 training maps.
- The 1961 training map shows Site OE-17 within a much larger "Land Navigation LN.3 Area" (*U.S. Army Corps of Engineers [USACE], 1961*).
- The 1964 map identifies the site as "Land Navigation RWO 6" (*Army, 1964*).
- The 1967 map identifies the site as "Land Navigation." A helipad/aviation training area is identified just outside the northeast corner of the site boundary (*Army, 1967*).
- The 1968 map identifies the site as "Land Navigation" and indicates the presence of a training facility within the site boundary. An aviation training area is identified just outside the northeast corner of the site boundary (*USACE, 1968*).
- Review of 1966 aerial photographs for Site OE-17 shows a disturbed area present. However, a site boundary is not distinguishable.

1970s and 80s Era

Site OE-17 continued to be within the Land Navigation training area into the early 1970s. The eastern portion of the site is identified in the Ranges and Training Area Overlay maps from February 1976 through November 1987 as "Training Site 19." The 1976 through 1987 Ranges and Training Area Overlay maps also show a helipad just outside the northeast corner of the site boundary and show the site area within the larger training area "H (4th Brigade)."

- The Training Ranges and General Road Maps (*USACE, 1972*) show this area is indicated as a "Land Navigation" area. A training facility is also indicated within this area and just outside the northeast corner of the site boundary is a helipad area.

- A disturbed area and small structure are present within the site on a 1975 aerial photograph. A larger structure is present outside the site near the eastern border.

- The 1976 and 1984 Training Facilities maps identify "Training Site 19" in this area (*USACE, 1976 and 1984*). The footprint for Training Site 19 shown on the 1976 and 1984 maps is in the same general area as the Site OE-17 boundary provided in the ASR. It should be noted that there is some offset in the digitized features. This is a product of the attainable level of accuracy in registering and digitizing historical maps.

- The 1987 map identifies the area as Training Site 19 (TS-19) and shows a helipad just outside the northeast corner of the site boundary (*Army, 1987*). A training facility is also indicated within this area (*USACE, 1988*).

- A disturbed area and three small structures are present within the site boundary on a 1989 aerial photograph. A structure observed on the 1975 aerial photograph, outside the site boundary is no longer present.

- Review of 1999 aerial photographs for Site OE-17 (Plate 17-2) shows a disturbed area present. The aerial photographs show much of the area covered in vegetation and site boundaries are not distinguishable.

Future Land Use

Site OE-17 lies on property that was transferred to the Bureau of Land Management (BLM) in 1996. Future reuse of this area will be habitat reserve under the jurisdiction of the BLM (*USACE, 1997*). The property is open to the public for hiking, biking, and horseback riding with use restricted to marked trails.

3.17.3 Potential Ordnance Based on Historical Use of the Area

This section describes the types of training devices that could have been used at a practice mine training area and an antitank range in the 1960s. Information on mines, booby traps, and antitank weaponry in use in the 1960s, 1970s, and 1980s was obtained from *Technical Manual, Army Ammunition Data Sheets For Land Mines* (*Army, 1977a*), *Mine/Countermine Operations, FM 20-32* (*Army, 2000a) Grenades and Pyrotechnic Signals FM 3-23.30* (*Army, 2000b*), *Boobytraps FM 5-31* (*Army, 1965*), *Technical Manual, Army Ammunition Data Sheets For Demolition Materials TM 43-0001-38* (*Army, 1981a*), *Technical Manual, Army Ammunition Data Sheets For Rockets, Rocket Systems, Rocket Fuzes, Rocket Motors* (*Army, 1981b*), *Light Antiarmor Weapons, FM 3-23.25* (*Army, 2001*), *90mm Recoilless Rifle, FM 23-11* (*Army, 1965*) *Army Regulation (AR) 385-63* (*Army, 1983*), and interviews (*Stoner, 2002*).

3.17.3.1 Mines

Mines found within and adjacent to Site OE-17 include practice antipersonnel (Model M8) and practice antitank (Model M12). The Model M8 simulates the high explosive M2 series of antipersonnel mines and is used for training in the proper methods and precautions to be observed in the care, handling, laying, booby trapping, arming, and disarming of the M2 and M15 series mines. The Model M12 is intended for

training personnel in the precautions and proper handling methods to be observed in the care, handling, laying and arming, booby trapping, and disarming of the high explosive heavy antitank mine M15.

The Model M8 uses a cardboard projectile containing a spotting charge. The fuze firing mechanism is activated by an applied load of 8 to 10 pounds on any of the prongs or by a pull of 3 to 10 pounds of trip wire. The fuze firing train ignites the delay element in the projectile and also propels it about 2 meters into the air. The delay initiates a black powder spotting charge, which explodes with a loud report emitting smoke. The M8 uses either fuze mine combination practice Model M10 or M10A1. The practice mine can be used many times by replacing the fuze and the cardboard projectile containing the spotting charge.

The Model M12 is shipped empty and then is filled with sand and fuzed in the field. The mine is inert, but explosive components are present in the primary fuze (M604) and in the secondary fuze and activator if used (Model M1). The mine is activated by a force of approximately 565 pounds on the pressure plate of the mine. Functioning of the practice M604 fuze ignites a smoke charge, which emits a cloud of smoke and creates a noise. The mine can also be used as a booby trap and activated by a pull or release of a trip wire attached to either of the secondary fuzes contained in a practice activator (M1). Additional information on practice mines, fuzes, and firing devices is provided in Attachment 1-A2.

3.17.3.2 Booby Traps

Booby traps and mines are often employed together in defensive operations. Use of booby traps with mines increases the obstacle value of the minefield (*Army, 1965*). Booby trap simulators are used for training personnel in the installation, detection and avoidance of booby traps and to imitate the sounds and effects of combat detonations (*Army, 2000b*). When a booby trap simulator is tripped or activated, a pyrotechnic charge functions, and depending on the model of the simulator, produces either a flash and loud report, illumination, or a whistling sound (*Army, 1977b*). Additional information on explosive booby trap simulators is provided in Attachment 1-A2.

The booby trapping of antitank mines may also be employed to slow enemy advancement. If training at Site OE-17 included the practice of disarming booby trapped mines, a firing device and coupling base would have been used. Antitank mines can be booby trapped by attaching pull or pressure release firing devices, providing realistic training in setting and disarming booby traps. The firing device itself contains no energetic material. A coupling base provides the means for holding a primer and positioning it in a firing device so that the firing pin of the firing device will strike it, properly functioning the primer. The coupling base provides a report similar to the firing of a .22 caliber blank and represents approximately the same hazard (*Hall, 2003*).

3.17.3.3 Antitank Weapons

The shoulder launched antitank weapons most commonly used by the Army in the 1960s included rockets (3.5-inch and Light Antitank Weapon [LAW]) and recoilless rifles. Models included the M20 3.5-inch rocket, the M72 LAW, M190 practice LAW, and the M18 and M67 recoilless rifles.

The M72-series LAW is a lightweight, self-contained, portable anti-armor weapon consisting of a rocket packed in a launcher. The launcher may be fired from either shoulder and is issued as a round of ammunition consisting of a 66mm HEAT warhead. The rocket is percussion-ignited, fin-stabilized, fixed munition. It is attached by an igniter to the inside of the launcher. Six spring-loaded fins are attached to the rear of the rocket motor. The fins are folded forward along the motor when the rocket is in the launcher. Although the M72 series is mainly used as an anti-armor weapon, it may be used with limited

success against secondary targets such as gun emplacements, pillboxes, buildings, or light vehicles. Ordnance fired from the M72 series launcher included M72A1, M72A2, and M72A3 HEAT rockets.

The M190 is used to train personnel in the operation and use of the 66mm antitank rocket M72-series. The M190 subcaliber launcher is made by adding a M190 subcaliber conversion kit to an expended M72-series LAW launcher. The M190- subcaliber launcher with M73 subcaliber (35mm) rocket can be used against all solid stationary or moving targets. The rocket is shorter and lighter than the LAW's 66mm tactical rocket and simulates the tactical rocket's smoke and flight trajectory, but with less noise and backblast. The M190 subcaliber launcher is a tubular, telescoping, smooth-bore, open breech weapon. The ordnance fired from the M190 is the 35mm subcaliber practice rocket.

The M20 3.5-inch rocket launcher is a two-piece, smooth bore open tube weapon that is fired electrically. The weapon can be fired from a sitting, kneeling, standing, or prone position. A magneto-type firing device in the trigger grip provide the current for igniting the rockets. Ordnance fired from the M20 included the M28A2 HEAT rocket, M29A2 practice rocket, and the M30 white phosphorous (WP) smoke rocket.

Recoilless rifles are portable antitank weapons that were either shoulder or ground fired, and in some cases could be fired by either method. The guns are capable of firing artillery-type projectiles with an accuracy comparable to those of standard guns, but almost entirely without recoil. The recoilless rifle was developed during WW II and saw limited action by war's end. The weapon was used extensively during the Korean and Vietnam Wars. Recoilless rifles in use by the Army in the 1960s include the M18 57mm, the M20 75mm, the M67 90mm, and the M40 106mm (*Stoner, 2002*). The M18 and M67 could be fired from the shoulder. Explosive ammunition used in the M18 and M67 recoilless rifles included HEAT, WP smoke, and cannister (antipersonnel) in the M18; and HEAT, high explosive plastic (HEP), and APERS (flechette antipersonnel) in the M67. Additionally, target practice (TP) or drill rounds were also used in all models of recoilless rifles.

The projectiles that may have been fired at this site would have been fired roughly parallel to the surface. It is expected that any OE related to these activities would be found at or near the surface.

3.17.4 History of OE Investigations

The following describes the OE investigations that have been conducted at Site OE-17.

1993 Archives Search Report (ASR)

The purpose of the archives search conducted at Fort Ord was to gather and review historical information to determine the types of munitions used at the site, identify possible disposal areas, identify unknown training areas and recommend follow-up actions. Guidance for conducting archives searches did not exist prior to 1995. The 1993 ASR was completed based on the Scope of Work provided to the St. Louis Corps of Engineers by the Huntsville Corps of Engineers and on archive search reports completed at other military installations. The archives search included a Preliminary Assessment/Site Investigation (PA/SI) consisting of interviews with individuals familiar with the sites, visits to previously established sites, reconnaissance of newly identified training areas, and the review of data collected during sampling or removal actions. Requirements for preparation of an ASR are described in Section 2.0 of this report.

Site OE-17 was identified as a site in the 1993 Archives Search Report (*USAEDH, 1993*). In an interview conducted with military personnel it was stated that an inert training antitank (AT) mine was removed from the ground by Explosive Ordnance Disposal (EOD) personnel in this area. The ASR recommended that spot sweeps of the area should be considered (*USAEDH, 1993*).

UXB International Inc. (UXB) Investigation

In 1994, UXB sampled Site OE-17. Six 100- by 100-foot grids (60,000 square feet) were 100 percent sampled (all anomalies detected were investigated to a minimum depth of 3 feet) using either the Schonstedt Model GA-52/C, GA-52/Cx or the GA-72/Cv magnetometers (Plate 17-2). Ninety-six items were removed, 94 of which were small arms ammunition. Two OE scrap items (expended illumination signal and an expended booby trap simulator) were found during grid sampling. No information regarding the depths at which the illumination signal and booby trap simulator were found was provided in the UXB after action report. Information regarding the location of where the items were found within the grids was documented by UXB; however, the orientation of the grids (with respect to north and south) was not provided so the accuracy of the location of the items found is to the sample grid only. No evidence was found to support the use of the area as an impact area (e.g., fragmentation, fuzes, or projectile cases). On the basis of the sampling results, no further OE response was recommended in the after action report (*UXB, 1995b*). A summary of the sampling operations conducted at Site OE-17 is provided in Table 17-1.

1997 Revised Archives Search Report

Additional interviews identified two training areas immediately adjacent to Site OE-17, sites P and Q (Plate 17-2). In 1995, these areas were investigated as part of a site reconnaissance conducted by the USACE Unexploded Ordnance (UXO) Safety Specialist. The site reconnaissance involved walking a portion of sites P and Q using a Schonstedt Model GA-52/Cx magnetometer. No evidence was found to support the use of the areas as impact areas (e.g., fragmentation, fuzes, or projectiles, targets or firing points). However, during the reconnaissance six inert training mines were discovered. A summary of the OE scrap items found during the reconnaissance is provided in Table 17-2. On the basis of the results of the UXB sampling, no further action was recommended at Site OE-17 (*USAEDH, 1997*). On the basis of interviews conducted and the site reconnaissance, an adjacent site was identified, Site OE-27S (TS-19), and site investigation and sampling were recommended (*USAEDH, 1997*). The revised ASR was conducted in accordance with U.S. Army Corps of Engineers guidance (*USAECH, 1995*).

3.17.5 Conceptual Site Model

Conceptual site models (CSMs) are generally developed during the preliminary site characterization phase of work to provide a basis for the sampling design and identification of potential release (functioning of the OE item; e.g., detonation) and exposure routes. CSMs usually incorporate information regarding the physical features and limits of the area of concern (the site), nature and source of the contamination (in this case OE), and exposure routes (potential scenarios that may result in contact with OE).

The CSM for Site OE-17 is based on currently available site-specific and general information including literature reviews, sampling results, aerial photographs, maps, training manuals (AR 385-63, *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat; FM 20-32 Mine/Countermine Operations*), field observations, and the information shown on Plate 17-2. There are three CSMs, one for shoulder-launched projectiles (Plate 17-3), one for an AT practice mine area (Plate 17-4) and one for a bivouac area (Plate 17-5). They are provided to help evaluate the adequacy of the investigation completed to date and to identify potential release and exposure pathways.

3.17.5.1 Training Practices

Training practices are discussed below to provide information on the types of OE that may have been used at the site and the possible location of OE potentially remaining at the site.

Antitank Weapons

Recoilless Weapons Range

Safety design requirements for a recoilless weapons range are presented in the *Policies and Procedures For Firing Ammunition for Training, Target Practice, and Combat* (*Army, 1983*). The surface danger zone for a recoilless weapons range is composed of an impact area (primary danger area), a ricochet area (provided to contain ricochet projectiles), a secondary danger area paralleling the impact area laterally (to contain fragments on the right or left edge of the impact area), a secondary danger area on the downrange side of the impact area (to contain fragments from items exploding on the far edge of the impact area), and a rear danger zone impacted by the effects of the weapon being fired. Depending on the model of the recoilless weapon used, range safety requirements include a minimum distance to impact of approximately 250 to 300 meters, and a maximum range of approximately 2,200 to 8,600 meters. The minimum distance to impact may be reduced by 75 percent if firing non-explosive projectiles from unprotected positions (*Army, 1983*).

3.5-inch and LAW Rocket Range

The 3.5-inch and LAW Rocket ranges include an impact area, ricochet areas to the side and behind the impact area, secondary danger zones located outside of the ricochet areas designed to contain fragments from items exploding or ricocheting on the right or left edge and on the far edge of the impact area, and the area immediately to the rear of a weapon endangered by the effects of the weapon being fired. For the 3.5-inch rocket the minimum safety distance to impact is 250 meters and range length from firing point to the end of the impact area is 950 meters (*Army, 1983*). For the 66mm LAW HEAT rocket the minimum safety distance to impact is 75 meters. For the 66mm incendiary and 35mm subcaliber practice rockets the minimum safety distance to impact is 50 meters. For both the 66mm HEAT and incendiary rockets the range length from firing point to the end of the impact area is 1000 meters. Range length for the 35mm subcaliber is 1150 meters, however, this length may be reduced by waiver if there is steeply rising terrain behind the target or overhead baffles and positive controls are used to limit elevation of the launcher at the firing position (*Army, 1983*). Ranges for antitank weapons, including rockets, bazookas, and recoilless rifles, were present within the MRA and are shown on the 1945, 1946, circa 1954, 1956, 1957, 1958, 1961 and the 1964 training facilities maps.

Mines

Mines are explosive devices that are emplaced to kill, destroy, or incapacitate enemy personnel and/or equipment. They can be employed in quantity within a specified area to form a minefield, or they can be used individually to reinforce nonexplosive obstacles. A minefield is an area of ground that contains mines, or an area of ground that is perceived to contain mines (a phony minefield). Minefields may contain any type, mix, or number of AT and/or antipersonnel (AP) mines. A tank force is the greatest threat to an infantry defense. Protective minefields in this case consist predominantly of antitank mines that reduce the enemy's ability to close quickly onto the infantry's position. Neither AP nor AT mines are used in isolation. The preponderance of mine composition is designed against the most severe close-combat threat and the likelihood of that threat.

Booby Traps

Explosive booby trap simulators that may have been used at Site OE-17 include Models M117, M118, and M119. Explosive booby trap simulators are used during maneuvers as safe booby traps and in training to teach troops in the installation, detection, and use of booby traps. When explosive booby trap simulators are tripped or activated a pyrotechnic charge functions and depending on the model used, produces a flash and report (M117), illumination (M118) or whistling sound (M119) (*Army, 1977b*).

Booby traps are used as psychological weapons and are often employed with mines (nuisance mines) in defensive operations. Booby traps and nuisance mines are generally located in and around buildings, installations, and field defenses, in and around road craters or any obstacle that must be cleared, in natural, covered resting places along routes, in likely assembly areas, along trails and paths, in the vicinity of stocks of fuel, supplies, or materials, and at focal points and bottlenecks in the road or rail systems (*Army, 2000a*).

Booby trapping of mines would have involved the use of a variety of firing devices including the M1 pull type firing device, the M1 and M1A1 pressure activated firing devices, the M3 pull release type firing device and the M5 pressure release firing device. The firing device contains no energetic material unless the coupling base is attached. When the firing devices (with coupling base) are attached to practice mines they provide realistic training in the setting and disarming of booby trapped mines (*Hall, 2003*). Additional information on firing devices is provided in Attachments 1-A2 and 6-A2.

Bivouac Area

Bivouac areas at Fort Ord were used for overnight training and field exercise (*Army, 1980*). Twenty-six bivouac areas had been established by 1980. According to Fort Ord regulations in-place during the time that Site OE-17 was active, use of the bivouac areas were closely monitored. The storage of ammunition was not allowed within 100 feet of a bivouac area. Normally, only blank cartridges, simulators, pyrotechnics, chemical smoke items, and smoke items were allowed to be stored near bivouac areas. However, field storage of sensitive items, demolition materials and small arms ammunition (other than blank) was permitted if clearance was obtained from the division ammunition officer (*Army, 1980*). Ammunition holding areas were to be individually fenced with triple concertina wire or comparable fencing. Depending on the quantity of ammunition stored, an armed guard may have been required to maintain access control. According to Fort Ord Regulation 350-5 "Strict accountability will be maintained so that items cannot be buried or discarded to avoid returning unspent ammunition." To discourage the burial or discarding of unspent ammunition, ammunition was inventoried when checked out from the Ammo Supply Point (ASP), daily while stored in the field and again upon turn in of the unused ammunition at the ASP.

Fort Ord range regulations required that units be checked into and out of all bivouac areas. Joint inspections of the bivouac areas were conducted by the unit representative and a representative of Range Control prior to releasing the bivouac area from unit responsibility. All tactical digging or holes were to be filled in and all wire removed. All garbage (wet or dry) was to be hauled to the sanitary landfill for disposal or placed within dumpsters in the Main Garrison if the landfill was closed.

Although it is unlikely (for the reasons stated above) that unspent ammunition authorized for use in the bivouac areas would have been buried at Site OE-17, the possibility that burial did occur does exist. If the burial of spent ammunition occurred at Site OE-17, these items would not present a hazard if encountered.

3.17.5.2 Site Features

Site OE-17 was identified through interviews conducted as part of the ASR. The ASR describes a canyon having a firing point and target area with projectiles "fired from just east of the pond at a mound of dirt, covered with brush, in a westerly direction." The ASR also notes that the area was used for land mine training. Site walks were conducted by the USACE UXO Safety Specialist in 1995. Six practice mines (antitank and antipersonnel) were found and removed. The mines were found in two locations: two practice mines were found within Site OE-17, and four were found in a stream bed adjacent to Site OE-17. Other reports also indicate that practice mines have been found in the vicinity of Site OE-17. The area in and around Site OE-17 has been identified as a training and maneuver area since the mid-1950s (*Army, 1954*). A review of Fort Ord training facilities maps determined that the area was being used for Land Navigation from 1961 through 1976. From 1976 through base closure Training Site 19 is identified in this area. Range safety fans are not present in this area on any training maps.

