

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

Site OE-2

Pete's Pond and Extension

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## SITE OE-2 – PETE'S POND AND EXTENSION

### 3.2 Site OE-2 (Pete's Pond and Extension)

This summary report consists of two parts. The first part, contained in Sections 3.2.1 through 3.2.5, includes a presentation and assessment of archival data. Specific elements include a review of site history and development, evaluation of potential ordnance at the site, a summary of previous ordnance and explosives (OE) investigations, and a conceptual site model. The above-mentioned information was used to support the second part of this report, which is the Site Evaluation (Section 3.2.6). 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 3.2.6.1) and evaluation of sampling process(es) (Section 3.2.6.2). These discussions are based on information from standardized literature review and sampling review checklists (Attachment 2-A1). Section 3.2.7 provides conclusions and recommendations for the site. References are provided in Section 3.2.8.

#### 3.2.1 Site Description

Site OE-2 consists of 33.5 acres located in the eastern portion of the Main Garrison (Plate 2-1). It was identified as an OE site on the basis of interviews conducted as part of a Fort Ord archive search (*U.S. Army Engineering Division, Huntsville [USAEDH, 1993]*). The site includes an area designated as Pete's Pond that is a topographic depression that seasonally fills up with runoff from storm drain discharge (Plate 2-2). This area was suspected to have been a landfill. Just west of Site OE-2 is a documented disposal area that reportedly contained medical debris. Subsequent investigations and remedial actions in these areas confirmed that they were used for disposal of incinerated and non-incinerated debris including glass bottles, metal fragments, wood, asphalt, concrete, medical waste, ordnance scrap, engine parts, and other miscellaneous refuse (*HLA, 1995*).

#### 3.2.2 Site History and Development

The following presents a summary of the site history and development that is based on archival research and review of historical training maps and aerial photographs. Plates have been prepared that present pertinent features digitized from historical training maps and scanned aerial photographs reviewed by 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 may contribute to misalignments of some map features with respect to the aerial photographs.

##### *1940s Era*

Site OE-2 lies within a tract of land purchased by the U.S. Army in 1940 from private landowners (*Arthur D. Little Inc. [ADL], 1994*). Interview records indicate the site may have been used as a chemical training area and landmine warfare training area, and also as a horse corral. Review of historical documents indicates there were no active training facilities in the Site OE-2 area during the 1940s. The following provides additional detail concerning use of the site in the 1940s:

- An interview was conducted with Mr. Maurice Macbride, a military dependent at Fort Ord from 1933 to 1947. During the interview, Mr. Macbride indicated the Pete's Pond area was used as a chemical

training area. Mr. Macbride remembered watching soldiers training with protective masks in an area between the stockade and Imjin Road (between the intersection of Fifth and Eighth Streets and the intersection of Imjin and Eighth Streets). He thought that live agents were probably not being used because the horses were not masked. He also indicated that one area within the site was later used as a landmine warfare training area (USAEDH, 1993).

- Another interview was conducted with Mr. Lee Stickler, who served as a field artillery member from 1940 to 1941 and a range control officer from 1971 through 1989. Mr. Stickler stated that in 1940 and 1941, the area was a horse corral (USAEDH, 1997).
- None of the available 1940s Fort Ord training maps identify this area as either a chemical training area or a land mine training area. Site OE-2 lies within a larger area identified on a 1945 training facilities map as “Well Area, No Artillery Firing or Demolitions.” The Well Area refers to the general area containing the Fort Ord water supply wells, and incorporates the majority of the Main Garrison (U.S. Army [Army], 1945).
- A July 25, 1941, aerial photograph shows that the site and vicinity are relatively lacking in vegetation (suggesting there may have been some vegetation clearance work performed by the Army). There is no evidence of a horse corral on this aerial photograph.
- The 1946 Main Garrison Cantonment Land Use Map indicates an area southwest of Site OE-2 as a “Horse Drawn Field Artillery Stables.” A section of Site OE-2 overlies an area designated as “PW Recreational Area” (Army, 1946). It is assumed “PW” refers to “prisoners of war”, as the recreational area was in an area designated as “P.O.W”. There is a stockade area shown west of the site that is off of the map view of Plate 2-2.
- Aerial photographs from 1949 show disturbed/cleared areas north of Pete’s Pond and in the central portion of the site. There is no evidence of a horse corral on this aerial photograph.

### 1950s Era

Review of 1950s era documentation including training maps and aerial photographs, indicates several training areas were located adjacent to Site OE-2 (Plate 2-2). These areas were used for physical training and education in handling of weapons. Aerial photographs and subsequent investigation of the site as part of the Fort Ord Basewide Remedial Investigation/Feasibility Study (RI/FS) indicate that the southwest portion of the site (Pete’s Pond and Pete’s Pond Extension) appears to have been used as a disposal area in the early 1950s. The following provides additional detail concerning use of the site in the 1950s:

- A 1954 training area map shows two “Rifle Instruction Circles” — “(RIC) 1” and “RIC 3,” and a “Confidence Course” south of the site (Army, 1954).
- A “Survey Training Area” is shown north of Pete’s Pond on a 1956 training map (Army, 1956).
- Training and facilities maps from 1956, 1957, and 1958, show rifle instruction circles “RIC 1” and “RIC 3” south and southwest of the site. A “Pole Orchard” is shown south of the site and LN-1 training area is shown southeast of the site on a 1957 map (Army, 1956, 1957 and 1958). It is assumed that “LN” refers to a “land navigation” training area.
- 1951 aerial photographs show grading/earthmoving activities at the Pete’s Pond area and Pete’s Pond extension in the southwest corner of the site (Plate 2-2). The photograph also shows an elongated north-south oriented trench immediately east of the site. There is also a stained area at the southern

tip of the site, and cleared/disturbed areas in the central portion of the site and just north of Pete's Pond. The area is transected by dirt roads.

- On the 1956 aerial photograph, the site appears similar to conditions shown on the 1951 aerial photograph. Additional buildings and a circular cleared area (possible rifle instruction circle) appear south of the site.
- Trenching activities performed as part of the RI/FS indicated that debris including OE scrap (bazooka rounds, parts to rifle and smoke grenades, and bullet shell casings), as well as incinerated debris and other refuse were disposed in the southwestern portion of the site (Pete's Pond and Pete's Pond Extension). These are non technical terms used by the field geologist to describe the OE scrap found while trenching as part of the Hazardous and Toxic Waste (HTW) investigation and cleanup program. At the time that these items were found there were no established protocols for documenting the make and model of the OE-related items encountered. The descriptions provided in the text are the only information available concerning these items. A 55-gallon drum resembling the type used to store mustard agent was also found. Vapor tests of the drum were negative for chemical mustard or mustard degradation compounds. The drum is reportedly similar to drums used to feed heating oil systems. Dated debris (e.g., bottles and newspapers) encountered during trenching had dates ranging from 1935 through 1955 (*HLA, 1995*). Based on dated material found in the trenches and evidence of grading/earthmoving activities in the 1951 aerial photograph, it is believed that the area was used as a landfill in the early 1950s. The area was excavated as part of a HTW remedial action. During the 1997 HTW soil removal program, fifty 2.36-inch inert practice rockets were found in discrete piles to a depth of 4 feet below ground surface (bgs), indicating they had been placed there for disposal (*IT Corporation [IT], 1999*).

### 1960s and 1970s Era

Review of 1960s and 1970s era documentation, including training maps and aerial photographs, shows several training areas adjacent to the site. These areas were used for physical training and education in the handling of weapons. The following provides additional detail concerning use of the site in the 1960s and 1970s:

- A 1961 map shows "LN 1" southeast of the site (*U.S. Army Corps of Engineers [USACE], 1961*).
- 1964 and 1965 maps show a "HHCA 2" and PCPTA west of the site. HHCA is an abbreviation for "Hand to Hand Combat Area." It is not known what the abbreviation "PCPTA" represents. A pole orchard and obstacle course are south of the site (*Army, 1965*).
- The 1967 and 1972 maps show HHCA 2, PCPTA, and pole orchard west and south of the site. Additionally, the 1967 and 1972 maps show a "DSS ITT course" east of the site and a "REC Shops" west of the site (*Army, 1967 and 1972*). "DSS ITT" is an abbreviation for Division Support Services individual tactical training, and "REC" refers to recreation.
- A 1966 aerial photograph shows three distinct cleared areas within the site boundary near the center of the site (Plate 2-3). Two of the areas were rectangular and one area was circular.

### 1980s and 1990s Era

Review of 1980 and 1990s era documentation, including training maps and aerial photographs, indicates the site and vicinity were no longer used for training. The following provides additional detail concerning use of the site in the 1980s and 1990s:

- The 1980 and 1984 training maps show no training areas in the Site OE-2 vicinity (*USACE, 1980, 1984*).
- The 1999 aerial photograph shows that the site has no buildings (Plate 2-4). There is a cleared or disturbed area (lacking vegetation) in the central portion of the site and another area with scarce vegetation just north of Pete's Pond.
- Following completion of the OE sampling, construction activities related to 12<sup>th</sup> Street were performed and no OE or OE scrap were found during construction.
- The southern portion of the site that includes Pete's Pond (landfill) was excavated as part of the Fort Ord HTW Cleanup. This portion of Site OE-2 has been designated as Track 0.
- An interview conducted in 1993 with a staff sergeant as part of the archives search is quoted as follows "SSG Davis also knew of chemical agent training kits (containing a 10% solution HD) which had been buried along Imjin Road" (*USAEDH, 1993*). It should be noted that chemical agent identification sets (CAISs) available during WWII, including the K941, K951/K952, K955, are described as ampoules containing (1) 3 ½ ounces of mustard, (2) 2 ml. H in 38 milliliters (ml.) chloroform (5 percent in chloroform), and 25 ml. of mustard on 90 cubic centimeters (cc) of charcoal, respectively. None of the CAIS ampoules are described as containing 10 percent solutions of mustard. As a follow-up to the statement made by Staff Sergeant Davis, the Department of the Army contacted SSG Davis, who stated that the burial of CAISs was not known to him personally and that he could not specifically identify a location where CAISs might be buried. It is not known at what period of time that these items were buried. No CAISs have been identified during subsurface investigation activities in this area (*HLA, 1995 and IT, 1999*).

### *Proposed Future Land Use*

Site OE-2 lies on property that is designated for development and will be used for public parking, a road right-of-way, and public transit support (*USACE, 1997a*).

### 3.2.3 Potential Ordnance Based on Historical Use of the Area

The following presents a summary of documented use of the site and types of ordnance that may have been used at Site OE-2.

Historical training maps indicate the site area was used as a survey training area. OE would not have been used during survey training.

Results of an aerial photograph review and remedial investigations and remedial actions indicate the southwestern portion of the area was used as a landfill. Subsurface investigations and removal actions at the site indicate the following OE-related items were disposed at the landfill at Site OE-2:

- 2.36-inch rocket (bazooka) rounds – it is not known whether these were practice or service items
- Parts to a rifle grenade – it is not known if these were parts to a practice, smoke, or high explosive grenade
- 1944 vintage shell casings – the caliber of the shell casings is not known
- 1945 vintage smoke grenade – the model of the smoke grenade is not known and it is not known if the grenade was expended

Final

- Fifty 2.36-inch inert practice rockets.

Grid sampling by an OE removal contractor found a practice grenade and a practice bomb. The exact location and depth that these items were found was not provided in the Human Factors Applications, Inc. (HFA) report. Practice ordnance are manufactured for training and generally do not contain a full payload. Practice ordnance, however, may still contain energetic components, such as spotting charges, bursters, and propulsion charges.

Based on documented training practices, these OE-related items were likely to have been transported to the site for disposal and were not used for training at Site OE-2. No CAIS or land mines were found at the site during the subsurface investigations and removal programs. Attachment 2-A2 provides a description of the types of OE-related items that were found during previous sampling programs.

Documented training activities in the site vicinity indicate that adjacent areas were used as a disposal area, pole orchard, rifle instruction circles (RICs), hand-to-hand combat training, land navigation course, confidence course, DSS ITT course, and REC shops. Pole orchards were used to practice climbing poles and installing communication lines. The RICs were used in the practice of aiming/sighting rifles. No evidence has been found that would support the use of live ammunition at the RICs (*HLA, 2000a*). Based on these training practices, no OE is expected to have been used in these adjacent areas.

Interview records indicate the site may have been used for chemical training, landmine warfare training, and as a horse corral. There are no training maps or records that indicate that the site was used for chemical or landmine warfare training. The presence of a horse corral at Site OE-2 is consistent with the presence of horse-drawn field artillery stables south of the site (as shown on a 1946 map). Based on recollections of the persons interviewed, it is unlikely that live chemical agents were used because horses at the site were not masked and because of the proximity of the site to the P.O.W. recreation area. In addition, during subsurface investigation and OE sampling programs, no CAISs or landmines were found.

Information from document reviews and literature searches indicated no ordnance-related chemical warfare materiel (CWM) was stored or used at Fort Ord. Chemical agents were used at Fort Ord in the form of CAISs, which were used to train soldiers to recognize and protect themselves from chemical agents (*Army, 1996*). These CAISs contain dilute solutions of chemical agents in small (1-ounce), hermetically sealed ampoules (glass containers). Landmine warfare training likely used practice training mines. A description of CAIS and training mines that may have been used during the 1940s is presented in Attachment 2-A2, and diagrams of CAISs are provided in attachment 2-A3.

### 3.2.4 History of OE, RI, and Hazardous and Toxic Waste (HTW) Cleanup Programs

The following summarizes OE, RI, and HTW investigations conducted at the site that provided information on past use of the site and the potential presence of OE.

#### 3.2.4.1 OE Investigations

The following describes the OE investigations that have been conducted at Site OE-2.

##### *1993 Archives Search Report (ASR)*

The purpose of the archives search was to identify sites, gather and review historical information to determine the types of munitions used at Fort Ord, 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 (*USAESCH, 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 Report (ASR) are described in Section 2.0 of this report.

Based on an interview with a military dependent located at Fort Ord from 1933 to 1947, Site OE-2 was identified as a possible chemical training area and landmine warfare area. Several 2.36-inch practice rocket (bazooka) rounds were discovered on the hillside to the east of Pete's Pond. The ASR indicated that an Explosive Ordnance Disposal (EOD) team leader stated that chemical agent training kits containing a 10 percent solution of sulfur mustard (HD) had been buried along Imjin Road. The ASR recommended further investigation of the area along Imjin Road to ascertain whether any of the buried training kits might be uncovered (*USAEDH, 1993*).

### *1994 HFA*

In 1994, HFA conducted an OE sampling investigation at the site. As part of the investigation, twenty 100- by 100-foot grids were 100 percent sampled (all anomalies detected were excavated). The grids were placed primarily within the southern portion of the site, which included the area along Imjin Road where interview records indicate that CAISs may have been buried. Four of the grids were located outside of the site boundary to the southeast of the site. The number of anomalies detected at the site was not specified in the HFA report. HFA sampling methodology is discussed in Section 3.2.6.2, and indicates the area was surveyed using a Schonstedt Model GA 52/C magnetometer along a maximum 5-foot wide search lane. Two OE scrap items (a practice grenade and a practice bomb) were found and removed during grid sampling. The exact location and depth of burial of these items was not documented in the HFA report. On the basis of the sampling results, no further action was recommended (*HFA, 1994*). A summary of the sampling operations at Site OE-2 is provided in Table 2-1. OE scrap found during HFA sampling is listed in Table 2-2.

The scope of work for HFA indicated that detailed accounting of all OE and OE scrap encountered would be performed. However, grid records providing this information are no longer available. Existing information regarding items found is summarized in the text of the HFA OE Sampling and OE Removal report (*HFA, 1994*). The report itemized inert OE-scrap found. Some non-OE scrap was removed and turned in at the end of the project.

### *1997 Phase I EE/CA*

The Phase I Engineering Evaluation/Cost Analysis (EE/CA) recommended no further action (*USACE, 1997b*).

### *1997 Archives Search Report*

The 1997 ASR summarized the results of the 1993 ASR and included the following additional information. HFA sampled 20 grids in 1994 (Plate 2-4). Two OE scrap items, a practice grenade and a practice bomb, were discovered during sampling. As part of the Fort Ord Basewide HTW cleanup, inert practice rockets were found during excavation of the Pete's Pond Extension on the site of the hill near the Directorate of Logistics (DOL) maintenance yard (*HLA, 1995b*). These rockets were destroyed by detonation. There is no information in the ASR concerning the methods of detonation. Because the debris in the area was excavated and removed and sampling yielded no evidence to support that the area was used for chemical training or landmine training, the site was recommended for no further investigation in accordance with the Phase I EE/CA (*USAEDH, 1997*).

### 3.2.4.2 RI and HTW Cleanup Investigations

#### *1991-1994 Basewide RI/FS*

As part of the Basewide RI/FS, geophysical surveys were conducted in the Pete's Pond Area and Pete's Pond extension. Ground penetrating radar (GPR), M-scope, and electromagnetic (EM) measurements were taken along transects shown on Plate 2-5. One large 80- by 200-foot anomaly was identified in the eastern corner of Pete's Pond and five smaller anomalies were detected further to the west. The EM response indicated the presence of shallow buried metal. The survey also identified two large anomalies approximately 50- by 250-feet and 50- by 120-feet on the hillside area south of Pete's Pond. High amplitude EM in-phase and M-scope responses indicated large amounts of shallow buried metal.

Four small anomalies were detected in the northwest portion of Site 17, located west of OE-2. EM responses indicated small amounts of buried metal at these locations. A large oval shaped anomaly measuring 250- by 500-feet was identified in the northeast area of Site 17. Geophysical responses across the area indicated a mix of fill types, metallic and non-metallic debris, and more conductive pore fluids. Responses indicated foreign or disturbed materials in shallow soils and at deeper depths. This feature was identified as the likely location of the disposal area.

The subsurface anomalies identified during the geophysical study were explored by excavating shallow test pits using a backhoe or similar equipment and by drilling and sampling shallow soil borings and monitoring well pilot holes. A summary of these investigation activities is provided below.

Thirty four soil borings were drilled at Pete's Pond; no OE or OE-related items were found during the drilling investigation. Forty exploratory trenches/test pits were excavated at Pete's Pond in August 1993 and April 1994. The test pit locations are shown on Plate 2-5. Material encountered in the test pits included incinerated and non-incinerated debris including glass bottles, metal fragments, wood, asphalt, concrete, medical waste, OE-related items, ordnance scrap, engine parts, ammunition boxes, and miscellaneous refuse. OE-related items and OE scrap were found in six of the trenches and consisted of a bazooka shell, a 1945 shell casing, 2.36-inch rockets, parts to a rifle grenade, a 1944-era shell casing, and a 1945-era smoke grenade. These are non-technical terms used by the field geologist to describe the OE scrap found. It is not known what parts to rifle and smoke grenades were found, what caliber bullets were found, if these items were expended, or if they were practice or service items. It is unlikely however, that a complete 2.36 inch rocket with live propellant, igniter fuze, and warhead were found.

A 55-gallon drum resembling the type used to store mustard agent was also found. Vapor tests of the drum were negative for chemical mustard or its degradation compounds. The drum is reportedly similar to drums used to feed heating oil systems (*HLA, 1995*). Table 2-3 lists the incidental OE-related items found in the vicinity of OE-2.

Four soil borings were drilled at Site 17 west of Site OE-2. A 60mm mortar canister was encountered at about 14 feet bgs in one of the borings (Boring SB-17-08). Twenty exploratory trenches were excavated at Site 17. With the exception of ammunition boxes in one trench, no OE-related items were found.

#### *Fort Ord Basewide HTW Cleanup*

In 1997, as part of the Fort Ord Basewide HTW cleanup, buried debris and contaminated soil identified during the Basewide RI/FS were excavated and removed at Pete's Pond and Pete's Pond Extension (Plate 2-4). Fifty 2.36-inch inert (M7 Series wax-filled) practice rockets were found at Pete's Pond Extension in discrete piles at a depth of 4 feet bgs (*ITT, 1999*). Table 2-3 lists these incidental OE-related items. It should be noted that another 418 (wax-filled) practice rockets were found in the landfill area

(Site 17) just west of Site OE-2. Because the practice rockets were buried in discrete piles in a disposal area, the practice rockets are believed to be the result of disposal and are not related to ordnance use at Site OE-2.

The rockets from Site OE-2 and all but 79 of the rockets from the adjacent area (Site 17) were detonated in place by Conventional Munitions Systems, Inc. (CMS) on the same day they were discovered. When the rockets were detonated, there were no secondary explosions, indicating that the rockets were not live rounds. Inspection of the rockets confirmed that they were practice rounds that had been filled with wax. Seventy-nine of the rockets from the adjacent site (Site 17) were transported by CMS to a safe holding area for disposition. There is no information concerning the filler in the rockets from Site 17 in the IT report (IT, 1999).

### 3.2.5 Conceptual Site Model

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

The CSM for Site OE-2 is based on currently available site-specific and general information including the ASR (USAEDH, 1993), Literature Review Report (HLA, 2000b), review of aerial photographs, training maps, sampling results, field observations, and technical manuals. The CSM was developed to help evaluate the adequacy of the investigation completed to date and to identify potential release and exposure pathways. Plate 2-6 presents a site conceptual model.

#### 3.2.5.1 Site Features

OE-2 contains a topographic depression corresponding to the Pete's Pond area and cleared areas in the center of the site and immediately north of Pete's Pond. Review of a 1951 aerial photograph shows that the Pete's Pond area had been graded, supporting reports that the area may have used as a landfill. The area was also reportedly used for chemical warfare training and landmine warfare training. There are no site features that would suggest a likely location for chemical or landmine training.

### 3.5.2 Training Practices

Training practices that are known or suspected to have occurred at Site OE-2 are discussed below to provide information on the potential types and distribution of OE that may have been used at the site, and the potential areas of concern remaining at the site, if any.

#### *Chemical Warfare Training*

It is not known precisely what nature of chemical warfare training took place at OE-2. A Fort Ord Yearbook from 1955 shows soldiers entering and exiting gas houses with gas masks (Army, 1955). The gas houses were filled with an irritating agent; current practice is to use tear gas (CS). CAISs were also used for training soldiers in identification of the odors and effects of chemical agents. The recommended method of training was to detonate the glass vials with blasting caps to atomize the chemicals and form a small aerosol cloud. The trainees were positioned downwind prior to the detonation and were instructed to allow the cloud to envelop them or to walk into the cloud and smell it just to recognize the odor, and to walk out of the cloud and exhale. Normally, four gases were detonated in succession with an interval

between detonation of each of the gases, and the trainees were graded on their ability to identify the gases (*Committee on Review and Evaluation of the Army Non-Stockpile Material Disposal Program, 1999*). After the demonstration, the detonation pits were decontaminated with bleach and the holes filled in (*Army, 1942*). Because of the proximity of the site to the P.O.W. recreational area and horse corral, it does not seem likely that CAISs would have been detonated in this area. Toxic gas sets (sets containing two dozen or more glass bottles) were also used for training in decontamination. War gas identification sets were used for outdoor training (*Committee on Review and Evaluation of the Army Non-Stockpile Material Disposal Program, 1999*). Information concerning CAISs is contained in Attachments 2-A2, 2-A3, and in Section 3.2.5.3 of this report.

### *Mine Training*

There is no available information about how landmine training was performed in this area in the 1940s. According to current field manuals, practice and inert mines or explosive booby trap simulators were used in training personnel in the precautions and proper methods to be observed in the care and handling, arming, booby trapping, and disarming of mines (*Army, 1997*). High explosive mines are not normally used in training, except for demonstration purposes. The 1997 training manuals indicate that live mines are used as part of current training practices, but that live mine training and simulator training will not take place concurrently at the same location in order to preclude a live mine being mistaken for an inert mine (*Army, 1997*).

Information concerning emplacement of minefields in Army training manuals serves as a guide as to how the site vicinity may have been used for mine training (FM20-32, Chapter 13 and DA PAM 350-38; *Army, 1997*). Current training in mine warfare tasks includes installation and removal of antipersonnel and antitank mines and anti-handling devices. Training also includes installation, recovery, or transfer of a hasty protective minefield as well as emplacement of tactical minefields, and row, standard pattern, and scatterable minefields. Training also includes breach of minefields (including use of explosives) as well as mine awareness training.

Based on practices described in field manuals, it is likely that during training, the trainees would learn to mark mine locations as well as practice mine removal operations. It is also likely that the trainees would practice clearing a path or lane through the minefield by probing, marking, and possibly destroying the mines with explosives or grappling hooks.

### 3.2.5.2 Potential Sources and Location of OE

The only reported training practice that may have used OE was landmine warfare training. As part of the training, practice mines may have been set up and shallowly buried at the site. It should be noted that mines have not been found during subsurface investigations at the site and no training maps show that the area was used for landmine training. CAISs may have been used for chemical warfare training. However, because of the proximity of the site to the P.O.W. recreational area and horse corral, it is unlikely that CAISs would have been detonated in this area. Accordingly, blasting caps used for CAIS detonation would not be expected at the site. There was also an unconfirmed report that CAISs were buried along Imjin Road (*USAEDH, 1993*). Aerial photograph review and subsurface investigations at the site indicate that the area around Pete's Pond and Pete's Pond extension was used as a landfill. Based on results of previous investigations and soil removal actions, various OE-related items were disposed in the landfill. It has been the Army's general practice to prohibit disposal of live OE in landfills. Fifty of the fifty-five OE-related items comprised inert training rockets, and one was a smoke grenade. It is not known whether the other items (2.36-inch rocket rounds, rifle grenade parts, and shell casings) were practice or service items. Although a 1997 soil excavation program resulted in the removal of buried OE

scrap (fifty 2.36-inch inert practice rockets) from the site, it is possible that some OE or OE scrap may still remain buried in the site vicinity.

### 3.2.5.3 Potential Exposure Routes

Although a large portion of the OE related items previously found were inert and a soil and debris removal program has been completed, there is a possibility for some OE-related items to still be buried at the site. The OE-related items may be uncovered when digging for possible future construction or utility maintenance activities. Potential exposures to OE-related items, although not expected, could result from encountering practice mines and mine fuzes, or possibly, buried CAISs. A description of practice mines used during World War II is provided in Attachment 2-A2, and diagrams of CAIS are provided in Attachment 2-A3.

For each of the OE-related items potentially remaining at the site, the following discussions provide information on: (1) how the item was designed to function, (2) the likelihood the item would function if found onsite and handled, and (3) the type of injury the item could cause if it functions. Additional information on these items is provided in Attachment 2-A2.

**Antitank Practice Mines (M1, M1A1) and Fuzes (M1A1, M1A2).** The mine, antitank, practice M1 and M1A1 was designed to simulate the M1 and M1A1 HE antitank mines. The M1 practice mine was available during World War II. The M1 series mine may be used with the M1A1 or the M1A2 fuze. They were used for training in the proper methods and precautions to be observed in the care, handling, laying, boobytrapping, arming and disarming of the M1 and M1A1 antitank mines. The mine is functioned by applying pressure (200 to 500 pounds) to the pressure plate, which fires the Activator, Antitank Mine: Practice, M1, which contained a small detonator (2.34 grains) and 20 grains of smoke composition. The activator operates when the action of a firing device initiates the igniter charge, which, in turn, ignites the smoke charge, releasing a puff of white smoke with accompanying noise (*Army 1994; Navy, 1947*). The mine could be caused to function by incidental contact by applying sufficient force to the pressure plate of the mine. The mine, being antitank by type, requires more weight than a large person can apply by just stepping on the pressure plate. It would require a vehicle to generate the necessary pressure to activate the M1 activator.

**Summary:** It is highly unlikely that a person would be able to trigger a practice antitank mine through casual 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 fuze and active 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.

CAISs potentially used or disposed at the site may have contained glass containers with small amounts of chemical agents or dilute solutions of chemical agents (See Attachment 2-A2). Two K951 CAISs were found buried at a site at Fort Ord. Because they were available in the 1940s, they are used as an example of what may be contained in CAIS kits potentially used at the site. The K951 contains glass ampoules containing mustard (HS), chloropicrin (PS), lewisite (M-1), adamsite (DM), chloracetophenone (CN), and simulated phosgene (CG). Mustard and lewisite are blister agents (vesicants), phosgene is a choking agent, and chloropicrin is a severe respiratory irritant (*USAPMCD, 1997*).

### 3.2.6 Site Evaluation

The available data (e.g., archival and reconnaissance data) regarding Site OE-2 was 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 2-A1. This section presents a summary of the results of the checklist evaluation. It is divided into two sections, an assessment of the literature review and an assessment of the sampling performed at the site.

### 3.2.6.1 Literature Review

#### *Type of Training and OE Expected*

Interviews with persons formerly living or stationed at Fort Ord indicate that the site was used for chemical training and landmine warfare training in the 1940s. A portion of the site was also used as a landfill. Review of historical maps indicate that areas adjacent to the site were used for a pole orchard (used to practice climbing for installation of communication equipment), rifle instruction circles, hand-to-hand combat training, land navigation course, a confidence course, a DSS individual tactical training course, and recreation shops.

Based the review of available information, CAISs and practice mines could have been used at the site. However, previous investigations indicate that OE-related items including rifle grenades, smoke grenades, shells, and 2.36-inch practice rockets were disposed in the landfill area. No practice mines or CAISs have been found during previous subsurface investigations.

#### *Subsequent Use of the Area*

The site is currently undeveloped and is no longer used for training.

#### *Establishment of Site Boundaries*

Site boundaries were established in the ASR and are defined by existing roads. There are no features evident from historical aerial photographs that can be used to confirm the site boundaries. A “Survey Training Area,” shown on a 1956 map, is the only designated training area within the ASR site boundary. This overlaps with but does not fall completely within the site boundaries.

#### *Summary of Literature Review Analysis*

Based on a review of site literature, the only information source indicating that Site OE-2 was used as a chemical training area or as a landmine training area is an interview record. Subsurface investigations and removal programs indicate that OE scrap was disposed in the landfill located in the western portion of the site.

### 3.2.6.2 Sampling Review

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

#### *Sampling Results (Items Found)*

The following OE-related items have been found and removed from the site during previous RI fieldwork, OE sampling programs, and the HTW soil removal program:

- One inert MK1A1 practice hand grenade
- Rifle grenade parts (model unknown)
- One inert practice bomb (model unknown)
- Fifty 2.36-inch inert practice rockets
- Shell casings (size and condition [fired or unfired] unknown)
- One vintage 1945 smoke grenade (model unknown) - it is not known if this was a practice or service grenade or if it was expended
- Four 2.36-inch rockets (it is not known if these were practice or service rockets or if they were expended).

OE scrap found during HFA sampling are listed in Table 2-2 and Table 2-3 lists incidental OE found during the RI and HTW soil removal programs.

### *Site Boundaries Review*

Sixteen out of twenty of the grids were within the site boundary. The OE-related items found during the investigation were buried and are considered to be associated with the landfill. None of the items found supports use of the site for chemical training or landmine warfare training and therefore, cannot be used to assess whether the boundaries of the site are accurate.

### *Equipment Review*

Schonstedt GA-52/C or GA-72/Cv magnetometers were used by HFA in the 1994 survey and sampling effort. The Schonstedt instruments are passive dual flux-gate magnetometers, which are highly sensitive magnetic locators that detect ferrous (iron) metal objects; however, they cannot detect non-ferrous metal objects (e.g., lead, brass, copper, and aluminum). Magnetometers make passive measurements of the earth's natural magnetic field; ferrous metal objects (and rocks) are detected because they produce localized distortions (anomalies) in the magnetic field. The Schonstedt magnetometers detect slight differences in the magnetic field (the "gradient") by means of two sensors mounted a fixed distance apart within the instruments' staff. Because the magnetic response falls off (changes) greatly even over a short distance, a gradient magnetometer like the Schonstedt GA-52/Cx is especially sensitive to smaller, near-surface ferro-metal objects (*Breiner, 1973*).

The performances of the Schonstedt GA-52/C and GA-72/Cv magnetometers were evaluated as part of the Ordnance Detection and Discrimination Study (ODDS) (*Parsons, 2001b*). As part of ODDS, studies were performed to evaluate:

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

The Schonstedt tools were not evaluated during the static tests; therefore, only the seeded test results and the field trial tests are discussed herein. It is recognized that the ODDS study areas may not represent the same field conditions as Site OE-2; therefore, differences in field conditions, if applicable, should be considered when using information from the ODDS.

The 2.36-inch rockets and grenades were evaluated as part of the ODDS. For the purposes of comparison to the seeded and field trials tests, it is assumed that buried OE-related items at Site OE-2 would be buried at depths of up to 4 feet bgs, which would correspond to Type V in the ODDS. This depth is based on the depth that the 2.36-inch rockets were buried in the landfill.

Mines were not specifically evaluated as part of the ODDS. However, other non-penetrating items (signal flares and hand grenades [ODDS Type I]) were evaluated, as were penetrating items estimated to be located at depths of 2 feet bgs (ODDS Type II). ODDS Type II items included 2.36-inch and 3.5-inch rockets, rifle grenades, and 14.5mm projectiles. Type I and II seeded test results were used for comparison purposes in evaluating the performance of the geophysical equipment used in identifying potential mines, and Type V seeded tests results were used to evaluate the potential performance of the geophysical equipment in finding buried items at this site.

During the seeded tests, the Schonstedt Model GA-52/C located between 56 (search radius of 1.6 foot and lane width of 5 feet) and 59 (search radius of 3.3 feet and lane width of 5 feet) percent of the Type I items buried at depths ranging from just below the ground surface to 1 foot bgs and the Schonstedt Model GA-72/Cv located between 63 (search radius of 1.6 foot and lane width of 5 feet) and 78 (search radius of 3.3 feet and lane width of 5 feet) percent of the Type I items. The detection rate for Type II items for the Schonstedt Model GA-52/C ranged from 44 (search radius of 1.6 foot and lane width of 5 feet) to 49 (search radius of 1.6 foot and lane width of 5 feet) percent and the detection rate for Type II items with the Schonstedt Model GA-72/Cv ranged from 41 (search radius of 1.6 foot and lane width of 5 feet) to 51 (search radius of 1.6 foot and lane width of 5 feet) percent. For Type V items, the detection rates for the Schonstedt Model GA-52/C ranged from 34 (search radius of 1.6 feet and search lane width of 5 feet) and 53 (search radius of 3.3 feet and search lane width of 5 feet) percent and from 38 (search radius of 1.6 feet and search lane width of 5 feet) and 44 (search radius of 3.3 feet and search lane width of 5 feet) percent for the Schonstedt Model GA-72/Cv.

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. The detection rate percentages presented in the ODDS varied according to the search radius, which ranged from 1.6 to 3.3 feet, and the search lane width, which was 3 to 5 feet wide. A 5-foot wide search lane was used during the OE sampling programs at the site. Results for the 3-foot wide search lanes were not included in the detection percentages presented above because 3-foot search lanes were not used during the site investigations. A standard search radius for investigation anomalies was not specified in work plans or reports, therefore, the detection range for the different search radii are presented above. The anomalies were excavated until a metal object was found.

The seeded test detection rates are considered conservative because 1 foot was added to the item's calculated penetration depth to allow for soil deposition over time. Because the field conditions at the seeded test site and orientation of the subsurface item may not be comparable to Site OE-1 conditions, the results should only be used as an indication that the equipment is capable of detecting the same types of items at depths that are the same as used in the seeded tests.

Results of the ODDS Field Trial Sites (FTS) were also reviewed for potential use in evaluating instrument performance at the site. Detection rates were calculated for four of the six test sites; the remaining sites did not have enough OE detected to allow calculation of site statistics. The calculated detection rates for



the combined sites ranged from 52 to 96 percent for the Schonstedt Model GA-52/C and 64 to 98 percent for the Schonstedt Model GA-72/Cv, depending on the search radius used for the calculation. As previously discussed, results for the 3-foot wide search lanes were not included in the detection percentages presented above because 3-foot search lanes were not used during the site investigations. The lower detection rates were for a 1.6-foot search radius and the higher detection rates were for a 3.3-foot search radius. It should be noted that the ODDS field trial sites were selected to represent areas with high OE density. In comparison, Track 1 sites, such as OE-2, are expected to have very low densities of OE scrap. Therefore, the field trial results may not be directly applicable to OE-2.

Although not directly comparable to Site OE-2, the results of the ODDS indicate that the Schonstedt Models GA-52/C and –72/Cv are capable of detecting the ferrous surface and subsurface OE expected at this site. However, the equipment used at this site may be limited by the depth of burial of the OE-related items. It should be noted that the items found at Site OE-2 were found in buried clusters at depths of 4 feet bgs. Similar concentrations of OE-related items and depths of burial would likely be found by the Schonstedt. It should be noted that these magnetometers are not capable of detecting non-ferrous items such as plastic training mines or individual glass vials in CAISs. However, if the CAISs were contained in their metal packing container, they could be detected by the magnetometers. Two CAISs were detected at Site 13B at Fort Ord using a magnetometer.

### *Sampling Methods Discussion*

According to the work plan, the center of the site and the outer boundaries of the site were located and marked (HFA, 1993). Twenty survey grids were located randomly and marked within the site boundaries. The grid dimensions were 100- by 100-feet and were separated by at least 200 feet. The grids were inspected visually and investigated electronically using a Model GA-52/C or GA-72/Cv magnetometer along a maximum 5-foot wide search lane. Surface items were plotted on a map and then removed. Subsurface contacts and anomalies were marked with yellow flags for excavation and identification. Subsurface contacts were uncovered using hand tools (HFA, 1993 and 1994). The general approach to investigation of the anomalies was to dig down to metal, remove the metal, and check the excavated area with the Schonstedt. If the Schonstedt indicated that there was no buried ferrous material, no further digging was performed. If the Schonstedt continued to indicate buried ferrous items, the area was excavated to at least 4 feet bgs. All anomalies identified were investigated. Two OE scrap items (a practice grenade and a practice bomb) were found and removed. The locations and depths that these items were found were not documented in the HFA report. In addition, the number of anomalies found was not documented in the HFA report.

### *Quality Assurance/Quality Control*

The QA/QC procedures used during sampling and data management are described below.

#### *Field Sampling QA/QC*

Specific information concerning operational procedures was not documented in the HFA final report (HFA, 1994). The following describes field procedures specified in the work plan. According to the HFA work plan, equipment was to be inspected by the Senior UXO Supervisor (SUXOS) and Quality Control/Site Safety Officer (QC/SS) prior to placing it in service. Magnetometers were to be inspected and tested daily on a buried piece of ordnance (test source) to ensure that the magnetometers were calibrated and operating within specification. The buried test source (inert ordnance item) was to be magnetically similar to a 2.36-inch rocket and buried at a depth of 3 feet. Information in the final report indicated that a solid steel 81 mm mortar, buried at 4 feet bgs was used. The magnetometers were to be tested before starting OE operations in the morning and when operations resumed after lunch.

Magnetometers that failed the inspection and test were determined to be in need of repair and were to be removed immediately from service. Random checks were to be performed by the QC/SS and/or the SUXOS during daily operations. The QC/SS was to inspect all records bi-weekly to ensure that they were kept and maintained. After surface and subsurface clearance of each site and prior to removal of grid markers, the QC/SS was to perform the standard minimum 10 percent QC check. If OE was detected during the QC check, the grid was searched again to ensure no other OE was present. All grids were to be left in place until the Army Corps of Engineers Huntsville Division (CEHND) Safety Specialist completed QA procedures. No QA records for this sampling effort are available. QC reports that included descriptions and results of the QC checks were to be completed daily.

### Data Management QA/QC

Parsons, the current OE contractor, performed a 100 percent QC review of the data associated with the site. This review followed the guidelines presented in the Standard Operating Procedures in Appendix A of this report. This evaluation included a review of field grid records (if available) and the database created by the OE contractor. The USACE followed up with a 10 percent Quality Assurance (QA) review of the Parsons data review. The requirements of this data review are described in the SOP provided as Appendix B of this report. The purpose of the data review was to complete a 100 percent check of all available grid records to identify discrepancies between the after action reports 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 this site, the following conclusions can be made regarding the quality of the data:

- The data collected by HFA were useful in providing information concerning the type of OE-related items present at the site.
- The grids were located primarily in the southern portion of the site, which included the area along Imjin Road where a former staff sergeant indicated that CAISs had been buried.
- Coordinate data were not collected for locations and depths of found items.
- The probability of detecting OE buried in pits at depths of 4 feet or more has not been evaluated and is unknown (Equipment Review, Section 3.2.6.2 – Sampling Review).
- No QA records for this sampling effort are available.

### 3.2.7 Conclusions and Recommendations

This section presents conclusions and recommendations for Site OE-2 that are based on review of historical information and sampling data collected from the site.

#### 3.2.7.1 Conclusions

##### *Site Use and Development*

- Based on interview records, the site was reportedly used for chemical training and landmine warfare training. There was an unconfirmed report that CAIS had been buried at the site along Imjin Road. OE sampling results and results of subsurface investigation and removal programs conducted as part

of the Basewide RI/FS and HTW cleanup programs do not support this past site usage. It should be noted that OE sampling was performed along Imjin Road, where the CAISs were reportedly buried. If the CAISs were stored in metal cans they would have been detected by the magnetometer as would metal practice mines. All anomalies were excavated and no CAISs or practice mines were found.

- Results of the aerial photograph review and subsurface investigations verify that the western portion of the site was used as a landfill. OE-related items have been found during subsurface investigations in the landfill area, and are assumed to have been disposed in this area rather than used as part of military training. It is not known if the items found were practice or service rounds; however, during the soil excavation program of the disposal area, only buried inert practice rockets were found and removed. There is, however, a possibility that some OE or OE scrap may still remain buried at the site.
- Items potentially present include potential CAISs disposed in burial pits and training mines. None of these items have been found at the site to date. If the CAISs are present at the site, are unearthed and broken open, depending on the exposure scenario, the chemicals in the CAISs could cause serious health effects. The following OE item, if present at the site, is considered to pose an acceptable risk if encountered for the following reasons. Additional information is provided in Attachment 2-A2.

**Antitank Practice Mines (M1, M1A1) and Fuzes (M1A1, M1A2).** It is highly unlikely that a person would be able to trigger a practice antitank mine through casual 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 fuze and active 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.

- The site is part of property that is designated for development and will be used for public parking, a road right-of-way, and public transit support (*USACE, 1997a*).
- The southern portion of the site that includes Pete's Pond (landfill) was excavated as part of the Fort Ord HTW Cleanup. This portion of Site OE-2 has been designated as Track 0.

### *Sampling Adequacy and Data Quality*

- Sixteen of twenty sampling grids were located within the site boundary at the location of a cleared/disturbed area and the apparent location of the landfill.
- 100 percent grid sampling was performed at the site in which all of the anomalies in a grid were excavated and identified. The equipment used was limited by the potential depth of burial at the site.
- Schonstedt GA-52/C and GA-72/Cv magnetometers were used during previous investigations. These instruments were evaluated as part of the ODDS and with the exception of items buried at depths of 4-feet or greater, are capable of detecting the type of OE (WWII practice mines) expected at this site.
- The data collected by HFA were useful in providing information concerning the type of OE-related items present at the site. However, coordinate data were not collected for locations and depths of found items and the probability of detecting OE buried at depths of 4 feet or deeper has been evaluated and is unknown. The magnetometers used by HFA during sampling are not capable of detecting non-ferrous items such as plastic training mines or individual glass vials in CAISs. However, if the CAISs were contained in their metal packing container, they could be detected by the magnetometers as would metallic practice mines.

- Although the previous OE sampling efforts performed at Site OE-2 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.

### 3.2.7.2 Recommendations

Based on the review of existing data:

- It is not anticipated that OE will be found at Site OE-2. However, there is a potential for OE to be present at the site because OE were used throughout the history of Fort Ord.
- If CAISs were disposed at the site, exposure to chemicals contained in the vials by someone digging them up and breaking them open could cause serious health effects. However, reports of CAIS burial at the site could not be verified, and no evidence of their presence was found during OE investigations or other removal activities.
- Further research should be performed to verify discussions with Staff Sergeant Davis regarding the validity of the reports of CAIS burials in the site vicinity. This site should be retained in the Track 1 process.

### 3.2.8 References

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

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

Committee on Review and Evaluation of the Army Non-Stockpile Material Disposal Program, 1999. *Disposal of Chemical Agent Identification Sets*.

Harding Lawson Associates (HLA), 1995. *Basewide Remedial Investigation/Feasibility Study, Fort Ord, California*. October 19.

\_\_\_\_\_, 2000a. *Draft Final, Literature Review Ordnance and Explosives Remedial Investigation/Feasibility Study Former Fort Ord, California*. January 4. (46310 00176).

\_\_\_\_\_, 2000b. *Final Plan for Evaluation of Previous Work Ordnance and Explosives Remedial Investigation/Feasibility Study, Former Fort Ord, California*. December 4.

Hogg, Ian V., 2001. *The American Arsenal*. Greenhill Books. London.

Human Factors Applications, Inc. (HFA), 1993. *Ordnance and Explosive Waste (OEW) Site Operations, Ford Ord-Phase I Work Plan and Accident Prevention Plan*. December.

\_\_\_\_\_, 1994. *OEW Sampling and OEW Removal Action. Ft. Ord Final Report*. December 1.

IT Corporation (IT), 1999. *Remedial Action Confirmation Report And Post-Remediation Health Risk Assessment Sites 16 And 17 Remedial Action Basewide Remediation Sites Former Fort Ord, California. Volume I Remedial Action Confirmation Report. Draft*. April.

- Parsons Infrastructure & Technology Group Inc. (Parsons), 2001a. *Draft Ordnance and Explosives, Sampling and Analysis Plan, Former Fort Ord, Monterey, California, Ordnance and Explosive Cleanup*. July.
- \_\_\_\_\_, 2001b. *Draft Ordnance Detection and Discrimination Study (ODDS), Former Fort Ord, Monterey, California*. August.
- U.S. Army, 1942. *Instructions for Using Gas Identification Sets*. Pamphlet No. 4. Chemical Warfare School, Edgewood Arsenal, Maryland. January.
- \_\_\_\_\_, 1945. *Training Facilities, Fort Ord and Vicinity, California*. Revised August 1945.
- \_\_\_\_\_, 1946. *Main Garrison Cantonment Land Use Map, 53-1-9, 2a*. March 20.
- \_\_\_\_\_, 1954. *Training Areas That Cannot Be Used At Same Time: (As Presented In Use)*. Circa 1954.
- \_\_\_\_\_, 1956. *Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "O"*. Revised 20 December 1956.
- \_\_\_\_\_, 1957. *Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "H"*. Revised: 15 July 1957.
- \_\_\_\_\_, 1958. *Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "H"*. Revised: 10 January 1958.
- \_\_\_\_\_, 1965. *Close In Training Areas & Selected Post Facilities. Appendix 3 to Annex 0, 350-72*. August 16.
- \_\_\_\_\_, 1967. *Back County Roads, Field Training and Range Map*. January 1967.
- \_\_\_\_\_, 1972. *Training Ranges and General Road Maps*. March 16.
- \_\_\_\_\_, 1997. *Standards in Weapons Training, Army Pamphlet 350-38*. Headquarters Department of the Army, Washington, D.C. DA PAM 350-38. July.
- U.S. Army Corps of Engineers (USACE), 1961. *Basic Information, Training Facilities*. Revised as of 30 June 1961.
- \_\_\_\_\_, 1980. *Training Facilities Map, Basic Information maps, Master Plan. Sacramento Corps of Engineers*. March.
- \_\_\_\_\_, 1984. *Training Facilities Map, Basic Information Maps, Master Plan. Engineer District Sacramento*. June.
- \_\_\_\_\_, 1996. *Project Manager for Non-Stockpile Chemical Materiel, Survey and Analysis Report, Second Edition*. December.
- \_\_\_\_\_, 1997a. *Installation-Wide Multispecies Habitat Management Plan for Former Fort Ord California. Sacramento District*. April.
- \_\_\_\_\_, 1997b. *Engineering Evaluation/Cost Analysis – Phase I, Former Fort Ord, Monterey County, California. Final*. September.

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

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

U.S. Army Program Manager for Chemical Demilitarization (USAPMCD), 1997. K951 Chemical Agent Identification Set Assessment Plan at Former Fort Ord, Monterey, County, California. September.

U.S. Navy, 1947. *NAVSEA OP 1664, U.S. Explosive Ordnance*. Published by Direction of Commander, Naval Sea Systems Command. May 28. Changed January 15, 1969.

## TABLES

Table 2-1. Sampling Operations, Site OE-2  
Track 1 Ordnance and Explosive Remedial Investigation/Feasibility Study  
Former Fort Ord, California

Site	Grid	Operation Type	Contractor	Instrument	Grid Completion Date
OE-02 -- Pete's Pond	D2C6H8-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2C6J0-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2C6J8-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2C7J4-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D6C8-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7A1-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7A3-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7B3-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7B6-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7C5-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7C7-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7D3-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7D6-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7D7-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7E5-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7E6-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7E7-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7F4-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7F5-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	D2D7F7-01	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available
OE-02 -- Pete's Pond	OE-02	Sampling	HFA	SCHONSTEDT GA-72CV or GA-52C	Not available

Site = OE Site Number

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

SS/GS = Sitestats/Gridstats sampling was performed, selected anomalies were excavated.

HFA = Human Factors Applications, Inc.

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



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

Site	Grid	OE Items	Status	Depth (in)	Quantity
OE-02 -- Pete's Pond	OE-02	Grenade, hand, training, MK1A1	Inert		1
OE-02 -- Pete's Pond	OE-02	UNKNOWN MODEL: BOMB, PRACTICE, EMPTY (OE Model Unknown)	Inert		1

---

Site = OE Site Number

Grid = Grid in which item was found.

Status = Condition of item, either live or inert. Inert indicates no OE hazard.

Depth = inches below ground surface that item was found.

Quantity = Number of like items found.

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

Table 2-3. Incidental OE Items Found, Site OE-2 and Vicinity  
Track 1 Ordnance and Explosive Remedial Investigation/Feasibility Study  
Former Fort Ord, California

Site or Area	Operation Type	OE Items	Contractor	Status	Depth (in)	Quantity	Date found
OE-02; Site 16-Pete's Pond Extension	Basewide RI/FS	ROCKET, HEAT, 2.36 INCH	HLA	unknown	0	1	8/16/1993
OE-02; Site 16-Pete's Pond Extension	Basewide RI/FS	SHELL CASING (1944) (OE Model Unknown)	HLA	unknown	0	1	8/17/1993
OE-02; Site 16-Pete's Pond Extension	Basewide RI/FS	1945 smoke grenade	HLA	unknown	0	1	8/18/1993
OE-02; Site 16-Pete's Pond Extension	Basewide RI/FS	ROCKET, 2.36 INCH	HLA	unknown	0	3	8/20/1993
OE-02; Site 16-Pete's Pond Extension	Basewide RI/FS	ROCKET, 2.36 INCH	HLA	unknown	0	1	8/20/1993
OE-02; Site 16-Pete's Pond Extension	Basewide RI/FS	RIFLE, GRENADE PARTS (OE Model Unknown)	HLA	unknown	0		3/14/1994
OE-02; Pete's Pond Extension	HTW Cleanup	ROCKET, 2.36 INCH, M7 SERIES	IT	inert practice	48	1	4/3/1997
OE-02; Pete's Pond Extension	HTW Cleanup	ROCKETS, 2.36 INCH	IT	inert practice	48	49	4/8/1997

Site = OE Site Number.

Status = Condition of item, either live or inert, inert indicates no OE hazard (i.e., OE scrap).

Depth = inches below ground surface that the item was found.

Quantity = Number of like items.

RI/FS = Remedial Investigation/Feasibility Study

HTW = Hazardous and Toxic Waste

## PLATES

## Disclaimer

The following plates have been prepared to present pertinent features digitized from historical training maps and scanned aerial photographs. It should be noted that minor discrepancies between source maps, combined with the natural degradation of older source maps and photographs, has resulted in misalignment of some map features. In addition, camera angle and lens distortion introduced into older aerial photographs, combined with changes in vegetation and site features over time may contribute to misalignments of some map features with respect to the aerial photographs.

ATTACHMENT 2-A1

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 LITERATURE REVIEW

Yes          No          Inconclusive

**TYPE OF TRAINING AND OE EXPECTED**

**1. Is there evidence that the site was used as an impact area (i.e., fired OE such as mortars, projectiles, rifle grenades or other launched ordnance)?**

	No	
--	----	--

**Sources reviewed and comments**

The only reference to a training area within the boundaries of Site OE-2 is a "Survey Training Area" shown in the northern portion of Site OE-2 (to the north of Pete's Pond) on a map dated December 20, 1956. This site lies within an area identified on a 1945 map as a "Well Area, No Artillery Firing or Demolitions." Numerous training sites were located immediately adjacent (primarily to the west and south) over the years. The training sites included rifle instruction circles, physical training areas, confidence course, pole orchard, hand to hand combat area, land navigation, and a DSS ITT course. 2.36-inch rockets (projectiles) have been found within the landfill portion of Site OE-2 (south of 8th Street). However, it is believed that the presence of the rockets are related to the disposal of the items at this site and not from onsite firing. The southern portion of the site (Pete's Pond) was used as a disposal area in the 1950s.

**References**

Army 1945, 1946, 1956, 1957, 1958; USAEDH, 1993; HLA, 1995; IT, 1999

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

Yes		
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**Sources reviewed and comments**

The site was reportedly used as a landmine warfare training area. Practice mines may contain smoke charges. The charges contain black powder and red phosphorous which can be considered low explosive items.

**References**

USAEDH 1993; Army, 1977.

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 LITERATURE REVIEW

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

Yes	No	Inconclusive
Yes		

**Sources reviewed and comments**

The site was reportedly used as a landmine warfare training area. Practice mines may contain smoke charges which are considered pyrotechnic items.

**References**

USAEDH 1993; Army, 1977.

**DEVELOPMENT AND USE OF THE SURROUNDING AREA**

**4. Does subsequent development or use of the area indicate that OE would have been used at the site?**

	No	
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**Sources reviewed and comments**

The site remains undeveloped and is no longer used as a training area.

**References**

Army, 1984.

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

	No	
--	----	--

**Sources reviewed and comments**

Areas to the west and south are developed. Adjacent training areas appear to be physical training areas (e.g., pole orchard, hand to hand combat, rifle instruction circles, confidence course).

**References**

Army, 1954, 1956, 1957, 1958, 1961, 1964, 1965, 1967, 1968, 1972.

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 LITERATURE REVIEW

Yes          No          Inconclusive

**ESTABLISHMENT OF SITE BOUNDARIES**

**6. Is there evidence of training areas on aerial photographs that could be used to establish**

	No	
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**Sources reviewed and comments**

Several cleared and disturbed areas are visible in aerial photographs. However, there are no site features that would suggest a likely location for chemical or landmine training. 1951 aerial photos show grading activities in the Pete's Pond area.

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

	No	
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**Sources reviewed and comments**

A "Survey Training Area", shown on a 1956 map, is the only designated training area within the ASR site boundary. This training area overlaps with but does not fall completely within the site boundaries.

**References**

Army, 1956

**8. Should current boundaries be revised?**

	No	
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**Sources reviewed and comments**

The current boundaries do not need to be revised because they include the area described as the chemical training area and also include the disposal area at Pete's Pond.

**RESULTS OF LITERATURE EVALUATION**

**Does the literature review provide sufficient evidence to warrant further investigation?**

		Inconclusive
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**Comments**

There was one unconfirmed report that CAIS were buried at the site along Imjin Road. Interview records indicate that the site was used for chemical and landmine warfare training. However, maps from the 1940s do not show that the area was used for chemical or mine training.



ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 LITERATURE REVIEW

<b>References</b>	<b>Yes</b>	<b>No</b>	<b>Inconclusive</b>
Harding Lawson Associates (HLA), 1995. Basewide Remedial Investigation/Feasibility Study, Fort Ord, California. October 19.			
IT Corporation (IT), 1999. Remedial Action Confirmation Report And Post-Remediation Health Risk Assessment, Sites 16 And 17, Remedial Action, Basewide Remediation Sites, Former Fort Ord, California. Volume I. Remedial Action Confirmation Report. Draft. April.			
U.S. Army (Army), 1945. Training Facilities, Fort Ord and Vicinity, California. Revised August 1945.			
_____, 1946. Main Garrison Cantonment Land Use Map, 53-1-9, 2a. March 20.			
_____, 1956. Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "O". Revised 20 December, 1956.			
_____, 1957. Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "H". Revised: 15 July 1957.			
_____, 1956. Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "O". Revised 20 December 1956.			
_____, 1958. Map of Fort Ord Training Areas & Facilities. Enclosure I to Annex "H". Revised: 10 January, 1958.			
_____, 1965. Close In Training Areas & Selected Post Facilities. Appendix 3 to Annex 0, 350-72. August 16, 1965.			
_____, 1967. Back County Roads, Field Training and Range Map. January, 1967.			
_____, 1972. Training Ranges and General Road Maps. March 16.			
_____, 1977. Technical Manual, Army Equipment Data Sheets for Land Mines. TM 43-001-36. February.			
_____, 1984. Training Facilities Map, Basic Information maps, Master Plan. June 1984.			
U.S. Army Engineering Division, Huntsville (USAEDH), 1993. Archives Search Report Fort Ord California, Monterey County, California. December. Prepared by U.S. Army Corps of Engineers St. Louis Division.			

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

**1. Is there evidence that the site was used as an impact area (i.e., fired OE such as mortars, projectiles, rifle grenades and other launched ordnance)?**

Yes	No	Inconclusive
	No	

**Sources reviewed and comments**

There is no evidence to suggest that the area was an impact area. Several OE items were found on a hill adjacent to a landfill area. Other OE items were found buried in the landfill area. The site was reportedly used for land surveying training, chemical training, and landmine warfare training which do not involve launched ordnance. The site lies in close proximity to buildings and a ball field; therefore, it is unlikely that the area would be used as an impact area.

**References**

USAEDH, 1993; HLA, 1995; IT, 1999

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

Yes		
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**Sources reviewed and comments**

The site was reportedly used for land surveying training, chemical training, and landmine warfare training.

**References**

USAEDH, 1993; Army, 1956, 1977; HLA, 1995; IT, 1999.

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

Yes		
-----	--	--

**Sources reviewed and comments**

Practice mines may have been used for landmine warfare training. No mines were found during sampling. Practice mines may contain smoke charges which are considered pyrotechnic items.

**References**

USAEDH, 1993; Army, 1977

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

**4. Was sampling and/or reconnaissance performed within the appropriate area?**

Yes	No	Inconclusive
Yes		

**Sources reviewed and comments**

boundary and were located in the area of the landfill as well as in the general location identified as the chemical training area.

**References**

HFA, 1994.

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

Yes		
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**Sources reviewed and comments**

OE scrap was found including a practice grenade, practice bomb, rifle grenades, smoke grenades, shell casings, and 2.36-inch rockets. These were found in a landfill area.

**References**

HFA, 1994; HLA, 1995; IT, 1999.

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

	No	
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**Sources reviewed and comments**

The site was identified as a chemical training area and landmine training area. No landmines or chemical agent identification kits have been found during subsurface investigation programs.

**References**

USAEDH, 1993; HFA, 1994; HLA, 1995; IT, 1999.

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

		Inconclusive
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**Sources reviewed and comments**

There were several OE items of 1944 and 1945 vintage found buried in the area of the site that was used as a landfill. These OE were not the type that would have been used for chemical or landmine training. These OE were probably not used at the site but were brought there for disposal; therefore the OE can not be used to verify the dates that the site was used for training.

**References**

HLA, 1995; IT, 1999

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

	Yes	No	Inconclusive
<b>8. Was HE fragmentation found?</b>	<input type="checkbox"/>	<input type="checkbox"/>	Inconclusive

**Sources reviewed and comments**

Shells were found in trenches excavated during the RI/FS and removal action. Because the shells were found in a landfill area and reported training activities would not have included use of the shells, it is believed that they were brought to the site for disposal and were not used during training.

**References**

HLA, 1995, IT, 1999.

<b>9. Was HE found?</b>	<input type="checkbox"/>	No	<input type="checkbox"/>
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**Sources reviewed and comments**

Only inert OE scrap was reportedly found

**References**

HLA, 1995, IT, 1999.

<b>10. Were LE found?</b>	<input type="checkbox"/>	No	<input type="checkbox"/>
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**Sources reviewed and comments**

Only inert OE scrap was reportedly found

**References**

HLA, 1995, IT, 1999.

<b>11. Were pyrotechnics found?</b>	<input type="checkbox"/>	No	<input type="checkbox"/>
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**Sources reviewed and comments**

Only inert OE scrap was found

**References**

HLA, 1995.

<b>12. Were smoke producing items found?</b>	<input type="checkbox"/>	No	<input type="checkbox"/>
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**Sources reviewed and comments**

Only an inert smoke grenade was found.

**References**

HLA, 1995.

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

**13. Were explosive items found (e.g. rocket motors with explosive components, fuzes with explosive components)?**

Yes	No	Inconclusive
	No	

**Sources reviewed and comments**

OE found were reportedly inert.

**References**

HFA, 1994, IT, 1999.

**14. Do items found in the area indicate training would have included use of training items with energetic components?**

Yes		
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**Sources reviewed and comments**

An inert practice smoke grenade was found. No mines were found.

**References**

HLA, 1995; Army 1977.

**15. Were items found in a localized area (possibly the remnants of a cleanup action)?**

Yes		
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**Sources reviewed and comments**

OE items were found in disposal trenches.

**References**

HLA, 1995; IT, 1999.

**16. Has the site been divided into sectors to focus on areas of common usage, similar topography and vegetation, and/other unique site features?**

	No	
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**Sources reviewed and comments**

The site was not divided into sectors based on past usage or site features.

**References:**

HFA, 1994.

**17. Should current site boundaries be revised?**

	No	
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**Sources reviewed and comments**

The current boundaries do not need to be revised because they include the area described as the chemical training area and also include the disposal area at Pete's Pond. OE scrap was found in the disposal area.

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

**18. Was equipment used capable of detecting items suspected at the site at the maximum expected depth?**

Yes	No	Inconclusive
		Inconclusive

**Sources reviewed and comments**

used by HFA to investigate the site. