GROUP 2

MRS-27F (BIVOUAC AREA), MRS-45A (TACTICAL TRAINING AREA) AND MRS-59B (UNNAMED)

CONTENTS

TABLES

PLATES

FIGURE (In Text)

ATTACHMENTS

3.0 GROUP 2 - MRS-27F (BIVOUAC AREA), MRS-45A (TACTICAL TRAINING AREA) AND MRS-59B (UNNAMED)

Information supporting the determination of MRS-27F, MRS-45A, and MRS-59B as Track 1 Plug-In sites is presented below. This approval memorandum consists of two main parts. The first part, contained in Sections 3.1 through 3.4, 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 munitions response investigations, and development of a conceptual site model. The above-mentioned information was used to support the second part of this report, which is the Site Evaluation (Section 3.6). The Site Evaluation was conducted in accordance with the procedures described in the *Final Plan for Evaluation of Previous Work* (*Harding Lawson Associates [HLA], 2000b*) and may restate some information presented previously. The Site Evaluation discusses the evaluation of the literature review process (Section 3.6.1), evaluation of sampling process(es) (Section 3.6.2), and evaluation of the site walk process (Section 3.6.3). These discussions are based upon information from standardized literature review and sampling review checklists (Attachment G2-1). Section 3.7 provides conclusions and recommendations for the site. References are provided in Section 3.8.

3.1 Site Description

MRS-27F (Training Site 6) comprises approximately 10 acres and is located in the northeastern portion of the former Fort Ord, near the East Garrison (Plate 1). MRS-27F lies mostly within MRS-59 and a portion lies within MRS-59B (approximately 0.9 acres). The southern portion of MRS-27F lies on land that was transferred to the Bureau of Land Management (BLM) in 1996 (Plate G2-1). The northern portion of MRS-27F was retained by the Army and will be transferred at a later date. The evaluation of the portion of MRS-27F that overlaps the southwestern corner of Parcel L20.2.3.1 is included in the evaluation of MRS-59B.

MRS-45A (Tactical Training Area) comprises approximately 0.8 acre and is located in the northeastern portion of the former Fort Ord, west of the East Garrison and to the south of Inter-Garrison Road (Plate G2-1). MRS-45A was originally part of MRS-45, but for the purposes of property transfer and the MEC evaluation, MRS-45 was subdivided. MRS-45A overlaps small portions of Parcels L20.2.2 and L35.4 (approximately 0.5 and 0.3 acres, respectively).

MRS-59B (an unnamed site) comprises approximately 8 acres and is located in the northeastern portion of the former Fort Ord, near the East Garrison. MRS-59B overlaps approximately 8 acres of Parcel L20.3.2.1 (Plate G2-1). MRS-59B was originally part of MRS-59, but for the purposes of property transfer and the MEC evaluation, MRS-59 was subdivided as follows: MRS-59, MRS-59A, and MRS-59B (Plate G2-2). The portion of MRS-59 that lies to the south of Parcel L20.2.3.1 was transferred to the Bureau of Land Management (BLM) in 1996. The property that included the remainder of the MRS-59 footprint (MRS-59A and MRS-59B) was retained by the Army and was to be transferred at a later date. MRS-59A was recently evaluated for the presence of MEC in the Track 1 OE RI/FS (*MACTEC, 2004*). Based on the review of existing information, MEC is not expected to be found at MRS-59A, and in accordance with the Track 1 ROD, no further action related to MEC is required for this site (*Army, 2005a*).

3.2 Site History and Development

The following presents a summary of the site histories 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

MACTEC. 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 has also resulted in misalignments of some map features with respect to the aerial photographs.

Pre-1940s Era

This group of sites lie within a tract of land purchased from private landowners by the government in 1917 (*Arthur D. Little, Inc. [ADL], 1994*). Documentation of the pre-1940s era use of this area by the Army for training is limited to 1918, 1933, and 1938 topographic maps of the area and a late 1930s aerial photograph. The 1918 map did not indicate training in this area (*Department of the Interior [DOI], 1918*); however, the 1933 (*Army, 1933-34*) and 1938 (*Army, 1938*) topographic maps show Camp Ord was developed and located approximately 1,700 feet to the east of MRS-45A (Plate G2-2). Camp Ord was used as an encampment and a training and maneuver area, primarily for 11th Cavalry and the 76th Field Artillery stationed at the Presidio of Monterey, prior to the establishment of Fort Ord. Small arms ammunition firing ranges associated with Camp Ord were located to the southeast of MRS-45A and to the northeast of MRS-59B with firing directed toward the south. None of the targets associated with these ranges were located within Site OE-59B.

1940s Era

Review of 1940s documentation and aerial photographs indicates that a series of small arms ammunition firing ranges (e.g., Known Distance Range, and rifle and pistol ranges) are present to the northeast of MRS-59B (*Army, 1941, 1945, and 1946a*). A target bunker from one of the ranges (Known Distance Range) lies adjacent to the site. No other portions of the small arms firing ranges were within MRS-59B. More specific information is provided below:

- The 1945 training facilities map indicates that MRS-45A and MRS-59B are within an area identified as "E-south". The specific type of training that occurred in this area is not identified on the map. No other 1940s training areas were identified within MRS-45A.

- An area identified as "Combat Ranges 1, 2, 3" is located to the south of MRS-45A (*Army, 1945*). The eastern portion of Combat Range 1 overlaps a portion of MRS-59B and MRS-27F. The specific type of training that occurred at the Combat Ranges is not known.

1950s Era

Review of 1950s era documentation including training maps, aerial photographs, and other Fort Ord maps indicates that the Known Distance Ranges were no longer in use and were labeled as "inactive" on the circa 1954 map (*Army, 1954*). The pistol ranges and small bore rifle ranges were still active. The following summarizes the results of the 1950s historical map and aerial photograph review:

- The area adjacent to MRS-59B (to the east) is assigned to the 759th Tank Battalion (*Army, 1954*). The only feature identified within the area assigned to the 759th is a "Bayonet Training Area".

- Most of the area that includes MRS-45 and MRS-59B was assigned to the 11th Infantry and were being used for Tactical Training. MRS-45 was identified as a Tactical Training Area in the Fort Ord Archives Search (Site OE-45; *USAEDH, 1997*).

- A 1956 training map identified a "Tank Driving Area" within the area assigned to the 759th Tank Battalion (*Army, 1956*). No range fans associated with the Tank Driving Area or the area assigned to the 759th Tank Battalion are delineated on the training facilities maps and it is not expected that this area was used for the firing of tank weaponry (*MACTEC, 2004*).

- In 1957, the area that includes MRS-59B was assigned to the 3rd Brigade (*Army, 1957*). No specific training activities are identified within the MRS-59B boundary. The mission of the 3rd Brigade was to conduct basic combat training (*Army, 1968*).

- Beginning in 1958, the area that includes MRS-45A and MRS-59B was assigned to the 4th Brigade. The mission of the 4th Brigade was to conduct combat support training (e.g., basic Army administration, food service, basic unit supply, field communications, and light wheel vehicle driving) (*Army, 1968*).

1960s era

Throughout the 1960s the area that includes MRS-45B was assigned to the 4th Brigade. The small arms ammunition firing ranges, identified as East Garrison (EG) Range 1, EG-2, and EG-3, were present to the northeast of MRS-59B (Plate G2-3). None of the firing points or targets associated with these ranges were located within MRS-59B (*Army, 1961, 1964b, 1967, and 1968*). Specific training areas noted within or near MRS-45A and MRS-59B include a Non-Commissioned Officers Academy (NCOA; *Army 1961, 1964b*) and Division Support Services (DSS; *Army, 1967; USACE, 1968*).

1970s era

Review of the 1970s training maps indicates that the area was assigned to the 4th Brigade throughout the 1970s. The East Garrison Ranges were still present and remained active during this time. More specific information is provided below:

- By 1972, PG&E gas and electrical transmission lines are constructed. The lines run across Fort Ord and pass through MRS-45 and MRS-59. The area that includes MRS-45A and MRS-59B are within the 4th Brigades Training and Maneuver Area and include the DSS Training Area.

- In 1976, Training Sites MRS-27E and MRS-27F are present and identified as TS-5 and TS-6, respectively. These areas were used as overnight Bivouac Areas. A third training site, Training Site 7, is in the vicinity of MRS-59B. Training Site 7 was used as a repelling area. These training sites are shown in the same approximate locations from the mid 1970s through base closure.

1980s era

The only training areas identified in the vicinity of the sites are Training Sites 5, 6, and 7. The East Garrison small arms firing ranges were present to the north of MRS-59B from the 1980s until base closure.

Proposed Future Land Use

These sites are currently undeveloped. MRS-27F lies mostly within land transferred to the BLM and is open to the public for recreational use. MRS-59B, the remaining portion of MRS-27F, and a portion of MRS-45A are on undeveloped property that is designated as a habitat corridor with limited development. The remaining portion of MRS-45A lies within a habitat corridor that is restricted from future development (*USACE, 1997*).

3.3 Potential Military Munitions Based on Historical Use of the Area

No evidence has been found to suggest that these sites were used for anything other than a troop maneuver and bivouac area. Information gathered during site investigation activities indicates that small arms ammunition, simulators, practice munitions (including mines and hand grenades), smoke producing and pyrotechnic items (illumination signals) may have been used at these sites. The MEC and munitions debris items found in the vicinity of the sites are presented on Plate G2-2. A review of range control files (DUD records) included the incomplete entry for an item reportedly located within Training Site 6 (MRS-27F). The records indicate the number of items found as "1", the location as "TS-6", and the name of the explosive ordnance disposal (EOD) person that was informed of the discovery. No other information on this report was provided.

3.4 History of Munitions Response Investigations

The following presents a summary of Fort Ord munitions response-related reports and investigations concerning the site.

1997 Revised 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. The archives search was conducted in accordance with U.S. Army Corps of Engineers guidance (*USACE, 1995*). 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 archives search are described in Section 2.4 of the Final Track 1 OE RI/FS (*MACTEC, 2004*).

MRS-59 (now subdivided into MRS-59, MRS-59A, and MRS-59B) was identified during interviews conducted during the PA/SI phase of the Fort Ord Archives Search (Site OE-59; *USAEDH, 1997*). The area (identified as area K10 during the interview) reportedly included a 2.36-inch rocket range in the early 1940s (Plate G2-2). The site was reportedly not active after this time and the interviewee had no first-hand knowledge of the range. Munitions that may have been used at area K10 were reported to have been 2.36-inch rockets.

MRS-27F (located within MRS-59), also identified during the archives search, was one of a number of training sites that were used as overnight bivouac areas. A site walk was conducted in 1996 by a USACE UXO Safety Specialist. The reconnaissance of MRS-59, which included MRS-27F, involved walking portions of the sites and sweeping the path walked using a Schonstedt Model GA-52/Cx magnetometer (Plate G2-4). Expended pyrotechnic items and two pieces of mortar fragments from the incomplete detonation of a 60mm mortar were found (*USAEDH, 1997*). The two pieces of mortar fragments were found to the southwest of MRS-59B and MRS-27F, on the far west side of MRS-59. The specific location of the expended pyrotechnics was not identified. No evidence was found within MRS-59B or MRS-27F to support their use as impact areas (e.g., fragmentation, fuzes, or projectiles). Only expended pyrotechnic items were found (*USAEDH, 1997*). On the basis of the reconnaissance performed, the ASR recommended further site investigation and random sampling at MRS-59 (*USAEDH, 1997*). No other munitions response investigations have been conducted at MRS-59B.

MRS-45 was identified during the Fort Ord archives search as a former Tactical Training Area (*USAEDH, 1997*). As discussed in Section 3.2, MRS-45A was originally part of MRS-45, but for the purposes of property transfer and the MEC evaluation, MRS-45 was subdivided. During an initial site

walk of the eastern portion of MRS-45, a grenade fuze was found southwest of the water tank located on Parcel L35.4. It was not noted if the grenade fuze was MEC or munitions debris. A follow-up site walk performed by a USACE UXO Safety Specialist identified a "dud Mark II practice grenade and an inert Mark I practice grenade" (*USAEDH, 1997*).

Investigations by USA Environmental (USA/CMS)

Several sampling and removal investigations were conducted within the Group 4 sites by CMS Environmental, Inc. (CMS) and USA Environmental (USA). In June 1998, CMS was purchased by USA Environmental, which became the company responsible for conducting the military munitions investigations at the former Fort Ord. For the purpose of clarity, USA will be referenced as having conducted the work at these sites. Contract requirements for the USA work are described in the Track 1 OE RI/FS (*MACTEC, 2004*).

In 1997, CMS (USA) conducted sampling using the SiteStats/GridStats (SS/GS) sampling program at MRS-45 (*USA, 2001*). SS/GS statistically calculates the number of grids and the percentage of anomalies at a site that require sampling. Further discussion of the SS/GS sampling method is provided in Section 3.6.3. According to the After Action Report eighty-six operating grids of various sizes were sampled. Portions of two of the grids (TC-2 and TC-3) were located within MRS-45A (Plate G2-3). According to the CMS work plan, the sample grids were surveyed using a maximum 5-foot search lane with a Schonstedt Model GA-52/Cx magnetometer. Both grids measured 100- by 200-feet in size (20,000 square feet). A total of 245 anomalies were identified in grid TC-2 and a total of 83 anomalies were identified in grid TC-3. Because the SS/GS grid sampling approach was used, 68 of the 245 anomalies in grid TC-2 were excavated (27.7%) and 26 of the 83 anomalies in grid TC-3 were excavated (31.3%). Using the SS/GS sampling approach, the other 234 anomalies were not investigated. No MEC or munitions debris were found in Grids TC-2 or TC-3. Table G2-1 summarizes the sampling effort for the sample grids that were partially within MRS-45A. According to the After Action Report, no evidence was found during sampling that would indicate that MRS-45 was ever used as an impact area. With the exception of a HE hand grenade fragment and two grids where unknown fragments were found, no evidence of high explosive munitions were encountered and all MEC and munitions debris that was found in MRS-45 was pyrotechnic or training in nature (*USA, 2001*). All fragments found within MRS-45 were located approximately one-half mile or more west of MRS-45A.

Investigations for the Basewide Range Assessment (BRA)

Portions of MRS-27F, MRS-45A, and MRS-59B were also investigated as part of the BRA for small arms and multi-use ranges. The assessment of MRS-27F, MRS-45A, and MRS-59B for potential hazardous and toxic waste related to military munitions included a literature search, site reconnaissance, and mapping of the sites. Under the BRA, MRS-27F was identified as HA-138, MRS-45 (which included MRS-45A) was identified as HA-175, and MRS-59 (which included MRS-59B) was identified as HA-189. Additionally, a former range (Known Distance Range) located to the north of MRS-27F and MRS-59B was also investigated. The Known Distance Range was identified as HA-77. Each site reconnaissance was conducted by a two-person team that included a military munitions specialist and a second team member trained in munitions recognition. Prior to conducting the site reconnaissance, historical features were identified from training maps and aerial photographs and their locations entered into a GPS unit (way-points). The team then conducted the site visit navigating to the way-points. The path of the site walk was recorded digitally with a GPS unit. The following features or items were required to be mapped if present based on a visual search of the site as part of the BRA reconnaissance: (1) targets; (2) firing lines; (3) range fan markers; (4) survey bench marks; (5) areas of stained soil that could indicate petroleum hydrocarbon or bulk explosives contamination; (6) MEC or munitions debris; (7) potential sample locations based on: (a) the presence of spent ammunition (lead) (accumulations of 1

to 10 percent and areas exceeding 10 percent), or (b) accumulations of MEC or munitions debris; (8) other training related features (e.g., fighting positions, fox holes, etc.); and (9) areas of thick vegetation that could limit access to the investigation area.

The reconnaissance at HA-189 was conducted in 2001. The reconnaissance of HA-189 included walking through and around MRS-59B and MRS-27F (Plate G2-4). No evidence of MEC-related items, small arms ammunition, or targets were observed. One fighting position was noted. Access to the southern portion of HA-189 (within MRS-59) was limited to trails and roads due to dense vegetation. No targets locations or concentrations of military munitions were found at HA-189.

The reconnaissance at HA-175 was conducted in 2001. The reconnaissance of HA-175 included walking throughout MRS-45 and adjacent to MRS-45A (Plate G2-4). No evidence of MEC-related items, small arms ammunition, or targets were observed. Several fighting positions were located to the west of MRS-45A, within MRS-45. No evidence of a range or concentrated areas of military munitions were found within HA-175.

The reconnaissance at HA-138 was conducted in 2001. The reconnaissance of HA-138 included walking through the central portion of MRS-27F (Plate G2-4). No evidence of MEC-related items, small arms ammunition, or targets were observed. No evidence of a range or concentrated areas of military munitions were found within HA-138.

Areas adjacent to MRS-27F and MRS-59B have also undergone site walks under the BRA including HA-77 and HA-137. The reconnaissance at HA-77 (Known Distance Range) was conducted in 2001. The reconnaissance of HA-77 included walking adjacent to MRS-59B, throughout MRS-59 and through the central portion of MRS-27F (Plate G2-4). Spent small arms ammunition was observed in a few locations and follow-up soil samples were collected. No MEC, munitions debris, or evidence of military training were identified during the reconnaissance or sampling.

The reconnaissance of HA-137 (MRS-27E) was conducted in 2001. The reconnaissance of HA-137 included walking throughout MRS-27E and some surrounding areas (Plate G2-4). No evidence of MEC-related items, small arms ammunition, or targets were observed. No evidence of a range or concentrated areas of military munitions were found within HA-137.

Investigations by Parsons

To address the potential threat to the public posed by the potential presence of MEC on the ground surface, a series of Time Critical Removal Actions (TCRAs) were completed by Parsons within areas adjacent to BLM-managed recreational land and other publicly accessible areas that are adjacent to sites where MEC had been located in the past. MRS-45 and MRS-45A were included in the TCRA because the surface removal could be performed without the use of geophysical equipment and no vegetation was removed (*Parsons, 2002*). The field crews walked open areas and trails visually searching for MEC and munitions debris. Any MEC or munitions debris that was encountered was removed or destroyed. Only areas that were relatively clear of vegetation were searched (Plate G2-4). The field crews used PDAs and GPS to record site data, navigate the site, and record the locations of any MEC and munitions debris that was observed. No MEC or munitions debris was found within MRS-45A or in the portion of MRS-45 adjacent to MRS-45A (*Parsons, 2002*).

3.5 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 MEC 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 MEC), and exposure routes (potential scenarios that may result in contact with MEC).

The CSMs developed for the Group 2 sites are based on currently available site-specific and general information including the Phase I EE/CA (*USACE, 1997*), ASR (*USAEDH, 1993*), Draft Final Literature Review Report (*HLA, 2000a*), review of aerial photographs, training maps, sampling results, field observations, and technical manuals. The CSMs were developed to help evaluate the adequacy of the investigation completed to date and to identify potential release and exposure pathways. Plates G2-5, G2-6, and G2-7 present the conceptual site models.

3.5.1 Training Practices

Training practices are discussed below to provide information on the potential types and distribution of military munitions that may have been used at the site, and the potential areas of concern remaining at the site, if any.

Bivouac Area Training

Bivouac areas at Fort Ord were used for overnight training and field exercise. One bivouac area (MRS-27F) had been established in 1976, and partially overlaps the current footprint of Parcel L20.2.3.1 (Plate G2-5). A second bivouac area (MRS-27E) was located immediately adjacent to Parcel L20.2.3.1. Use of the bivouac areas at Fort Ord is documented in Fort Ord Range Regulation 350-5 (*Army, 1980*). The storage of ammunition was not allowed within 100 feet of a bivouac area. Normally, blank cartridges, simulators, pyrotechnics, and smoke items were the only items allowed for storage 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*). The burial of trash or garbage was prohibited. To discourage the burial or discarding of unspent ammunition, it 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 a Range Control representative inspect the bivouac areas after each use (*Army, 1980*).

Training and Maneuver Areas

A training and maneuver area may have included using the site for squad patrols. Infantry platoons and squads conduct three types of patrols: reconnaissance, combat, and tracking (*Army, 1992*). Each patrol includes specific objectives using infantry troops, sometimes with engineer support, to gather information and conduct simulated combat operations. Combat patrols would include the use of blank small arms ammunition, and possibly pyrotechnics and smoke producing items (e.g., signals, flares, and smoke grenades). Specific areas identified within and in the vicinity of MRS-45A and MRS-59B include a Training and Maneuver Area, NCOA training, and a tactical training area. Although no direct evidence was found, and no indications were observed, that would identify the type of military munitions that may have been used at MRS-45A and MRS-59B, various practice and pyrotechnic items including a simulator, illumination signals and flares, practice grenades, and mines (munitions debris) were found in the vicinity of the sites suggesting that these areas may have been used for general training activities.

3.5.2 Site Features

These sites lie in the northeastern portion of the former Fort Ord to the west and southwest of the East Garrison. These sites are moderate to heavily vegetated with poison oak, grass, manzanita, and oak trees. MRS-27F and MRS-59B are located within relatively flat terrain. MRS-45A is located near the top of a low hill in an area of gently sloping terrain.

3.5.3 Potential Sources and Location of MEC

No MEC or munitions debris were found during the sampling that occurred within MRS-45A. Munitions debris was found during the walk of MRS-59, but the exact location of the items was not specified and it is not known if any of the items were found within either MRS-27F or MRS-59B. However, because of the nature of the activities identified on training maps, and because munitions debris and some MEC have been found in the vicinity of MRS-27F and MRS-59B, these items are described below. Based on the review of the data, the types of military munitions that might be expected at this site include smoke-producing items, pyrotechnics, practice mines, and simulators. These items by design are non-penetrating and would be expected to be present at or near the ground surface. No evidence of the use of 2.36-inch rockets or an impact area at MRS-59B (or MRS-59 and MRS-59A) was found during the historical review or reconnaissance of the site. Practice antitank mines could still be present at MRS-45A. Some practice mines and/or their fuzes contain a pyrotechnic charge or a smoke producing increment. These mines would likely have been buried shallowly. To be conservative and for comparison to other studies, the depth of burial was assumed to be up to 1 foot bgs (below ground surface).

3.5.4 Potential Exposure Routes

Access to MRS-27F, MRS-45A, and MRS-59B is currently unrestricted. MRS-45A lies to the south of Inter-Garrison Road and adjacent to an aboveground water storage tank that is maintained by the Marina Coast Water District (Parcel L35.4). MRS-59B is adjacent to land transferred to the BLM, which is open to the public for recreational use. Most of MRS-27F lies within BLM land. Potential exposures to MEC, although unlikely, could result from encountering practice mines and mine fuzes, booby trap firing devices, illumination signals, simulators, and practice and smoke producing hand grenades. It should be noted that no MEC or munitions debris have been found within MRS-27F, MRS-45A or MRS-59B. The items mentioned above are non-penetrating by design and with the exception of practice mines and the associated booby trap firing devices, would be expected to be present at or near the ground surface.

For each of the MEC items potentially remaining at the sites, 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. Additional details on these items are presented in the Final Track 1 OE RI/FS (*MACTEC, 2004*).

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 25 or more years, which could decrease the effectiveness of the components that cause it to function.

Grenade, Hand, Smoke, M18. The M18 is a colored smoke hand grenade used for ground-to-air or ground-to-ground signaling. The grenades may be filled with any one of four smoke colors: red, green, yellow, or violet. Each grenade will emit smoke for 50 to 90 seconds. The grenade body is of thin sheet metal and is filled with smoke composition and topped with a starter mixture. The hand grenade fuze M201A1 is a pyrotechnic delay igniting fuze. The body contains a primer, first-fire mixture, pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, striker spring, safety lever, and safety pin with pull ring. The grenade weighs 19 ounces and contains 11.5 ounces of smoke composition. It was functioned when a soldier removed the safety pin from the safety lever and threw the grenade allowing the safety lever to fly free, releasing the spring-loaded striker to strike the primer. The percussion primer ignited the first fire mixture. The fuze delay element, which burns for 0.7 to 2 seconds, ignition mixture, and grenade starter mixture and filler, are ignited by the preceding component. The pressure sensitive tape is blown off the emission holes from which the colored smoke emits (*Army, 1977c*). Assuming an M18 smoke grenade was discovered in an unfired condition and caused to function, the type of injuries that could be sustained would be burns from the burning smoke composition. Due to the heat generated, it is unlikely that a person who found a grenade and caused it to function would hold onto it after ignition. Given that these items have been exposed to the elements for many years, moisture can penetrate and degrade the pressure sensitive tape, the smoke composition, and the condition of the sheet metal case of the grenade.

Summary: It is possible that a person could cause the smoke grenade to function if one were found at the site and be burned, but it 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.

Simulator, Projectile, Air Burst: M74A1 and M74. The projectile simulates artillery fire air bursts. They consist of a one-piece aluminum case with an extracting rim, and resemble a large shotgun shell. The case contains a percussion primer mounted in the base, a black powder propelling charge, a delay fuse, and an inner case containing a flash charge. The simulator is fired from Pyrotechnic Pistol AN-M8. The firing pin of the pistol strikes the primer, igniting the propelling charge. The propelling charge expels the self-contained flash charge from the case, at the same time igniting the igniting charge. The igniting charge ignites the delay fuse, and the fuse in turn, ignites the flash charge producing a bright flash and a loud noise. The total delay from actuation of the firing pin to ignition of the flash charge is 2 to 3 seconds. Aimed at a 45-degree elevation, the height of burst is about 100 feet (*Army, 1977b*).

Summary: It is unlikely that a person could cause an airburst projectile simulator to function through casual (inadvertent or unintentional) contact if one were found at the site and be injured, because it would require a hard, precise blow to the primer to function. If an airburst projectile simulator is found at the site and subjected to an open flame (i.e., fire), it may function and could cause nonfatal burns and/or lacerations.

Antipersonnel Practice Mines (M8, M8A1) and Fuzes (M10, M10A1). Mines, antipersonnel, practice, M8 and M8A1 were 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. 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 may still be capable of functioning 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 (inadvertent or unintentional) 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 Light Mine M10, and Fuze M604. The M10 antitank practice mine consists of a rectangular steel container that is loaded with sand in the field. According to Headquarters Munitions Command data cards, the M10 antitank practice mine was produced between 1946 and 1947. A primary fuze well for the practice fuze is located in the top center of the mine. The fuze (M604) is designed for use in the M10, M12, M12A1, and the M20 antitank practice mines. It 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. The smoke charge is contained in the fuze. The M10 practice mine can be booby trapped with a regular firing device threaded directly into the secondary fuze well. Functioning of the fuze ignites a smoke charge that emits a cloud of smoke and creates a noise. When booby trapped, the mine is activated by a pull wire (*Army, 1977a, b*).

Summary: It is highly unlikely that a person would be able to trigger a practice antitank mine through casual (inadvertent or unintentional) contact if one were found at the site and be exposed to smoke and noise, because the mine: (1) would have to contain a live practice fuze and active practice detonator, (2) was designed to be triggered by the weight of a vehicle, and (3) these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

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 by pressure on the device 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, 1981*). 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 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.

Figure G2-1. Booby Trap Firing Devices and Related Components

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
Activator, Antitank Mine, Practice M1	Triggered by firing device	NA

Summary: It is unlikely that a person through casual (inadvertent or unintentional) 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, pressure, 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 trip wire, an extension spring, three staples, and four

nails for booby trap installation. They are nailed against trees with a trip wire attached to the pull cord. It is functioned when a soldier applies 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, 1977a*). 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 (inadvertent or unintentional) 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.

3.6 Site Evaluation

The available data (e.g., archival and reconnaissance data) regarding MRS-45A, MRS-27F, and MRS-59B were reviewed and evaluated according to procedures described in the *Final Plan for Evaluation of Previous Work* (*HLA, 2000b*). The evaluation process is documented through the completion of a series of checklists. Copies of the checklist are provided as Attachment G2-1. 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 MRS-45A.

3.6.1 Literature Review

Type of Training and Military Munitions Expected

MRS-27F – This training site is first identified on a 1976 Ranges and Training Area Overlay map and was one of 25 training sites identified on training facilities maps. Use of this area appears to have continued until at least 1987 (Training Site 6). The area that includes this site was previously used for general training and maneuvers, including tactical training, NCOA training, and combat support training. According to Fort Ord Range Regulation 350-5, bivouac areas at Fort Ord were used for overnight training and field exercise (*Army, 1980*). One of the 25 training sites was randomly chosen to survey for the presence of military munitions. The items found during the survey included grenade safety levers, a grenade fuze (M201A1) and expended blank small arms ammunition cartridge cases. The Archives Search Report recommended that Training Site 6 "undergo additional sampling as part of overall site investigation" (*USAEDH, 1997*).

MRS-45A – MRS-45A was originally part of MRS-45, but for the purposes of property transfer and the MEC evaluation, MRS-45 was subdivided. Discussions of MRS-45 that follow include MRS-45A. MRS-45 was identified during the review of training facilities maps conducted as part of the Fort Ord Archives Search (*USAEDH, 1997*). It was identified as a Tactical Training Area on training facilities maps in the mid-1950s (*Army, 1954 and 1956*). Specific site boundaries for the Tactical Training Area were not shown on the training maps. MRS-45A overlaps small portions of Parcels L20.2.2 and L35.4 (approximately 0.5 and 0.3 acres, respectively).

MRS-59B - As part of the Archives Search, an interview was conducted with Mr. Fred Stephani. Mr. Stephani served as a Fort Ord fire fighter from 1942 to 1944 at which time he left the Fort Ord fire department and joined the Army. Mr. Stephani returned to the Fort Ord fire department in 1947 where he worked until he retired, as Fire Chief, in 1978. During the interview, Mr. Stephani stated that the area (identified during the interview as K10) was used in the early 1940s and included a 2.36-inch rocket range (*USAEDH, 1997*). The site was reportedly not active after this time and the interviewee had no first hand

knowledge of the range. Area K10 was identified in the Archives Search Report as Site OE-59 (now MRS-59). MRS-59 was later subdivided into MRS-59, MRS-59A, and MRS-59B. The rocket range was apparently located immediately to the west of MRS-59A and to the south of MRS-59B. A review of 1940s era training maps did not identify a 2.36-inch rocket range in the vicinity of MRS-59B, MRS-59A or MRS-59. A reconnaissance (site walk) was performed as part of the ASR by a USACE UXO Safety Specialist. No evidence of a 2.36-inch rocket range was found.

These sites lie in areas that were previously used as a tactical training area, a bivouac area, combat support training, and NCOA training. The expected types of military munitions associated with these activities include practice mines, pyrotechnics (including signals and flares), simulators, smoke grenades, firing devices, and fuzes. Details regarding these types of training and munitions are presented in Section 3.4. Other training that may have occurred in this area includes use as a combat range and a 2.36-inch rocket range. MRS-27F and MRS-59B lie near or within an area identified on a 1945 map as Combat Range 1. The specific type of training that occurred at this location is not known. With the exception of fragments from the incomplete detonation of a 60mm mortar found in the southwest portion of MRS-59, only practice and non-penetrating military munitions items have been found during site walks that have been conducted in the areas surrounding MRS-27F and MRS-59B.

Subsequent Use of the Area

The areas that include MRS-27F, MRS-45A, and MRS-59B remain undeveloped. Land immediately adjacent to MRS-27F and MRS-59B (Parcel F1.2) was transferred to the BLM and is open to the public for recreational use including hiking, biking, and horseback riding. The land adjacent to MRS-45A is also accessible to the public. An aboveground water storage tank was constructed on land adjacent to MRS-45A. The water storage tank is maintained by Marina Coast Water District personnel.

Establishment of Site Boundaries

The boundary of MRS-27F was determined based on the evaluation of training facilities maps that was conducted during the Fort Ord archives search. The boundary of MRS-27F was based on a training site boundary (Training Site 6) that was shown on training maps from the mid 1970s through the mid 1980s.

MRS-45A was originally part of MRS-45, but for the purposes of property transfer and the MEC evaluation, MRS-45 was subdivided. The boundary of MRS-45 was also determined based on the evaluation of training facilities maps completed as part of the Fort Ord archives search. The area was identified as a Tactical Training Area on a circa 1954 training map and a 1956 training map.

MRS-59B was originally a part of MRS-59, but for the purpose of property transfer, MRS-59 was subdivided into MRS-59, MRS-59A, and MRS-59B. The boundary of MRS-59 was developed during interviews conducted as part of the archives search. A general area of use (area K10) was identified as a possible 2.36-inch rocket range in the early 1940s (Plate G2-2). The location identified was a general area of potential activities and was not surveyed or based on specific knowledge of the site or training procedures. Following the interview USACE personnel, including a UXO Safety Specialist, evaluated the area boundary using the interview notes, site walk information, Fort Ord training maps, and aerial photographs. Based on the follow-up evaluation, the MRS-59 boundary was established.

Summary of Literature Review Analysis

These sites lie in areas that were previously used as a tactical training area, a bivouac area, combat support training, and NCOA training. The expected types of military munitions associated with these activities include practice mines, pyrotechnics (including signals and flares), simulators, smoke grenades,

firing devices, and fuzes. Details regarding these types of training and munitions are presented in Section 3.4. Other training that may have occurred in this area includes use as a combat range and a 2.36-inch rocket range. MRS-27F and MRS-59B lie near or within an area identified on a 1945 map as Combat Range 1. The specific type of training that occurred at this location is not known. With the exception of fragments from the incomplete detonation of a 60mm mortar found in the southwest portion of MRS-59, only practice and non-penetrating military munitions items have been found during site walks that have been conducted in the areas surrounding MRS-27F and MRS-59B.

3.6.2 Reconnaissance Review

This section describes the various site reconnaissance activities that have been conducted within MRS-27F, MRS-45A, and MRS-59B. The discussion includes the site reconnaissance method, results of the site reconnaissance, a discussion of the military munitions (if found), and QA/QC. Site reconnaissance activities that have been performed within these sites include a PA/SI completed as part of the Archives Search, site walks completed as part of the BRA, and a site walk that included a visual sweep for potential military munitions laying on the ground surface. The paths of the site reconnaissance performed for the various investigations are provided on Plate G2-4.

Reconnaissance Methods Discussion

Preliminary Assessment

As part of the PA/SI phase of the Fort Ord Archives Search of known and suspected munitions response sites, a reconnaissance was conducted by a USACE UXO Safety Specialist in 1996 that included portions of MRS-27F and adjacent MRS-59 (Plate G2-4). Several areas where military munitions were potentially used were identified based on information gathered during interviews conducted as part of the PA/SI. One of the areas identified in those interviews was an area that reportedly included a 2.36-inch rocket range in the early 1940s (Site OE-59; *USAEDH, 1997*). A USACE UXO Safety Specialist walked a portion of the site visually searching the path walked while simultaneously searching for subsurface military munitions using a magnetometer. The area walked included MRS-27F and adjacent sites MRS-59 and MRS-59A (Plate G2-4). The only MEC found were fragments from a partially detonated 60mm mortar that were located on the western side of MRS-59. No evidence of projectile fuzes or projectile cases were observed within MRS-27F and adjacent MRS-59 and MRS-59A. Expended pyrotechnics and small arms ammunition were also found during the reconnaissance; however, their specific location was not identified. No evidence of other types of training or use as an impact area was identified as a result of reconnaissance. The model numbers of the expended pyrotechnics found by the USACE UXO Safety Specialist are not identified. Due to the potential hazard associated with the presence of the 60mm mortar fragments found on the western side of MRS-59, the USACE UXO Safety Specialist assigned a Risk Assessment Code (RAC) score of 4 to MRS-59. A RAC score of 4 includes a recommendation of further MEC-related action by the Ordnance and Explosives Mandatory Center of Expertise (MCX) and Design Center (Army Corps of Engineers Huntsville Division [CEHND]). The recommendation of further MEC-related action was then forwarded to the CEHND for review. The CEHND reviewed the RAC worksheet and recommended further site investigation and random sampling (*USAEDH, 1997*).

Basewide Range Assessment

Portions of MRS-27F, MRS-45A, and MRS-59B were investigated as part of the BRA for small arms and multi-use ranges. Under the BRA, MRS-27F was identified as HA-138, MRS-45 (which included MRS-45A) was identified as HA-175, and MRS-59 (which included MRS-59B) was identified as HA-189. Additionally, a former range located to the north of MRS-27F and MRS-59B was also investigated. The Known Distance Range was identified as HA-77. The assessment focused on the evaluation for potential

hazardous and toxic waste related to military munitions, and included a literature search, site reconnaissance and mapping of the sites.

The reconnaissance at HA-138 was conducted in 2001. The reconnaissance of HA-138 included walking through the central portion of MRS-27F (Plate G2-4). Because no evidence of a range or concentrated areas of military munitions were found within HA-138, no further action related to chemical contamination was recommended for HA-138 under the Fort Ord BRA (*MACTEC/Shaw, 2005*).

The reconnaissance at HA-175 was conducted in 2001. The reconnaissance of HA-175 included walking throughout MRS-45 and adjacent to MRS-45A (Plate G2-4). Because no evidence of a range or concentrated areas of military munitions were found within HA-175, no further action related to chemical contamination was recommended for HA-175 under the Fort Ord BRA (*MACTEC/Shaw, 2005*).

The reconnaissance at HA-189 was conducted in 2001. The reconnaissance of HA-189 included walking through and around MRS-59B and MRS-27F (Plate G2-4). Because no targets locations or concentrations of military munitions were found at HA-189, no further action related to chemical contamination was recommended for HA-189 under the Fort Ord BRA (*MACTEC/Shaw, 2005*).

Areas adjacent to MRS-27F and MRS-59B have also undergone site walks under the BRA including HA-77 and HA-137. The reconnaissance at HA-77 (Known Distance Range) was conducted in 2001. The reconnaissance of HA-77 included walking adjacent to MRS-59B, throughout MRS-59 and through the central portion of MRS-27F (Plate G2-4). No further action related to chemical contamination was recommended for HA-77 under the Fort Ord BRA (*MACTEC/Shaw, 2005*).

The reconnaissance of HA-137 (MRS-27E) was conducted in 2001. The reconnaissance of HA-137 included walking throughout MRS-27E and some surrounding areas (Plate G2-4). Because no evidence of a range or concentrated areas of military munitions were found within HA-137, no further action related to chemical contamination was recommended for HA-137 under the Fort Ord BRA (*MACTEC/Shaw, 2005*).

Surface Removal – MRS-45 and MRS-45A

As discussed in Section 3.4, a series of Time Critical Removal Actions (TCRAs) were completed within areas adjacent to BLM-managed recreational land and other publicly accessible areas that are adjacent to sites where MEC had been located in the past. The majority of MRS-45, including MRS-45A, was included in the TCRA. Surface removal was performed without the use of geophysical equipment and no vegetation was removed (*Parsons, 2002*). The field crews walked open areas and trails visually searching for MEC and munitions debris. Any MEC or munitions debris that was encountered was removed or destroyed. Only areas that were relatively clear of vegetation were searched (Plate G2-4). The field crews used PDAs and GPS to record site data, navigate the site, and record the locations of any MEC and munitions debris that was observed. No MEC or munitions debris was found within MRS-45A or in the portion of MRS-45 adjacent to MRS-45A (*Parsons, 2002*).

Site Boundaries Review

The site boundaries for MRS-27F, MRS-45, and MRS-59 were provided by the U.S. Army Corps of Engineers, Huntsville Division, and documented in the ASR (*USAEDH, 1997*). The sites were reportedly used as a bivouac area, tactical training area and a 2.36-inch rocket range. A site reconnaissance was performed within or adjacent to each of the sites as part of either the PA/SI phase of the ASR, the BRA, or the TCRA. No MEC was found within MRS-27F, MRS-45A, or MRS-59B during the reconnaissance activities. The munitions debris items found in the vicinity of the sites were of the training or practice

type. Based on the evaluation of the reconnaissance data, no modification to the boundaries of MRS-27F, MRS-45A, or MRS-59B is necessary.

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 munitions use. Visible evidence found during the site reconnaissance provides information on the type, extent, and magnitude of the munitions present. Physical features that may be present at a former site include impact craters caused by penetrating munitions, the presence of MEC and/or munitions debris 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*).

Although the Fort Ord BRA is not a part of the Military Munitions Response Program, many of the Data Quality Objectives (DQOs) identified for the Site Assessment Phase of the BRA investigation are the same DQOs established for the site reconnaissance phase of the current Military Munitions Response Program (MMRP) being implemented at the former Fort Ord (*Parsons, 2001*). The DQOs for the BRA and the MMRP identify similar inputs to the decisions used to help answer questions regarding historical site use and to define the boundaries of the area of use. The DQOs for the MMRP site reconnaissance identify various inputs to the decision such as compilation of historical information regarding potential munitions at the site (e.g., the review of interview records, field notes, aerial photographs, and historic maps). The DQOs for the BRA historical review identified similar sources of information including the review of interview records, historical maps, and aerial photographs. As part of the DQOs for a site inspection conducted for the MMRP, documentation of the type and location of MEC and munitions debris, if found, is recorded. As part of the DQOs for the BRA site reconnaissance the quantity, type and location of MEC and munitions debris found is also recorded. Both programs include using the results of the site inspections to determine if additional work (i.e., sampling for MEC and chemicals associated with MEC) is necessary. The Fort Ord BRA was conducted in accordance with the Basewide Range Assessment Work Plan (*IT, 2001*).

The TCRA that included a visual surface sweep and removal of MEC was conducted in accordance with the procedures that were described in the Programmatic Work Plan (PWP*; Parsons, 2004*). The PWP describes the procedures, methods, and resources Parsons and its subcontractors used while performing MMRP activities at the former Fort Ord. After the surface removal was completed, a visual QC inspection that covered at least 10% of the cleared grids was performed. Any MEC that was discovered was marked for demolition or removed. A QC check on the sorted munitions debris was also performed. Any item containing energetic materials was removed or marked for demolition, as described in the standard operating procedure for range residue removal (*Parsons, 2001*).

3.6.3 Sampling Review, MRS-45A

This section describes the results of the sampling associated with MRS-45A, conducted as part of the investigation of MRS-45. The review includes a comparison of sampling locations relative to site boundaries, a discussion regarding sampling equipment, methods, and quality control measures used during sampling.

Sampling Results (Items Found), MRS-45A

As summarized in Section 3.4, sampling at MRS-45 using the SS/GS sampling methodology was conducted in 1997 by CMS Environmental, Inc. (*USA, 2001*). Two of the sample grids were located

partially within MRS-45A. No MEC or munitions debris was found within these two grids or within a third grid located just west of MRS-45A (Plate G2- 3). According to the CMS work plan the sample grids were surveyed using a maximum 5 foot search lane with a Schonstedt Model GA-52/Cx magnetometer. Both grids measured 100- by 200-feet in size (20,000 square feet). A total of 245 anomalies were identified in grid TC-2 and a total of 83 anomalies were identified in grid TC-3. According to the After Action Report for MRS-45, no evidence was found during sampling that would indicate that MRS-45 was ever used as an impact area. With the exception of a HE hand grenade fragment and two grids where unknown fragments were found, no evidence of high explosive munitions were encountered and all MEC and munitions debris that was found in MRS-45 was pyrotechnic or training in nature (*USA, 2001*). All of the fragments were located approximately one-half mile or more west of MRS-45A.

Site Boundaries Review, MRS-45A

The boundary MRS-45 was provided by the USACE, Huntsville Division, and presented in the Archives Search Report (*USAEDH, 1997*). No evidence of the use of military munitions was found within the sample grid completed within, or the sample grids completed adjacent to MRS-45A. Based on the results of sampling, there is no reason to expand the boundary of MRS-45 or MRS-45A.

3.6.4 Equipment Review

This section describes results of a review of the geophysical instrument used during the sampling performed within MRS-45 and MRS-45A. Information used in this review included the penetration study presented in the Phase 2 EE/CA (*USAESCH, 1998*), the Ordnance Detection and Discrimination Study (ODDS) (*Parsons, 2001*), and the Final Site OE-45 (MRS-45) After-Action Report (*USA, 2001*).

Schonstedt Model GA-52/Cx Magnetometer

The investigation for MEC and MD within MRS-45/45A was performed by USA Environmental, Inc., using a Schonstedt Model GA-52/Cx magnetometer. This instrument is a passive dual flux-gate magnetometer – highly sensitive magnetic locators that detect ferrous (iron) metal objects; however, it cannot detect non-ferrous metal objects (e.g., lead, brass, copper, aluminum). In general, 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 magnetometer actually detects 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 Model GA-52/Cx is especially sensitive to smaller, near-surface ferro-metal objects (*Breiner, 1973*).

The Schonstedt GA-52/Cx magnetometer is a hand-held device that, when properly adjusted, will emit a distinctive tone when placed near a ferrous metal object; the volume and pitch of this tone can provide an experienced operator with qualitative information about the nature of the detected object (e.g., size, location, burial depth). It should be noted, however, that Schonstedt magnetometers will also respond to soil and rock ("hot rocks") containing ferrous minerals. It should also be noted that asphalt pavement may contain enough ferrous mineralization to produce a Schonstedt response, which can mask the response from potential MEC items. Accordingly, it is recognized that the interpretation of the Schonstedt instrument response can be subjective; for deeper targets, especially, the operator often must analyze a subtle change in the audio output and decide whether the instrument is responding to a potential MEC item or to pavement or soil minera1ization. Additionally, it can be difficult to determine the exact location of a more deeply buried object because the Schonstedt's audio response may be dispersed over an area that is several feet wide.

The Schonstedt magnetometer is a so-called analog device that does not itself record (save) any data; typically, the location of a detected object (a "hit") is marked in the field or promptly excavated to uncover the detected object. For that reason, Schonstedt surveys are sometimes called "mag and flag" or "mag and dig" surveys.

MRS-45 and MRS-45A Survey Procedures

MRS-45 encompasses approximately 401 acres (including MRS-45A) and is located in the north-central portion of the former Fort Ord (Plate G2- 1). MRS-45A is approximately 0.8 acres in size. The terrain at MRS-45 is relatively flat in the western portion with low gently sloping hills on the eastern side (including MRS-45A) of the site. Vegetation at MRS-45 includes oak trees, grassy areas, manzanita, and abundant poison oak. The sample grids at MRS-45 were cleared of vegetation using a combination of manual and mechanical brush cutting methods. USA positioned sample grids so as to minimize the requirement for vegetation removal (*USA, 2001*). MRS-45 was cleared of brush to facilitate the MEC surveys, although large oak trees were not removed. The cleared areas were divided into ninety-two 100- by 200-foot grids and grids of non-standard dimensions to facilitate SS/GS sampling. The SS/GS sampling program determined that sampling of 86 of the 92 grids was sufficient for a statistical evaluation of the site. Portions of two of the 86 grids (TC-2 and TC-3) were located within MRS-45A (Plate G2-3).

Schonstedt survey procedures, as documented in the USA work plan, were performed as follows: the hand-held Schonstedt instrument, which resembles a "walking stick" in appearance, was swung from side to side as the operator walked down the centerline of 5-foot wide search lanes delineated by lengths of rope laid on the ground. Schonstedt responses indicative of potential MEC items ("hits") were marked in the field with pin flags and the hit location was excavated until a metal object was encountered or the instrument no longer showed a response. Found objects were then mapped and cataloged. As per SS/GS protocol, not all of the anomalies identified were intrusively investigated. No MEC or munitions debris was found within the portion of the sample grid that lies within the boundary of MRS-45A or within the grids adjacent to MRS-45A.

Functional checks of the Schonstedt instruments were performed daily. Because of the nature of SS/GS sampling, QC/QA tests of SS/GS operations were limited to inspections of operational activities and documentation.

Evaluation of Schonstedt Model GA-52/Cx Detection Efficiency at MRS-45 and MRS-45A

The detection efficiency of the Schonstedt GA-52/Cx used with 5-foot lane widths was tested during the Ordnance Detection and Discrimination Study (ODDS; *Parsons Infrastructure & Technology Group, Inc. [Parsons], 2001*) seeded test. As part of the ODDS, seeded tests using munitions debris items were performed to evaluate the ability of the Schonstedt GA-52/Cx to detect munitions items buried at various depths. The seeded test was conducted with multiple lane widths, including the 5-foot width used at MRS-45 and MRS-45A. The ODDS seeded test evaluated instrument performance based on two different search radii, 1.6-foot and 3.3-foot. If the distance between the location identified by the instrument and the actual location of an item was equal to or less than the search radius the item was considered detected by that instrument.

The ODDS report included the percent of items detected (Pd) in the seeded test for each instrument. However, this Pd should not be directly translated to the Pd at an actual site. For any detection equipment, the Pd depends on the depth distribution of items. If all the items are shallow, the Pd will be high, but if all the items are deep, the Pd will be low. The depth distribution of seeded items in the ODDS was designed to test and compare the detection capabilities of different detection instruments, not to

represent a typical site. According to the ODDS Work Plan, items were seeded at three different depths, at the limit of detection, 6-12 inches shallower than the limit of detection, and 6-12 inches deeper than the limit of detection. The limit of detection was based on the ODDS static, free air tests conducted prior to the seeded tests.

The Schonstedt tools were not evaluated during the static test; therefore, only the seeded test results and field trial tests are discussed herein. It is recognized that the ODDS study areas may not represent the same field conditions as MRS-45 and MRS-45A; therefore, differences in field conditions, if applicable, should be considered when using information from the ODDS.

For the purpose of evaluating the geophysical equipment used at MRS-45 and MRS-45A, it was assumed that practice mines (found at MRS-45) may be present at MRS-45A. Practice mines would be located at or near the ground surface or potentially buried at depths of up to 2 feet below ground surface. Mines were not specifically evaluated as part of the ODDS study, however, other non penetrating items (Type I) were evaluated (illumination signals and practice hand grenades) as were penetrating items (Type II, listed below). Therefore, the Type I and Type II seeded test results from the ODDS were used for comparison purposes in evaluating the performance of the geophysical equipment used at MRS-45 and MRS-45A.

During the seeded test, the Schonstedt Model GA-52/Cx detected between 67 and 78 percent of Type I items (practice hand grenades [MKII] and illumination signals [M125, M126 and M127]) buried at depths ranging from just below the surface to 1 foot. The detection rates for Type II items (e.g., 2.36- and 3.5-inch practice rockets, practice rifle grenades, and 14.5mm training projectiles) ranged from 64 to 85 percent using the Schonstedt Model GA-52/Cx. Although not evaluated in the ODDS, practice mines that may contain energetic material generally contain a larger amount of ferrous material than the Type II items evaluated in the ODDS. This should result in a detection rate that would equal or exceed the detection rate for the Type II items evaluated. The detection rate percentages presented in the ODDS vary according to the search radius used for the analysis (either 1.6 or 3.3 feet) and assume a 5-foot wide search lane. Results for the 3-foot search lane, also evaluated as part of the ODDS, are not included in the detection percentages presented above, because the 3-foot wide search lanes were not used during the investigation. A standard search radius for investigating anomalies was not specified in the CMS work plans or after action report; therefore, the detection "range" based on the two search radii is presented above. These detection rates are considered conservative because an additional 1 foot was added to the items' calculated penetration depth to allow for soil deposition over time. Because the field conditions at the seeded test site and orientations of buried items may not be comparable to the MRS-45 or MRS-45A conditions, the results should only be used as an indication that in general, the equipment is capable of detecting the same types of items at depths that equal the items assumed burial depth.

Results of the ODDS field test trials were also reviewed for potential use in evaluating instrument performance at MRS-45 and MRS-45A. Detection ranges for the Schonstedt Model GA-52/Cx were calculated for 4 of the 6 test sites; the remaining sites did not have enough military munitions detected to allow calculation of site statistics. A standard search radius for investigating anomalies was not specified in the CMS work plan or after action reports; therefore, the detection "range" based on the two search radii (1.6 and 3.3 feet) is presented above. The calculated detection rates for the combined sites ranged from 97 to 100 percent depending on the search radius used for the calculation. 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 ordnance densities. Therefore, the field trial results may not be applicable to Track 1 sites.

Results of the ODDS field trails for field test site FTS-3, which has a military munitions density most like MRS-45, were also reviewed. Five military munitions items were located at FTS-3, and no additional

military munitions items were found after sifting 10 percent of each grid. This result indicates that it is unlikely that military munitions items would remain at FTS-3. Similar results could be expected at other sites (such as MRS-45/45A) after survey and clearance using a Schonstedt Model GA-52/Cx.

Although not directly comparable to MRS-45 and MRS-45A, the results of the ODDS indicate that with the exception of non-metallic practice mines and small arms ammunition, the Schonstedt model used at this site is capable of detecting the ferrous surface and subsurface military munitions expected at this site.

3.6.5 Sampling Methods Discussion, MRS-45A

SS/GS sampling methodologies were used at this site. As stated previously, SS/GS is a computer program used to statistically estimate the ordnance density of a site or grid during field investigations. It estimates the number of ordnance items at a given site or grid, and can be used to assess whether a site has been characterized adequately. This program was designed so there were equal chances of finding military munitions and range-related debris. Excavation of anomalies identified with a magnetometer is performed in accordance with direction of the program; generally, 32 to 40 percent of the flagged anomalies are investigated using this technique (*CMS, 1995*). The SS/GS methodology was reviewed by the EPAs Federal Facilities Restoration and Reuse Office. The Technical Support Center, EPA National Exposure Research Laboratory (NERL) in Las Vegas, Nevada also provided statistical assistance in reviewing the SS/GS methodology (*NERL, 2000*). Several problems were identified as a result of the review. The primary conclusions were: (1) the statistical procedures are vague and not well documented, (2) that conclusions about homogeneity are not consistent, (3) that the stopping rules are faulty, and (4) not able to identify military munitions clusters at a site. Although these problems were identified, the information obtained during sampling is useful in identifying the presence of and type of military munitions at the site.

As part of the sampling effort at MRS-45, 86 grids of standard (grids of 100- by 200-feet) and non-standard dimensions were sampled. Of those 86 grids, portions of two grids (of standard dimensions) were located within MRS-45A (TC-2 and TC-3). Three hundred twenty-eight anomalies were identified within grid TC-2 and adjacent grid TC-3, and 94 anomalies (28.5 percent) were sampled. No MEC or munitions debris was found.

Quality Assurance/Quality Control

The QA/QC procedures used by USA during the field operations are described below.

Field Operations QA/QC

USA conducted sampling at MRS-45 from May 21, 1997 through July 28, 1997. Throughout operations, USA performed daily operational checks and Quality Control (QC) inspections. Quality Assurance (QA)/QC performed throughout the sampling operations is documented in the After Action Report for MRS-45 (*USA, 2001*). In accordance with the USA work plan (*CMS, 1995*), all instruments requiring maintenance and/or calibration were checked prior to the start of each workday. Batteries were replaced as needed and the instruments were checked against a known source. The USA Environmental QC specialist was responsible for ensuring that personnel perform operational checks and made appropriate log entries. The QC specialist performed random unscheduled checks of the various sites to ensure the personnel performed the work as specified in the work plan.

QC inspections of the work were done by a USA Environmental Quality Control specialist. Because of the nature of SS/GS sampling, Quality Assurance and Quality Control tests of SS/GS operations was

limited to inspections of operational activities and documentation. No deficiency reports were written during inspections of the work done in MRS-45.

Data Management QA/QC

Parsons, the current munitions response contractor, performed a 100 percent QC review of the data associated with the site. This review followed guidelines presented in the Standard Operating Procedures provided as Appendix A of the *Final Track 1 Ordnance and Explosives Remedial Investigation/Feasibility Study*, dated June 21, 2004. This evaluation included a review of field grid records (if available) and the database created by the munitions response 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 SOP provided in the Final Track 1 OE RI/FS Report (*MACTEC, 2004*). The purpose of the data review was to complete a 100 percent check of all available grid records to identify discrepancies between the reports documenting field activities and the grid records. Discrepancies were then researched and corrections made, if appropriate, prior to loading the data into the project database.

Data Quality Conclusions

For the MRS-45A, the following conclusions can be made regarding the quality of the data:

- Data collected by USA indicate that portions of two sample grids associated with the SS/GS sampling at MRS-45 fell within the boundary of MRS-45A.

- Because some anomalies were not excavated using SS/GS investigative approach, some munitions debris may still be present within the portion of the sample grid that is within MRS-45A and the sample grid immediately adjacent to the site; however, because no MEC or munitions debris was found during the investigation of 94 randomly selected anomalies out of 328 total within these two grids, it is reasonable to assume that any remaining anomalies are also not military munitions.

- Problems have been identified with the statistical methods used in the SS/GS sampling as noted above; however, the sampling results are still useful in identifying military munitions potentially present at the site.

- The instrument used for sampling is very ineffective when used to locate non-metallic practice mines and small arms ammunition.

3.7 Conclusions and Recommendations

This section presents conclusions and recommendations for MRS-27F, MRS-45A, and MRS-59B that are based on review of historical information and site walk data, and sampling data collected at MRS-45A and adjacent MRS-45.

3.7.1 Conclusions

Site Use and Development

- Based on the literature review and site reconnaissance, these sites appear to have been used for general training and maneuvers and as a bivouac area. The sites are currently undeveloped. MRS-27F lies mostly within land transferred to the BLM and is open to the public for recreational use. MRS-59B, the remaining portion of MRS-27F, and a portion of MRS-45A are on undeveloped

property that is designated as a habitat corridor with limited development allowance. The remaining portion of MRS-45A lies within a development area (*USACE, 1997*).

Reconnaissance Evaluation

- The data collected during reconnaissance activities conducted within and adjacent to MRS-27F, MRS-45A, and MRS-59B, support the conclusion that: (1) training in and around these areas did not include the use of high explosives, (2) these were not impact areas, and (3) munitions debris found is consistent with use as a general training and maneuver areas (e.g., flares, simulators, practice mines, practice grenades, smoke producing items, blank small arms ammunition, etc.).

- The site reconnaissance conducted at MRS-27F and the adjacent sites as part of the PA/SI, was conducted in accordance with USACE guidance.

- The site reconnaissance conducted for the BRA met the DQOs established for that program. Many of the DQOs from the BRA are the same DQOs that are currently in use for the MMRP.

- The visual surface TCRA performed within MRS-45A was conducted in accordance with the Parsons Fort Ord Military Munitions Response Program, Programmatic Work Plan.

- Based on the historical use of these sites and the surrounding area, it is unlikely that MEC is present at MRS-27F, MRS-45A or MRS-59B; however, the following MEC items, if present at these sites, are considered to pose an acceptable risk if encountered, for the following reasons:

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 through casual (inadvertent or unintentional) 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.

MK II Practice Hand Grenade. It is possible that a person could cause a practice grenade to function if one were found at the site and be burned or exposed to metal fragments from the exploding detonator housed within the grenade; the practice grenade itself would not fragment. However, the grenade would have to contain a live fuze and functioning detonator, and these components would have been exposed to moisture, degradation, and weathering for many years, which could decrease their effectiveness.

Projectile Simulator, Air Burst: M74A1 and M74. It is unlikely that a person could cause an airburst simulator to function through casual (inadvertent or unintentional) if one were found at the site and be injured, because it would require a hard, precise blow to the primer to function. If an airburst projectile simulator is found at the site and subjected to an open flame (i.e., fire), it may function and could cause nonfatal burns and/or lacerations.

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 (inadvertent or unintentional) 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 Light Mines (M10) and Fuzes (M604). It is highly unlikely that a person would be able to trigger a fuze through casual (inadvertent or unintentional) 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.

Booby Trap Firing Devices. It is unlikely that a person through casual (inadvertent or unintentional) 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, pressure, or release of pressure that would release a cocked spring loaded firing pin. The firing pin would then impinge the primer in the coupling base, resulting in a flash and a report similar to that of a .22 caliber blank cartridge. This could result in the person causing the initiation to be slightly burned and suffer light lacerations from the firing of the primer. 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 (inadvertent or unintentional) 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.

Even though each of the sites were not entirely walked, the quantity and quality of the information generated is sufficient to make an informed decision regarding MRS-27F, MRS-45A, and MRS-59B. The investigation (site reconnaissance) was considered to be sufficient to confirm the type of military munitions used in the vicinity of the sites. Additionally, because the MEC potentially remaining pose an acceptable risk if encountered, further effort to refine the site boundaries or conduct additional sampling of the sites would not add significantly to their understanding, or change the conclusions of this report.

Sampling Adequacy and Data Quality

The Schonstedt Model GA-52/Cx magnetometer was used during the geophysical surveys conducted during sampling. This instrument was evaluated as part of the ODDS and with the exception of non-metallic mines and small arms ammunition, the instrument is capable of detecting the type of MEC items expected at this site. A numerical value for detection of items cannot be calculated for an individual site because of differences in site conditions between the ODDS sites and MRS-45A.

- The sampling methodology used at MRS-45A was SS/GS. Problems with the statistical methods used in the program have been identified; however, the data collected are useful in evaluating the past use and potential distribution of MEC at MRS-45A.

- Although the MEC sampling efforts that included a portion of MRS-45A are not consistent with requirements in place today, the quantity and quality of 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 indicate that military munitions are not present at MRS-45A. Additionally, because the military munitions items used in the vicinity of MRS-45A (at MRS-45) are considered to pose an acceptable risk (see Section 3.4), and because no MEC was found during the surface removal performed within MRS-45 and MRS-45A, additional MEC sampling at the MRS-45A would not add significantly to the understanding of the site or change the conclusions of this report.

- The U.S. Army Corps of Engineers completed munitions response investigations at MRS-27F, MRS-45A, and MRS-59B. The investigation was specifically designed to assess the nature of the past military training activities at the site. The Army, with regulatory oversight from the USEPA and the

DTSC, conducted a systematic investigation and no explosive material was found. Although sampling conducted at MRS-45A and site walks conducted at MRS-27F and MRS-59B did not include the all of each of the sites, the quantity and quality of the information generated is sufficient to make an informed decision regarding the sites. The investigation was sufficient to assess the potential presence of MEC or MD. Additionally, the MEC potentially remaining at MRS-27F, MRS-45A, and MRS-59B pose and acceptable risk if encountered.

- Based on available information regarding the site, it is unlikely that MEC is present at the site. However, if items expected to have been used during past training remain at the site, they are considered to pose an acceptable risk if encountered because, 1) some of the items would require assembly of components to function, and 2) injuries would likely be limited to minor to serious burns, lacerations, or being struck by ejecting parts (i.e., expected to be non-lethal).

3.7.2 Recommendations

Based on review of existing information, MEC is not expected to be found at MRS-27F, MRS-45A, and MRS-59B, and No Further Action related to MEC is recommended for these sites. MRS-27F, MRS-45A, and MRS-59B meet the Track 1, Category 3 criteria because historical research and field investigations identified evidence of past training involving military munitions, and training at these sites involved only the use of practice and pyrotechnic items that are not designed to cause injury. The following MEC items may be present at the site based on past site use: practice antitank mines, practice grenades, fuzes, smoke producing items, booby trap firing devices and simulators. In the unlikely event that a MEC item is found of the type previously observed in the vicinity of the sites, it is not expected that it could be caused to function through casual contact (i.e., inadvertent and unintentional contact). The MEC types potentially present at the MRS-27F, MRS-45A, and MRS-59B have been exposed to moisture, degradation, and weathering for many years which could prevent many of them from functioning. Additionally, practice antitank mines are designed to be triggered by the weight of a vehicle, commonly in excess of several hundred pounds.

For MRS-59B and the portions of MRS-27F and MRS-45A within Parcels L20.2.3.1 and L20.2.2, respectively, digging or underground "intrusive" activities are planned for the proposed reuse and development. No actionable risk was identified through the remedial investigation process. However, in the interest of safety, reasonable and prudent precautions should be taken when conducting intrusive operations at this site. As a basewide effort to promote safety and because of Fort Ord's history as a military base, the Army provides "ordnance recognition and safety training" to anyone who requests that training. Construction personnel involved in intrusive operations at the former Fort Ord may attend the Army's "ordnance recognition and safety training" to increase their awareness of and ability to identify MEC items. Section 1.3.1 (Description of the Remedy) of the Track 1 ROD (*Army, 2005a*) describes the scope of the safety training. If MEC is discovered during future development activities at MRS-27F, MRS-45A or MRS-59B, trained construction personnel should immediately stop any intrusive or ground-disturbing work in the area or in any adjacent areas and should not attempt to disturb, remove or destroy the MEC item, but should immediately notify the local law enforcement agency having jurisdiction on the parcel. The local law enforcement agency will arrange for an appropriate agency (e.g., an EOD unit) to respond.

For MRS-27F, MRS-45A, and MRS-59B, the Army recommends construction personnel involved in intrusive operations attend the Army's ordnance recognition and safety training. The Army will request notice from future landowners of planned intrusive activities, and in turn will provide ordnance recognition and safety training to construction personnel prior to the start of intrusive work. The Army will provide ordnance recognition and safety refresher training as appropriate. MRS-27F, MRS-45A, and MRS-59B should be added to the list of Track 1 sites with management controls shown in the *Munitions*

Response Site (MRS) Security Program (*Army, 2005c*). This document presents the elements of the ordnance recognition and safety training, notification procedures, and Army and local law enforcement responsibilities. In accordance with the Track 1 ROD (*Army, 2005a*), the Army will assess whether the education program should continue. If information indicates that no MEC items have been found in the course of development or redevelopment of the site, it is expected that the education program may, with the concurrence of the regulatory agencies, be discontinued, subject to reinstatement if a MEC item is encountered in the future. For the portion of MRS-27F that lies within Parcel F1.2, digging or underground "intrusive activities are not allowed under the habitat management plan (*USACE, 1997*).

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