3.17.5.3 Potential Sources and Location of OE

Site OE-17 was reportedly used in the 1960s as a target area for shoulder-launched projectiles (antitank) and as a land mine training area (*USAEDH, 1997*). Based on site use, the types of OE that may be expected include projectiles (57mm and 90mm), rockets (3.5-inch, 35mm, and 66mm), practice mines (M8 and M12), and fuzes (M604), explosive booby trap simulators (M117, M118, and M119), and firing devices (M1, M1A1, M3, and M5). Based on the design and use of the projectiles and rockets, they would normally be found at the surface. No evidence of the use of shoulder-launched projectiles (e.g., firing points, targets, fragments) was found at this site during sampling and site reconnaissance.

Practice mines may have been placed directly on the ground surface or buried at shallow depths and may still be present in the area. Firing devices and explosive booby trap simulators would also be expected on the ground surface or buried with mines at shallow depths.

OE scrap (illumination signal and booby-trap simulator) and live small arms blank ammunition that were found are consistent with site use as a troop training, maneuver and bivouac area. Two practice mines (AT and AP), were found within Site OE-17, and four practice mines were found near Site OE-17 during a site reconnaissance conducted by the USACE UXO Safety Specialist. Other practice mines have been found in the vicinity of Site OE-17 and are discussed further in Section 3.17.6.1. The presence of practice mines in this area is consistent with use of this area for practice mine training.

3.17.5.4 Potential Exposure Routes

This site is within land transferred to the BLM and is open to the public for hiking, biking, and horseback riding. Use is restricted to marked trails. The public has had access to this area for approximately 6 years. To date, no instances of OE items being found by the public in this area have been reported. Because no OE was discovered during sampling or reported previously, it is unlikely that OE exists at the surface in this area. However, because the site was not 100 percent investigated and OE scrap was found during sampling, the possibility exists that a recreational user could come into contact with surface OE. No evidence of the firing of direct fire or high trajectory weapons (e.g., shoulder fired or mortars) was found during sampling of this site.

Although no OE items were found at Site OE-17 a brief discussion of the potential injuries that could result from contact with practice mines and fuzes, booby trap simulators, activators and firing devices, and illumination signals are provided below. These items were selected for discussion, because scrap practice mines (M8 and M12), an expended booby trap simulator (M117), and an expended illumination

signal (M125) were found during site sampling or site reconnaissance, or may be present because of the type of training that occurred. For each of the OE items potentially remaining at the site, the following discussions provide information on: (1) how the item was designed to function, (2) the likelihood the item would function if found onsite and handled, and (3) the type of injury the item could cause if it functions.

Booby Trap Firing Devices. The firing devices shown in the table below are all issued with a coupling base firing device consisting of a metal or plastic body and an internal percussion primer (similar to the primer in a small arms cartridge), and are designed to be used to set up booby traps. They could also be used as a secondary firing device (booby-trap) for most anti-personnel and antitank mines. The firing devices could be set up to fire if a trip wire was pulled, pressure was released as in a weight being removed, or if a line under tension were cut. In each case, triggering the device would cause the spring-loaded firing pin to strike the percussion primer initiating the explosive train. As these items were used in training, no high explosives were used. The percussion primer provided sufficient noise to denote a detonation for training (*Army, 1981a*). It is unlikely that a set up booby trap, which includes one or more of the above firing devices would remain in operational condition after many years of exposure. These devices are not sealed units. They are designed to be set up in the field quickly to provide temporary area denial or separation of forces. Many booby trap firing devices require trip wires to activate them, which are composed of a thin wire that will not survive long in exposure to the elements. The firing devices themselves are not sealed to protect them from exposure to the environment. In the unlikely event that one of these armed devices were made to function they would likely produce a shock, noise, and flash. They are not likely to cause injury by themselves.

Nomenclature	Type by function	Lbs. Required to function
Firing Device, M1	Pull	3 to 5
Firing Device, M1	Pressure Release	3
Firing Device, M1 and M1A1	Pressure	20
Firing Device, M1	Chemical Delay	6 to 1130 minute delay
Firing Device, M3	Pull or Release	6 to 10 of Pull & any release of tension
Firing Device M5	Pressure Release	Approx. 5
Coupling Base, Firing Device, M2	Non-metallic	NA
Coupling Base, Firing Device	Metallic	NA

Summary: It is unlikely that a person through casual contact could cause an armed booby trap firing device fitted with a coupling base to function if one were found at the site, and be exposed to the shock, noise, and flash of the coupling base. Booby trap firing devices were designed to be functioned by a thin trip wire or release of pressure that would release a cocked spring loaded firing pin. These small,

unsealed metal parts have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Simulator, Explosive Booby-trap: Flash, M117; Illuminating, M118; Whistling, M119. The booby-trap simulators are designed to be used as safe booby traps during maneuvers and in troop training to teach the installation, detection and use of booby traps, and to instill caution in troops exposed to traps set by an enemy. They consist of a cylindrical outer tube (made of Kraft paper), and a flat metal nailing bracket extending from one end of the tube. Located within the outer tube are an initiating charge assembly and an inner tube containing a pyrotechnic charge. Running through the initiating assembly is a length of pull cord. One end of the cord is covered with a friction composition, the other end is coiled and a strip of tape. The M117 simulator has a dimple in the mounting bracket for additional identification at night. Issued with each simulator is a spool of tripwire, an extension spring, three staples, and four nails for booby trap installation. They were nailed against trees with a trip wire attached to the pull cord. It was functioned when a soldier applied pressure to the trip wire pulling the cord through the ignition composition assembly, which produces a flash. The flash is transmitted through a flash tube, which ignites the pyrotechnic charge (*Army, 1977b*). It is unlikely that a paper-bodied simulator would survive years of exposure in the field. In the unlikely event that an unfired simulator was discovered and functioned, the type of injuries that would be sustained would be burns and lacerations to the hand from the exploding pyrotechnic charge, if it was being held when it functioned.

Summary: It is unlikely that a person could cause a booby trap simulator to function through casual contact if one were found at the site and be burned or lacerated, because it was made from paper that would have been exposed to moisture, degradation, and weathering for many years, which could decrease its effectiveness.

Signals, Illumination, Ground, Clusters: Green Star, M125A1; Red Star, M158; White Star, M159. These signals were designed for daytime and nighttime signaling. Star cluster signals consist of 5-star illuminant assemblies and a rocket motor propulsion assembly combined in a hand-held aluminum launching tube. The base of the launching tube contains a primer and an initiating charge. As shipped, the firing pin cap is assembled to the forward end and must be reversed for firing. Stabilizing fins on the tail assembly of the rocket are folded parallel to the axis of the signal. A bolt, which also transfers the initiating charge flash to the propellant, extends into the center of the solid propellant, which fills the propulsion assembly. The illuminant assembly is mounted on top of the propulsion assembly with a delay assembly and an expelling charge between. It was functioned by striking the primer with the firing pin, which ignites the initiating charge to ignite the rocket propellant. As the rocket emerges from the tube, the fins unfold for flight stability. Before rocket motor burnout, at 200 feet, the black powder expelling charge is ignited performing a two-fold purpose of expelling and igniting the 5-star illuminant assemblies. Burn time is 6 to 10 seconds with burnout occurring at 250 to 300 feet above the ground (*Army, 1977b*). It is unlikely that incidental contact could cause a signal to function as the cap must be removed, placed over the base and struck sharply. If caused to function, the type of injury that could be sustained would be burns from the initiating charge and possibly the rocket motor.

Summary: It is unlikely that a person could cause a signal to function through casual contact if one were found at the site and be burned, because it: (1) would require precise placement of components and a hard blow to function, and (2) would have been exposed to moisture, degradation, and weathering for many years, which could- decrease the effectiveness of the components that cause it to function.

Antipersonnel Practice Mines (M8, M8A1) and Fuzes (M10, M10A1). The mine, antipersonnel, practice, M8 and M8A1 was designed to simulate the M2 (bounding) series of antipersonnel mines. They were used for training in the proper methods and precautions to be observed in the care, handling, laying,

booby-trapping, arming and disarming of the M2 and M15 series mines. The fuze firing mechanism is activated by applying pressure (8 to 20 pounds) on any of the three prongs on the M10 or M10A1 combination fuze, or a pull of 3 to 10 pounds of pressure on the trip wire. The fuze firing train ignites the delay element in the projectile and also propels it about 2 meters into the air. The delay initiates the spotting charge which explodes with a loud report and emits smoke (*Army, 1977a*). The M8A1 mine with the M10A2 fuze functions the same except that the fuze firing train ignites the yellow smoke pellets through a 4 to 5 second delay, expels a plastic plug into the air allowing the yellow smoke to be emitted from the top of the container (*Army, 1977a*). Assuming that a mine was left emplaced and armed, and that it survived many years of degradation from exposure, it could be functioned by incidental contact by applying sufficient pressure to any of the prongs or trip wire on the M10, M10A1, or M10A2 combination fuze by stepping upon the fuze or tripping on the trip wire. If caused to function, the type of injury that could be sustained from the M8 mine would be burns from the 170-grain black powder spotting charge, and possible injury from falling parts. If caused to function, the M8A1 would propel a plastic plug into the air allowing yellow smoke to be emitted from the container. Because the spotting charge is black powder, it will function if it dries out after being exposed to moisture.

Summary: It is unlikely that a person would be able to trigger the practice antipersonnel mine through casual contact if one were found at the site and be burned or exposed to smoke or falling parts, because the mine: (1) would have to contain a live fuze, and (2) these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Antitank Practice Mines (M12, M12A1, M20) and Fuzes (M604). The fuze, mine, antitank, practice (M604) was designed for use in the M12, M12A1, and the M20 antitank practice mines. The fuze is an instantaneous, mechanical, pressure-activated type fuze consisting of a steel body containing the firing pin assembly, cover assembly, primer and smoke charge and a safety fork. The fuze is issued separately and assembled to the mine in the field. After it is fired and the mine is recovered a new fuze can be installed and the mine reused. A minimum force of 140 to 240 pounds depressed the pressure plate that caused the Belleville spring to snap into reverse, driving the firing pin into the primer. The primer ignites the smoke composition, which flashes emitting a cloud of smoke and creating a noise. The primer contains 1.62 grains of primary explosive and 2.96 grains of black powder, and the smoke composition weighs 262.3 grains or 0.6 ounces (*Army, 1977a*). The mine was designed to be triggered by the weight of a vehicle, and would require more weight than a large person can apply by just stepping on the pressure plate to trigger it. If caused to function, the type of injuries that could be sustained would be a burn injury from the 262.3 grains of smoke composition.

Summary: It is highly unlikely that a person would be able to trigger a fuze through casual contact if one were found at the site and sustain a burn injury, because the fuze: (1) was designed to be triggered by the weight of a vehicle, and (2) would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

3.17.6 Site Evaluation

The available data (e.g., archival and reconnaissance data) regarding Site OE-17 were reviewed and evaluated according to procedures described in the Final Plan for Evaluation of Previous Work (*HLA, 2000*). The evaluation process is documented through the completion of a series of checklists. Copies of the checklist are provided as Attachment 17-A. This section presents a summary of the results of the checklist evaluation. It is divided into two sections, an assessment of the literature review and an assessment of the sampling performed at the site.

3.17.6.1 Literature Review

Type of Training and OE Expected

The 1961 through 1972 maps show that this site lies within the larger "Land Navigation Area." Review of historical maps does not indicate range fans associated with this area. A training area called RWO-6 is present on the 1964 Training Map, and is the only specific training area shown on maps. The site is identified on maps from 1976 through 1987 as "Training Site 19." Training Sites were used for overnight bivouac areas (*Army, 1980*). The 1976 through 1987 maps also show a helipad (Emergency Evacuation) just outside the northeast corner of the site boundary. It is possible that pyrotechnics items could have been used during training activities associated with the bivouac area.

This site, referred to as the AT Practice Mine Area in the ASR, was also reportedly used as a target area for shoulder launched projectiles. There is not any information available on the types of shoulder-launched projectiles that may have been used. According to interviews conducted as part of the ASR, this area was used in the 1960s. The canyon in this area had a firing point and target area for shoulder-launched projectiles, which were being fired from just east of the pond at a mound of dirt covered with brush, in a westerly direction. Two inert practice mines were also discovered when the area was investigated by the USACE UXO Safety Specialist. Other inert practice mines have also been found within training areas adjacent to Site OE-17.

Subsequent Use of the Area

The land that includes Site OE-17 was transferred to the BLM in 1996 and will remain undeveloped. The land is open to the public for recreational use such as hiking, biking, and horseback riding. To date no reports of mines found in Site OE-17 have been made; however, there have been two instances of BLM employees finding practice mines in areas adjacent to Site OE-17 (Plate 17-2). The inert training devices were reported to and removed by the USACE UXO Safety Specialist. A summary of the OE items found by BLM employees in the vicinity of Site OE-17 is provided in Table 17-2.

Establishment of Site Boundaries

Site OE-17 was identified from an interview, conducted by the USACE with Fort Ord personnel, as a location of training activities. Other adjacent training sites were also identified (Site OE-27S). Following the interviews and initial OE sampling of the site USACE personnel, including the UXO Safety Specialist, evaluated the area boundary using the sampling results, interview notes, site walk information, Fort Ord training maps, and aerial photographs. Based on the follow-up evaluation the Site OE-17 boundary was established as part of the archives search. No additional information was found as a result of the literature review to warrant changes to the current boundary of Site OE-17. Based on the literature review it is apparent that training activities also occurred in the area adjacent to Site OE-17 on the south side of Oil Well Road (Plate 17-2). The boundary of adjacent Site OE-27S (Training Site 19) was also established during the archive search. The 1997 ASR delineates Site OE-27S with a dashed boundary (establishing a general area of use) and recommends that Site OE-27S undergo site investigation and sampling.

Summary of Literature Review Analysis

Based on a review of site literature there was sufficient historical evidence to warrant sampling of this site. Training maps from the 1950s, 1960s, 1970s, and 1980s identify this area as the "Jack Ranger Station Training Area," a "Land Navigation Area" and as "Training Site 19." Interviews conducted with

Fort Ord personnel identified the area as a firing point and target area for shoulder-launched projectiles and as a land mine training area (*USAEDH, 1997*). No UXO was found during the geophysical sampling conducted within the Site OE-17 boundary. Inert practice mines have been found within Site OE-17 and adjacent to Site OE-17. The historical information suggests that Site OE-17 and the surrounding area were used for training using practice mines. Other than the interview records, no evidence that this site was used for the firing of shoulder-launched projectiles has been found.

3.17.6.2 Sampling Review

This section describes the items that were found at the site and how these items support historical information concerning past use of the site. Site boundaries are assessed in terms of the items found. There is also a discussion regarding sampling equipment, methods, and quality control measures used during prior OE sampling programs.

Sampling Results (Items Found)

Sampling was conducted at Site OE-17 in 1994. Two OE scrap items (illumination signal and booby-trap simulator) and live small arms blanks were found and removed. The two OE scrap items (illumination signal and booby-trap simulator) were found in Grids 3A and 9B, respectively. The illumination signal was a hand-held Model M125 type used for daytime or nighttime signaling (*Army, 1977b*). The booby-trap simulator was a Model M117 flash type used to teach troops the installation, detection, and use of booby traps (*Army, 1977b*). Additionally, live blank small arms ammunition (.30 cal, 5.56mm and 7.62mm) were found in Grids 1D, 6B, and 12A. All sample grids were placed within the site boundaries (Plate 17-2). There was no evidence found during sampling to suggest that this site was used as an impact area. A summary of the sample results for Site OE-17 is provided in Table 17-3.

Site Boundaries Review

A review of the sampling results indicates that the OE scrap and blank small arms rounds found were scattered throughout the site. Sample results indicate that Site OE-17 was part of a larger troop training and maneuver area. All grids sampled were completed within the Site OE-17 boundaries established by the USACE. Based on the results of the sampling no modification of the existing Site OE-17 boundaries is necessary, however, training areas adjacent to Site OE-17 may require additional OE-related investigation. The 1997 revised ASR recommended site investigation and sampling at adjacent Site OE-27S (*USAEDH, 1997*).

Equipment Review

UXB used the Schonstedt Models GA-52/C, GA-52/Cx, and the GA-72/Cv magnetometers to conduct the geophysical investigation of Site OE-17. These magnetometers are hand held and swung from side to side, generating a maximum search lane width of 5 feet. The Schonstedt instruments are passive dual flux-gate magnetometers -- highly sensitive magnetic locators that detect ferrous (iron) metal objects; however, they cannot detect non-ferrous metal objects (e.g., lead, brass, copper, aluminum). Magnetometers make passive measurements of the earth's natural magnetic field; ferrous metal objects (and rocks) are detected because they produce localized distortions (anomalies) in the magnetic field. The Schonstedt magnetometers actually detect slight differences in the magnetic field (the "gradient") by means of two sensors mounted a fixed distance apart within the instruments' staff. Because the magnetic response falls off (changes) greatly even over a short distance, a gradient magnetometer like the Schonstedt models listed above are especially sensitive to smaller, near-surface ferro-metal objects *(Breiner, 1973).*

The performance of the GA-52/C, GA-52/Cx, and GA-72/Cv was evaluated as part of the *Ordnance Detection and Discrimination Study (ODDS, Parsons Infrastructure & Technology Group Inc. [Parsons], 2001*). As part of the ODDS, studies were performed to evaluate:

- Signatures of inert OE items suspended in air at varying orientations and distances from the geophysical sensor (static tests).
- The ability of various geophysical instruments to detect and discriminate between different OE items buried at various depths (seeded tests).
- Geophysical instrument performance at actual OE sites (field trial site testing).

The Schonstedt tools were not evaluated during the static test; therefore, only the seeded test results and the field trial tests are discussed herein. It is recognized that the ODDS study areas may not represent the same field conditions as Site OE-17; therefore, differences in field conditions, if applicable, should be considered when using information from the ODDS.

During the seeded test, the Schonstedt Model GA-52/C located between 34 and 49 percent of the Type II and III items (90mm projectile, 3.5-inch, and 35mm subcaliber rockets) buried at depths up to the item's maximum calculated penetration depth. At the same depths, the Schonstedt Model GA-72/Cv located between 41 and 59 percent of the Type II and III items and the Schonstedt Model GA-52/Cx located between 39 and 74 percent of the Type II and III items. For non-penetrating Type I items (signal flares), between 56 and 67 percent were detected by the same instruments. The detection rate percentages assume a 5-foot wide search lane and vary according to the search radius used for the analysis (either 1.6 or 3.3 feet). Results for the 3-foot wide search lane were not included in the detection percentages presented above, because 3-foot search lanes were not used during the geophysical investigation of Site OE-17. A standard search radius for investigating anomalies was not specified in the OE contractor work plan or the after action report; therefore the detection ranges for the different search radii are presented above. These detection rates are considered conservative because in addition to the calculated penetration depth of the item, 1 foot was added to the depth to allow for the deposition of soil with time. Because the field conditions at the seeded test site and orientations of buried items may not be comparable to the Site OE-17 conditions, the results should be used to indicate that in general, the equipment is capable of detecting the same types of items at depths exceeding the items maximum calculated depth of penetration.

Mines were not specifically evaluated as part of the ODDS study, however, other surface items were evaluated. Therefore, for the purposes of comparison to the seeded and field trials tests, it is assumed that practice mines potentially discarded or left at Site OE-17 would be at the surface or potentially buried at depths of up to 2 feet below ground surface (bgs). As stated above, between 56 and 67 percent of the surface items would have been located by the instruments used at the site. However, unless obscured by vegetation it is expected that the detection of ordnance items lying on the ground surface should be 100 percent.

Results of the ODDS Field Trial Sites (FTS) were also reviewed for potential use in evaluating instrument performance at Site OE-17. Detection rates for each of the Schonstedt magnetometers were calculated for 4 of the 6 test sites; the remaining sites did not have enough OE detected to allow calculation of site statistics. The calculated detection rates for the combined sites ranged from 52 to 98 percent depending on the search radius used for the calculation. A standard search radius for investigating anomalies was not specified in the OE contractor work plan or the after action report; therefore the detection ranges for the different search radii (1.6 and 3.3 feet) are presented above. It should be noted that the ODDS field trial sites were selected to represent areas with high ordnance density. In comparison, Track 1 sites are

expected to have very low densities of OE scrap. Therefore, the field trial results may not be applicable to Track 1 sites.

Results of the ODDS field trials for the field test site closest in OE item density to Site OE-17 (FTS-3) were also reviewed. Five OE items were located during the investigation. No additional OE items were found during sifting of 10 percent of each grid (final Quality Control [QC] sampling). This indicates that it is unlikely that OE items would remain at FTS-3 within the grids sampled. Similar results could be expected at other sites, such as OE-17, after survey and clearance using the Schonstedt magnetometers.

Although not directly comparable to Site OE-17, the results of the ODDS indicate that all models of the Schonstedts used at this site are capable of detecting the ferrous surface and subsurface OE expected at this site. Small arms ammunition is non-ferrous and cannot be detected with a magnetometer.

Sampling Methods Discussion

Six 100- by 100-foot grids (approximately 1.4 acres) were sampled at Site OE-17 as part of the UXB sampling program. To provide maximum dispersion of the sample grids, the grids were spaced no closer than 200 feet from one another. Site perimeters and grid separation could be modified by the U.S. Army Corps of Engineers Huntsville Division (CEHND) Safety Specialist, if needed. Once sample grid locations were established each grid was divided into 5-foot wide search lanes. Each search lane was investigated visually while simultaneously searching for subsurface anomalies with the magnetometer. The sampling method used was 100 percent grid sampling, all magnetic anomalies detected were marked (flagged) and excavated using hand tools to a depth of 3 feet (*UXB, 1995a*). If the anomaly could not be uncovered within 3 feet of the surface the on-site CEHND Safety Specialist determined if deeper excavation was required. As noted above, only OE scrap and blank small arms ammunition were found. All OE scrap found was non-penetrating.

Quality Assurance/Quality Control

The Quality Assurance/Quality Control (QA/QC) procedures are described below.

Field Sampling

UXB conducted sampling at Site OE-17 from September 19, 1994 through September 26, 1994. QA/QC was performed throughout field sampling and is documented in the Site OE-17 Final After Action Report and the Final Primary Report (*UXB, 1995a and 1995b*). According to the reports, to insure that OE sampling was done properly, QC checks were performed by UXB QC specialists on each sample grid. QC checks were performed on 10 percent of each grid after all OE operations were complete. Sample grids were required to cover at least 10 percent of the total area of the site to be sampled. Following completion of the QC check, the CEHND Safety Specialist conducted a QA check. The QA check included a 10 percent check of the site (sample grid), using a Mark 26 Forester Magnetometer, prior to accepting it.

Magnetometers were inspected and tested daily to ensure that the magnetometers were operating within specification. A seeded test area was established by burying an inert (OE scrap) item (81mm mortar) at a depth of 4 feet. This area was used by teams to check their magnetometer and by the QC officer to randomly QC teams on their procedures (*UXB, 1995a*).

Data Management

Parsons, the current OE contractor, performed a 100 percent QC review of the data associated with the site. This review followed guidelines presented in the Standard Operating Procedures (SOP) provided as Appendix A. This review included a review of the database created by the OE contractor. The USACE followed the QC review with a 10 percent QA of the Parsons' data review. The requirements of the QA review are described in the USACE SOP provided as Appendix B in this report. The purpose of this review was to complete a 100 percent check of all available grid records to identify discrepancies between the after action report and the grid records. Discrepancies were then researched and corrections made, if appropriate, prior to loading the data into the project database. No discrepancies between the after action report and the grid records were identified for this site.

For this site, the following conclusions can be made regarding the quality of the data:

- The sample data collected by UXB are useful in providing information concerning the type of items present and in identifying areas where OE is not likely at Site OE-17
- Following sampling, UXB performed QC checks on at least 10 percent of each of the sample grids. Following completion of the QC, the CEHND Safety Specialist conducted a 10 percent QA inspection
- Depth information was not reported by UXB
- The location of any items found was reported within an accuracy of 5 feet, however, QC of the data indicates that the orientation of the grid in relationship to north and south was not documented resulting in a location accuracy that is to the grid only
- The quantity of non-OE scrap found was documented for each grid sampled
- No discrepancies between the after action report and the grid records were identified.

3.17.6.3 Preliminary Assessment

Reconnaissance Review

This section describes the items that were found during reconnaissance site investigation. One site reconnaissance has been conducted within and adjacent to Site OE-17. The reconnaissance consisted of a site walk conducted by the USACE UXO Safety Specialist. The object of the reconnaissance was to determine whether sites identified during the PA/SI conducted as part of the ASR required further action. The reconnaissance focused on the area around Site OE-17 and is identified as OE-27S (TS-19).

Reconnaissance Methods Discussion

The site reconnaissance conducted in 1995 was completed as part of the PA/SI phase of the ASR for known and suspected OE sites at the former Fort Ord. Several areas of potential ordnance use were identified based on information gathered during interviews conducted as part of the ASR. Two areas of possible ordnance use were identified on the south side of Jacks and Oil Well Road. The locations were identified as Site P and Site Q (Plate 17-2). Site P was reportedly used for land mine training in the 1960s. A portion of Site P partially overlaps Site OE-17, however, the majority of Site P lies to the south of Site OE-17. Site Q reportedly contained a firing point and a target area for shoulder-launched

projectiles. Site Q is located east of the northern end of Site OE-17A. Site reconnaissance of Sites P and Q was conducted by the USACE UXO Safety Specialist in November 1995. The reconnaissance included conducting a visual survey of the site with the aid of a hand-held magnetometer. The areas were searched randomly taking advantage of existing trails and open areas. Within Site P two practice landmines were found, a Model M8 antipersonnel and Model M12 antitank mines. These mines were found within a portion of Site P that overlaps Site OE-17. South of Site Q four practice antipersonnel mines were located (Model M8). All mines were inert, located below the ground surface and found with the assistance of the magnetometer. No other OE items were located during the reconnaissance at Sites P and Q. Due to the close proximity of Sites P and Q to residential neighborhoods and because these areas are accessible to the public, a Risk Assessment Code (RAC) score of 4 was assigned to Sites P and Q. A RAC score of 4 includes a recommendation of further OE-related action by the Ordnance and Explosives Mandatory Center of Expertise (MCX) and Design Center (CEHND). The need for further action at Sites P and Q (identified as OE-27S in the ASR) was based on the proximity of the site to the existing housing area and the increased probability of someone coming into contact with potential OE. The recommendation of further OE-related action was then forwarded to the CEHND for review. The CEHND reviewed the RAC worksheet and recommended site investigation and sampling at Site OE-27S (*USAEDH, 1997*).

Site Boundaries Review

During the site reconnaissance conducted at Sites P and Q, practice antitank and antipersonnel landmines were found. The practice mines found at Site P were found within a portion of Site P that lies within Site OE-17. As discussed previously, inert practice mines were also found near the site by employees of the BLM. Although no changes to the existing Site OE-17 boundary are necessary, the training areas adjacent to Site OE-17 may require additional OE-related investigation.

Quality Assurance/Quality Control

The site reconnaissance conducted as part of the PA/SI was performed in accordance with USACE guidance (*USACE, 1995).* The site reconnaissance is conducted to look for evidence of past ordnance use. Visible evidence found during the site reconnaissance provides information on the type, extent, and magnitude of ordnance present. Physical features that may be present at a former site include impact craters caused by penetrating ordnance, the presence of OE and/or OE scrap on the ground surface, and soil staining associated with the use of bulk explosives. Upon completion of the reconnaissance at each site a Risk Assessment Code (RAC) worksheet was completed and submitted to the Mandatory Center of Expertise (MCX) and Design Center (CEHND) as required (*USACE, 1995*).

3.17.7 Conclusions and Recommendations

The following section presents conclusions and recommendations for this site based on the review and analysis of data associated with historical information and sampling performed at the site.

3.17.7.1 Conclusions

Site Use

- On the basis of interviews, sample results, and site reconnaissance conducted in adjacent areas, Site OE-17 appears to have been used as a practice mine training area. No evidence of the use of high explosive mines was found within or nearby Site OE-17 during sampling or site visits. The area was reportedly used for the firing of shoulder-launched projectiles in the early 1960s (*USAEDH, 1997*).

However, no evidence of the use of shoulder-launched projectiles was found during sampling, site reconnaissance, or records review. A review of Fort Ord training maps indicates that Site OE-17 was also used for troop training and maneuvering from the 1950s through the 1980s.

- It appears that the practice mine area was larger than the Site OE-17 boundary as indicated by the presence of practice mines found during reconnaissance activities and by the BLM.

- This site is within land that is under the jurisdiction of the BLM and is to be maintained as habitat reserve. Since the reuse of the property that includes Site OE-17 will continue as habitat reserve, the encounter of OE by the recreational user is not likely.

- The following OE items, if present at the site, are considered to pose an acceptable risk if encountered for the following reasons:

  Booby Trap Firing Devices. It is unlikely that a person through casual contact could cause an armed booby trap firing device fitted with a coupling base to function if one were found at the site, and be exposed to the shock, noise, and flash of the coupling base. Booby trap firing devices were designed to be functioned by a thin trip wire or release of pressure that would release a cocked spring loaded firing pin. These small, unsealed metal parts have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

  Simulator, Explosive Booby-trap: Flash, M117; Illuminating, M118; Whistling, M119. It is unlikely that a person could cause a booby trap simulator to function through casual contact if one were found at the site and be burned or lacerated, because it was made from paper that would have been exposed to moisture, degradation, and weathering for many years, which could decrease its effectiveness.

  Signals, Illumination, Ground, Clusters: Green Star, M125A1; Red Star, M158; White Star, M159. It is unlikely that a person could cause a signal to function if one were found at the site and be burned, because it: (1) would require precise placement of components and a hard blow to function, and (2) would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

  Antipersonnel Practice Mines (M8, M8A1) and Fuzes (M10, M10A1). It is unlikely that a person would be able to trigger the practice antipersonnel mine through casual contact if one were found at the site and be burned or exposed to smoke or falling parts, because the mine: (1) would have to contain a live fuze, and (2) these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

  Antitank Practice Mines (M12, M12A1, M20) and Fuzes (M604). It is highly unlikely that a person would be able to trigger a fuze through casual contact if one were found at the site and sustain a burn injury, because the fuze: (1) was designed to be triggered by the weight of a vehicle, and (2) would have been exposed to moisture, degradation, and weathering for many years, which could decrease the effectiveness of the components that cause it to function.

Sampling Adequacy and Data Quality

- The Schonstedt Models GA-52/C, GA-52/Cx or the GA-72/Cv were used for all geophysical investigations. These instruments were evaluated as part of the ODDS and with the exception of small arms ammunition, are capable of detecting the type of items expected at this site. A numerical value for detection of items cannot be calculated for an individual site.

- Sampling and evaluation of previous work followed published work plans and SOPs.

- The data collected by UXB are useful in providing information concerning the type of items present at Site OE-17. The presence of an expended illumination signal and booby trap simulator is consistent with the types of items authorized for use in a practice mine training area and a bivouac area. The specific location of where these items were found was not provided so the accuracy of the location of the items found is to the sample grid only. Additionally, the depth at which the items were found was not recorded. However, all anomalies were excavated to a minimum depth of 3 feet.

- Although the previous OE sampling efforts performed at Site OE-17 are not consistent with requirements in place today, the quantity and quality of the available information is sufficient to make an informed decision regarding the site. The entire site was not sampled, however, the sampling methods were sufficient to confirm the types of OE items used. Additionally, because there was no OE found in previous investigations and the OE items potentially remaining at Site OE-17 pose an acceptable risk, further efforts to refine the site boundaries or conduct 100 percent sampling of the site would not add significantly to the understanding of the site or change the conclusions of this report.

3.17.7.2 Recommendations

Based on the review of existing data:

- It is not anticipated that OE remains at Site OE-17. However, additional evaluation is recommended to confirm this conclusion. This site should be retained in the Track 1 process.

- It is also recommended that the area adjacent to Site OE-17 (Site OE-27S and the portions of Sites P and Q that lie outside of Site OE-17) within which practice mines were located during reconnaissance and by the BLM, undergo additional investigation. Additional investigation and sampling were recommended for Site OE-27S in the ASR (*USAEDH, 1997*).

3.17.8 References

Arthur D. Little, Inc. (ADL), 1994. *Final Community Environmental Response Facilitation Act (CERFA) Report, Fort Ord, Monterey, California*. Real Estate Fort Ord (Military Reservation). April 1994.

Breiner, 1973. *Applications Manual for Portable Magnetometers.*

Greenhill Books, 2001. *The American Arsenal, The World War II Official Standard Ordnance Catalog of Small Arms, Tanks, Armored Cars, Artillery, Antiaircraft Guns, Ammunition, Grenades, Mine, etcetera*.

Hall, Thomas, 2003. *Comments on the Draft Track 1 Ordnance and Explosives Remedial Investigation/ Feasibility Study, Former Fort Ord, California*. February 25.

Harding Lawson Associates (HLA), 2000. *Final Plan for Evaluation of Previous Work Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. December 4.

_____, 1994. *Draft Final Data Summary and Work Plan, Site 39 – Inland Ranges, Fort Ord, California*. May 17.

IT Corporation (IT), 2001. *Basewide Range Assessment Work Plan and Contractor Quality Control Plan Small Arms and Multi-Use Ranges Fort Ord, California*. Revision C. January 26.

Parsons Infrastructure & Technology Group Inc. (Parsons), 2001. Draft Ordnance Detection and *Discrimination Study (ODDS), Former Fort Ord, Monterey, California*. August.

Stoner, Bob, 2002. Retired USN, Instructor/Chief Instructor (1977-1987), Gunnery School, Service School Command, Great Lakes, Illinois, personal communication with Jeffery Fenton, Harding ESE. June.

U.S. Army (Army), 1945, *Training Facilities, Fort Ord and Vicinity, California*. August.

_____, 1946. *Reservation Boundary and Land Use Map, 53-1-9-2* (Master Plan). April 5.

_____, 1954. *Training Areas That Cannot Be Used At Same Time: (As Presented In Use). Inclusion I to Appendix A to Annex O.* Circa 1954.

_____, 1956. *Map of Fort Ord Training Areas and Facilities.* December 20.

_____, 1957. *Map of Fort Ord Training Areas and Facilities.* July 15.

_____, 1958. *Map of Fort Ord Training Areas and Facilities.* January 10.

_____, 1964. *Field Training Areas & Range Map, Fort Ord. Appendix 2, Annex O.* April 27.

_____, 1965. *Boobytraps, Department of the Army Field Manual, FM 5-31*. September.

_____, 1967. *Back Country Roads, Field Training Area and Range Map, Fort Ord, California.* January.

_____, 1972. *Field Training Area and Range Map*. July 1.

_____, 1977a. *Technical Manual, Army Ammunition Data Sheets for Land Mines (FSC 1345), Department of the Army Headquarters, TM 43-0001-36.* February 14.

_____, 1977b. *Technical Manual, Army Ammunition Data Sheets: Military Pyrotechnics (Federal Supply Class 1370).* TM 43-0001-37. February.

_____, 1978. *Ranges and Training Area Overlay, Fort Ord and Vicinity*. January.

_____, 1980. *On Post Ranges and Training Areas. Fort Ord Regulation 350-5*. Department of Army. September 9, 1980.

_____, 1981a. *Technical Manual, Army Ammunition Data Sheets For Demolition Materials, TM 43-0001-38.* June.

_____, 1981b. *Technical Manual, Army Ammunition Data Sheets For Rockets, Rocket Systems, Rocket Fuzes, Rocket Motors (Federal Supply Class 1340). TM 43-0001-30.* December.

_____, 1983. *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat, AR 385-63*. October 15.

_____, 1987. *Ranges and Training Area Overlay, Fort Ord and Vicinity*. November 15.

_____, 2000a. *Mine/Countermine Operations, FM 20-32*. Chapter 13. 29 May.

_____, 2000b. *Grenades and Pyrotechnic Signals, FM 3-23.30. Chapter 5.* 1 September.

_____, 2001. *Light Antiarmor Weapons, FM 3-23.25.* Chapter 1 and 2. Date Accessed: March 20, 2002. http://www.adtdl.army.mil/cgi-bin/atdl.dll/fm/3-23.25/toc.htm August 30.

U.S. Army Corps of Engineers (USACE), 1961. *Basic Information, Training Facilities.* Revised as of 30 June 1961.

_____, 1968. *Training Facilities Map.* Engineer District Sacramento. March.

_____, 1972. *Training Ranges and General Road Maps*. Engineer District Sacramento. June 9.

_____, 1976. *Training Facilities Plan, Future Development, Master Plan*. December 1976.

_____, 1984. *Training Facilities Map, Basic Information Maps, Master Plan*. June.

_____, 1988. *Training Facilities, Master Plan, Fort Ord California*. May 2.

_____, 1995. *Procedures for Conducting Preliminary Assessments At Potential Ordnance Response Sites.* ETL 1110-1-165. April.

_____, 1997. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord California.* Sacramento District. April.

U.S. Army Corps of Engineers Huntsville, Division (USAEDH), 1993. *Archives Search Report, Fort Ord, California, Monterey County, California.* Prepared by U.S. Army Corps of Engineers St. Louis District. December.

_____, 1994. *Archives Search Report (Supplement No. 1) Fort Ord, California, Monterey County, California*. Prepared by U.S. Army Corps of Engineers St. Louis Division. November.

_____, 1995. *Ordnance and Explosives Center of Expertise (OE-CX) Interim Guidance (Draft ETL 1110-1-166). U.S. Army Corps of Engineers, Huntsville Center.* 5 September.

_____, 1997. *Revised Archives Search Report Fort Ord California, Monterey County, California.* Prepared by U.S. Army Corps of Engineers St. Louis Division. December.

UXB International Inc. (UXB), 1995a. *Final Report For Ordnance and Explosive Removal Action, Fort Ord, California, Primary Report.* November 1.

UXB, 1995b. *Final Report for Ordnance and Explosives Removal Action Fort Ord, California, Site 17.* November 1.

TABLES

Table 17-1. Sampling Operations, Site OE-17
Track 1 Ordnance and Explosive Remedial Investigation/Feasibility Study
Former Fort Ord, California

Site	Grid ID	Operation Type	Contractor	Geophysical Instrument Used	Grid Completion Date
OE-17 -- Anti-tank Practice Mine Area	OE-17_(01 D)	Sampling	UXB	SCHONSTEDT GA-72CV or GA-52CX	9/26/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(03 A)	Sampling	UXB	SCHONSTEDT GA-72CV or GA-52CX	9/22/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(06 B)	Sampling	UXB	SCHONSTEDT GA-52CX	10/13/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(09 B)	Sampling	UXB	SCHONSTEDT GA-72CV or GA-52C	9/26/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(09 B)	Sampling	UXB	SCHONSTEDT GA-72CV or GA-52C	10/12/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(12 A)	Sampling	UXB	SCHONSTEDT GA-72CV or GA-52C	9/21/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(12 A)	Sampling	UXB	SCHONSTEDT GA-72CV or GA-52C	9/22/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(12 A)	Sampling	UXB	SCHONSTEDT GA-52CX	10/11/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(12 A)	Sampling	UXB	SCHONSTEDT GA-52CX	10/12/1994
OE-17 -- Anti-tank Practice Mine Area	OE-17_(12 D)	Sampling	UXB	SCHONSTEDT GA-72CV or GA-52C	9/22/1994

Grid ID = Only the portion of the grid ID within parenthesis is posted on Plate 17-2.

Sampling = 100 percent of anomalies detected were excavated to a minimum depth of 4 feet. Deeper anomalies were pursued if directed by the USACE.

UXB = UXB international Inc.

Grid Completion Date = Work may have been conducted within a particular grid on more than one date.

Table 17-2. Incidental OE Scrap Found, Site OE-17 and Vicinity
Track 1 Ordnance and Explosive Remedial Investigation/Feasibility Study
Former Fort Ord, California

Site or Area	Activity	OE Items	Contractor	Status	Depth (in.)	Quantity	Date Found
Site P	Site Reconnaissance	Mine, antipersonnel practice, M8 Series	USACE	Inert	Not available	4	11/14/1995
Site OE-17	Site Reconnaissance	Mine, antipersonnel practice, M8 Series	USACE	Inert	Not available	1	11/15/1995
		Mine, antitank practice, M12	USACE	Inert	Not available	1	11/15/1995
Southeast of Site Q	Trail Maintenance	Mine, antipersonnel practice, M8 Series	BLM	Inert	0	1	6/17/1998
East of Site OE-27S	Trail Maintenance	Mine, antipersonnel practice, M8 Series	BLM	Inert	0	1	2/8/2000

Contractor = Organization reporting the OE item(s).

Note: A field with the annotation "not available" is a null field in the OE database.

Table 17-3. OE Scrap Found During Sampling, Site OE-17
Track 1 Ordnance and Explosive Remedial Investigation/Feasibility Study
Former Fort Ord, California

Site	Grid ID	OE Items	Status	Depth (in)	Quantity
OE-17 -- Anti-tank Practice Mine Area	OE-17_(03 A)	Signal, illumination, ground, M125 series	Inert	Not available	1
OE-17 -- Anti-tank Practice Mine Area	OE-17_(09 B)	Simulator, explosive boobytrap, flash, M117	Inert	Not available	1

Site = OE Site Number.
Grid ID = Grid where item was found. Only the portion of the grid ID within parenthesis is posted on Plate 17-2.
Status = Condition of item, either live or inert, inert indicates no OE hazard (i.e., OE scrap).
Depth = Inches below ground surface that the item was found.
Quantity = Number of like items.
Note: A field with the annotation "not available" is a null field in the OE database.

ATTACHMENT 17-A

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 1: LITERATURE REVIEW

TYPE OF TRAINING AND OE EXPECTED

	Yes	No	Inconclusive
1. ***Is there evidence that the site was used as an impact area (i.e., fired OE such as mortars, projectiles, rifle grenades or other launched ordnance)?***	Yes		

Sources reviewed and comments
The Archives Search Report (ASR) states that according to interviews, in the early 1960s this canyon had a target area for shoulder launched projectiles. The projectiles were fired from just east of the pond at a mound of dirt, covered with brush, in a westerly direction. Review of historical maps does not indicate range fans associated with this area. No pond is evident in the 1966 or 1999 aerial photographs. Disturbed ground is evident in both photographs. This area was used for Land Navigation Training as shown in maps from 1961 through 1972. The 1964 map labels the site as "Land Navigation RWO 6". The 1967 map shows a helipad just outside the northeast corner of the site boundary. The 1968 map shows an aviation training area in the same location.

2. ***Is there historical evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?***	Yes		

Sources reviewed and comments
Interview records indicate potential use of HE or LE items. Explosive boobytrap simulator (LE) and blank small arms ammunition found during sampling. ASR, USAEDH 1997; Review of Fort Ord facilities and training maps, After Action Report - UXB, 1995.

3. ***Is there historical evidence that training involved use of pyrotechnic and/or smoke producing items (e.g., simulators, flares, smoke grenades) but not explosives?***	Yes		

Sources reviewed and comments
The site is referred to as the Antitank (AT) Practice Mine Area. Interview records indicate that an inert AT mine was pulled out of the ground in this area by an EOD sergeant. The area was also investigated by an UXO Safety Specialist. Two inert AT mines were discovered. These mines appear to have been discovered outside the site boundaries based on the coordinates given. Other training areas have included the use of pyrotechnics.

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 1: LITERATURE REVIEW

	Yes	No	Inconclusive

DEVELOPMENT AND USE OF THE SURROUNDING AREA

4. *Does subsequent development or use of the area indicate that OE would have been used at the site?*		No	

Sources reviewed and comments
The area is open space and under the jurisdiction of the BLM. No subsequent development has occurred. BLM maintenance crews have reported finding practice mines near the site.

5. *Does use of area surrounding the site indicate that OE would have been used at the site?*	Yes		

Sources reviewed and comments
BLM maintenance crews have reported finding practice land mines in the area. Area is open space and has been open space throughout use of the base. The area has been assigned as training areas for various units throughout history including division artillery in 1956, 1st Brigade in 1958, and as Training Area H in 1988.

ESTABLISHMENT OF SITE BOUNDARIES

6. *Is there evidence of training areas on aerial photographs that could be used to establish boundaries?*		No	

Sources reviewed and comments
Disturbed area and buildings are present on aerial photograph but not a defined training area. No evidence of pond mentioned under response to question 1.

7. *Is there evidence of training on historical training maps that could be used to establish boundaries?*	Yes		

Sources reviewed and comments
Training area RWO-6 from 1964 training map overlaps part of the site. Adjacent training areas are larger that the site boundaries and could be used to help define a slightly larger site boundary.

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 1: LITERATURE REVIEW

	Yes	No	Inconclusive
8. *Should current boundaries be revised?*		No	

Sources reviewed and comments
Results of the literature review do not indicate that the boundary should be revised.

RESULTS OF LITERATURE REVIEW

Does the literature review provide sufficient evidence to warrant further investigation?		No	

Comments
No further investigation indicated by the results of the literature review. Areas adjacent to Site OE-17 where practice mines were found may require additional OE-related investigation.

References
USAEDH, 1997. Revised Archives Search Report, Former Fort Ord, California, Monterey County, California. Prepared by US Army Corps of Engineers St. Louis District.
UXB, 1995. Final Report for Ordnance and Explosives Removal Action Fort Ord, California Site 17. November 1.
Maps
1956, Fort Ord Training Areas and Facilities, December 20.
1958, Map of Fort Ord Training Areas and Facilities. January 10.
1961, Map of Fort Ord Training Areas & Facilities. Revised June 30.
1964, Field training Areas and range Map, April 27.
1967, Back Country Roads, January.
1968, Training Facilities Map, Basic Information, March.
1972, Training Ranges and General Road Maps. June 9.

ATTACHMENT 17-A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 2: RECONNAISSANCE EVALUATION

	Yes	No	Inconclusive
1. ***Is there evidence that the site was used as an impact area (i.e., fired OE such as mortars, projectiles, rifle grenades or other launched ordnance)***		No	

Sources reviewed and comments
Site walk resulted in the discovery of 6 inert antitank and antipersonnel practice mines found within and outside the site boundary. No evidence of launched ordnance was found during the reconnaissance (USACE, 1995b and 1995c).

2. ***Is there evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?***		No	

Sources reviewed and comments
No. Only inert practice mines were found (USACE, 1995b and 1995c).

3. ***Is there evidence that training involved use of pyrotechnic and/or smoke producing items (e.g., simulators, flares, smoke grenades) but not explosives?***	Yes		

Sources reviewed and comments
The site is referred to as the Antitank (AT) Practice Mine Area in the ASR. Six inert AT and AP mines were discovered by the USACE UXO Safety Specialist during a site walk conducted as part of the ASR (USACE, 1995b and 1995c). It is possible that simulators (smoke producing) were employed during mine training.

4. ***Does subsequent development or use of the area indicate potential that OE would have been used at the site?***		No	

Sources reviewed and comments
The area is open space and under the jurisdiction of the BLM. Only development that has occurred is trail system. BLM maintenance crews have reported finding practice mines near the site (Incidents dated 6/17/98 and 2/8/2000).

ATTACHMENT 17-A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 2: RECONNAISSANCE EVALUATION

	Yes	No	Inconclusive
5. ***Does use of area surrounding the site indicate that OE would have been used at the site?***	Yes		

Sources reviewed and comments
The area is open space and under the jurisdiction of the BLM. Only development that has occurred is trail system. BLM maintenance crews have reported finding practice mines near the site (Incidents dated 6/17/98 and 2/8/2000).

6. ***Is there evidence of training areas on aerial photographs that could be used to establish site boundaries?***		No	

Sources reviewed and comments
Disturbed area and buildings are present on aerial photographs from 1966 and 1999. Much of the area is covered with vegetation, so it is not possible to develop boundaries entirely from aerial photographs.

7. ***Is there evidence of training on historical training maps that could be used to establish boundaries?***	Yes		

Sources reviewed and comments
Training area RWO-6 from 1964 training map overlaps part of the site. Adjacent training areas are larger than the Site OE-17 boundaries and could be used to help define a slightly larger site boundary.

8. ***Was reconnaissance performed within appropriate area?***	Yes		

Sources reviewed and comments
Comparison of maps prepared during reconnaissance and historical training area maps indicate the area covered as part of the reconnaissance was within the historical training areas (USACE, 1995b and 1995c).

ATTACHMENT 17-A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 2: RECONNAISSANCE EVALUATION

	Yes	No	Inconclusive
9. ***Does reconnaissance indicate OE and/or ordnance-related scrap are present at the site?***	Yes		

Sources reviewed and comments
OE scrap found adjacent to the site. Six inert practice mines were identified within and outside the site boundaries during reconnaissance in the area. RAC recommends further investigation along Jacks Road (USACE, 1995b and 1995c).

10. ***Were the type(s) of items found consistent with the type of training identified for the site?***	Yes		

Sources reviewed and comments
This area was identified as a Antitank (AT) Practice Mine Area with possible area for shoulder launched projectile firing (USACE, 1997). Review of RAC sheet indicates only practice mines were found.

11. ***Were the type(s) of items found consistent with the era(s) in which training was identified?***	Yes		

Sources reviewed and comments
Mines identified as M-8 and M-12 were in use in the 1960s and 1970s (Army, 1977).

12. ***Was HE fragmentation found?***		No	

Sources reviewed and comments
Review of RAC sheet did not indicate any HE was present. Only items located were the 6 inert AT and antipersonnel (AP) mines found (USACE, 1995b and 1995c).

13. ***Was HE found?***		No	

Sources reviewed and comments
See response to question 12.

14. ***Was LE found?***		No	

Sources reviewed and comments
See response to question 12.

ATTACHMENT 17-A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 2: RECONNAISSANCE EVALUATION

	Yes	No	Inconclusive
15. *Were pyrotechnics found?*		No	

Sources reviewed and comments
See response to question 12.

	Yes	No	Inconclusive
16. *Were smoke producing items found?*		No	

Sources reviewed and comments
Not specifically mentioned, however, some mines include a fuze ignited smoke charge to indicate functioning of the mine (Army, 1977)

	Yes	No	Inconclusive
17. *Were explosive items found (e.g. rocket motors with explosive components, fuzes with explosive components)?*		No	

Sources reviewed and comments
Only the inert mines were found (USACE, 1995b and 1995c).

	Yes	No	Inconclusive
18. *Do items found in the area indicate training would have included use of training items with energetic components?*			Inconclusive

Sources reviewed and comments
Possible fuzes for mines

	Yes	No	Inconclusive
19. *Were items found in a localized area (possibly the remnants of a cleanup action)?*		No	

Sources reviewed and comments
One to four mines found at each location, buried or on the surface (USACE, 1995b and 1995c and incidents dated 6/17/98 and 2/8/2000).

	Yes	No	Inconclusive
20. *Is it appropriate to divide the site into sectors to focus on areas of common usage, similar topography and vegetation, and/or unique site features?*		No	

Sources reviewed and comments
Does not seem appropriate at this site.

ATTACHMENT 17-A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 2: RECONNAISSANCE EVALUATION

	Yes	No	Inconclusive
21. ***Should site boundaries be revised?***		No	

Sources reviewed and comments
No, however, additional OE-related investigation may be required in adjacent areas.

	Yes	No	Inconclusive
22. ***Has the field data been collected and managed in accordance with quality control standards established for the project?***	Yes		

Sources reviewed and comments
The site reconnaissance conducted as part of the ASR was performed in accordance with USACE guidance (USACE, 1995a).

Result of Reconnaissance Evaluation

	Yes	No	Inconclusive
Does the reconnaissance evaluation provide sufficient evidence to warrant further investigation?		No	

Comments
No further OE-related investigation of Site OE-17 necessary based on the results of the reconnaissance review. However, additional OE-related investigation may be warranted in areas adjacent to Site OE-17 where reconnaissance and BLM employees located additional practice mines.

References
Department of the Army (Army), 1977. Technical Manual, Army Ammunition Data Sheets For Land Mines (FSC 1345). February.
U.S. Army Corps of Engineers (USACE), 1995a. Procedures for Conducting Preliminary Assessments At Potential Ordnance Response Sites. ETL 1110-1-165, April.
_____, 1995b. Risk Assessment Procedures For Ordnance And Explosive Waste (OEW) Sites (RAC Sheet), Site Q, November 14.
_____, 1995c. Risk Assessment Procedures For Ordnance And Explosive Waste (OEW) Sites (RAC Sheet), Site P, November 15.
_____, 1997. Draft Revised Archives Search Report, Fort Ord, California, Monterey County California. Prepared by the USACE, St. Louis District.

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 3: SAMPLING EVALUATION

	Yes	No	Inconclusive
1. ***Is there evidence that the site was used as an impact area (i.e., fired OE such as mortars, projectiles, rifle grenades and other launched ordnance)?***		No	

Sources reviewed and comments
Sampling results do not indicate the area was used as an impact area. Items found were 1 Signal, illumination, ground, M125 type and a Simulator, explosive boobytrap, M117 type. 94 small arms blank rounds were also found (UXB, 1995).

	Yes		
2. ***Is there evidence that training involved use of High Explosive (HE) or Low Explosive (LE) items?***			

Sources reviewed and comments
Explosive boobytrap simulator (UXB, 1995).

	Yes		
3. ***Is there evidence that training involved use of pyrotechnic and/or smoke producing items (e.g., simulators, flares, smoke grenades) but not explosives?***			

Sources reviewed and comments
Sampling results indicate that pyrotechnic and simulators were used. Items found were 1 Signal, illumination, ground, M125 type and a Simulator, explosive boobytrap, M117 type. 94 small arms blank rounds were also found (UXB, 1995).

	Yes		
4. ***Was sampling performed within the appropriate area?***			

Sources reviewed and comments
Site OE-17 lies within a portion of the probable training area (USACE, 1997; Army, 1956, 1958, 1961, 1964, 1967, 1968, and 1972).

	Yes		
5. ***Does sampling indicate OE and/or ordnance-related scrap are present at the site?***			

Sources reviewed and comments
Illumination signal and boobytrap simulator (UXB, 1995).

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 3: SAMPLING EVALUATION

	Yes	No	Inconclusive
6. ***Were the type(s) of items found consistent with the type of training identified for the site?***	Yes		

Sources reviewed and comments
The explosive boobytrap simulator is consistent with a practice mine training area (USACE, 1997), however no evidence found to support the use of shoulder launched projectiles (UXB, 1995). Army, 1956, 1958, 1961, 1964, 1967, 1968, and 1972

7. ***Were the type(s) of items found consistent with the era(s) in which training was identified?***	Yes		

Sources reviewed and comments
Mines identified as M-8 and M-12 were in use in the 1960s and 1970s (Army, 1977).

8. ***Was HE fragmentation found?***		No	

Sources reviewed and comments
No HE fragmentation was found at the site (UXB, 1995).

9. ***Was HE found?***		No	

Sources reviewed and comments
No HE was found at the site (UXB, 1995).

10. ***Were LE found?***		No	

Sources reviewed and comments
OE Scrap only (UXB, 1995)

11. ***Were pyrotechnics found?***		No	

Sources reviewed and comments
OE Scrap only (UXB, 1995).

12. ***Were smoke producing items found?***		No	

Sources reviewed and comments
No smoke producing items were found (UXB, 1995).

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 3: SAMPLING EVALUATION

	Yes	No	Inconclusive
13. ***Were explosive items found (e.g. rocket motors with explosive components, fuzes with explosive components)?***		No	

Sources reviewed and comments
OE Scrap only (UXB, 1995).

	Yes	No	Inconclusive
14. ***Do items found in the area indicate training would have included use of training items with energetic components?***	Yes		

Sources reviewed and comments
Ground illumination signal and an explosive boobytrap simulator (UXB, 1995).

	Yes	No	Inconclusive
15. ***Were items found in a localized area (possibly the remnants of a cleanup action)?***		No	

Sources reviewed and comments
No, items distributed throughout the site (UXB, 1995).

	Yes	No	Inconclusive
16. ***Has the site been divided into sectors to focus on areas of common usage, similar topography and vegetation, and/other unique site features?***		No	

Sources reviewed and comments
The site was not divided into sectors based on past usage or site features (UXB, 1995).

	Yes	No	Inconclusive
17. ***Should current site boundaries be revised?***		No	

Sources reviewed and comments
No boundary revision warranted on the basis of the sample results (UXB, 1995).

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 3: SAMPLING EVALUATION

	Yes	No	Inconclusive
18. ***Was equipment used capable of detecting items suspected at the site at the maximum expected depth?***	Yes		

Sources reviewed and comments
Land mines are non-penetrating and were listed as NA on the penetration analysis (USAESCH, 1997). For the purposes of comparison to the ODDS seeded and field trials tests, it is assumed that land mines potentially discarded or left at Site OE-17 would be at the surface (Type I) or potentially buried at depths of up to 2 feet bgs. Schonstedt Models GA-52/C, GA-72/Cv, and GA-52/Cx magnetometers were used during sampling (UXB, 1995). The results of the ODDS study indicate that the magnetometers used at this site are capable of detecting the ferrous OE expected at this site.

19. ***Was equipment used capable of detecting the types of items (e.g., non-ferrous) suspected at the site?***	Yes		

Sources reviewed and comments
Schonstedt models GA-52/C, GA-72/Cv, and GA-52/Cx were used (After Action Report - UXB, 1995a). These instruments are capable of detecting ferrous items only, however, non-metallic items were not expected based on the literature review.

20. ***Do the results of the ODDS indicate that items suspected at the site would have been detected by the instrument used at the time of investigation?***	Yes		

Sources reviewed and comments
Although not directly comparable to Site OE-17, the results of the ODDS indicate that all models of the Schonstedts used at this site are capable of detecting the ferrous OE (Type I, II, and III) expected at this site. Small arms ammunition is non-ferrous and cannot be detected with a magnetometer. These detection rates are considered conservative because in addition to the calculated depth of the item, 1 foot was added to the depth of penetration to allow for the deposition of soil with time (Parsons, 2001).

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 3: SAMPLING EVALUATION

	Yes	No	Inconclusive
21. ***Do results of the investigation indicate that suspected items could be detected with a high level of confidence at observed and expected depth ranges?***	Yes		

Sources reviewed and comments
Based on the ODDS study, the Schonstedt models used at the site are capable of detecting the OE expected at this site (Parsons, 2001).

22. ***Were all the instruments used to evaluate the site maintained and calibrated in accordance with associated work plan and manufacturer's specifications?***	Yes		

Sources reviewed and comments
As stated in the After Action report, "Each magnetometer was tested each morning and field tested after lunch to determine that it was operating correctly," (UXB, 1995)

23. ***Based on the appropriate target density (UXO items per acre) has the minimal amount of sampling acreage been completed in accordance with the scope of work or contractor work plan?***	Yes		

Sources reviewed and comments
"Sample grids were required to cover at least 10% of the total area of the site to be sampled" (UXB, 1995). No UXO was detected; therefore, UXO density cannot be calculated.

24. ***Based on sampling procedure (e.g., grids, transects, and/or random walks) was a percentage of the site completed to provide 95% confidence in a UXO density estimate, and if so provide total area investigated and the UXO density estimate.***			Inconclusive

Sources reviewed and comments
Six 100x100-foot grids, 60,000 square feet, (approximately 1.4 acres) were sampled by UXB (15% of the site). Expended illumination signal (ground), expended explosive boobytrap simulator and small arms (UXB, 1995).

Total Area: 60,000 square feet
UXO Density: Not calculated

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 3: SAMPLING EVALUATION

	Yes	No	Inconclusive

25. *What percentage of the anomalies were intrusively investigated?*

Sources reviewed and comments
"Every magnetic anomaly was marked and excavated" (UXB, 1995). 96 anomalies identified.

Total % of anomalies investigated	100%

26. *Was the appropriate data processing scheme used for the site, how was the data processed?*

		NA

Sources reviewed and comments
Not applicable. No digital geophysical data was collected.

27. *Has the field data been collected and managed in accordance with quality control standards established for the project?*

Yes		

Sources reviewed and comments
Quality Control "(QC) checks were performed on each grid after all UXO operations were complete. UXB QC specialists checked a minimum of 10 percent of each grid to insure that OE removal was done properly. After this QC check the CEHND Safety Specialist performed a QA check of the site prior to accepting it." After Action Report - UXB, 1995

Result of Sampling Evaluation

Does the sampling evaluation provide sufficient evidence to warrant further investigation?

	No	

Comments
Based on the sample results further investigation within the current boundaries of Site OE-17 is not warranted.

ATTACHMENT 17 - A
EVALUATION OF PREVIOUS WORK: SITE OE-17
EVALUATION CHECKLIST PART 3: SAMPLING EVALUATION

	Yes	No	Inconclusive

References

Parsons, 2001. Draft Ordnance Detection and Discrimination Study (ODDS), Former Fort Ord, Monterey, California. August.

USACE, 1997. Revised Archives Search Report, Former Fort Ord, California, Monterey County, California. Prepared by US Army Corps of Engineers St. Louis District.

UXB, 1995. Final Report for Ordnance and Explosives Removal Action Fort Ord, California Site 17. November 1.

Maps

1956, Fort Ord Training Areas and Facilities, December 20.

1958, Map of Fort Ord Training Areas and Facilities. January 10.

1961, Map of Fort Ord Training Areas & Facilities. Revised June 30.

1964, Field training Areas and range Map, April 27.

1967, Back Country Roads, January.

1968, Training Facilities Map, Basic Information, March.

1972, Training Ranges and General Road Maps. June 9.

PLATES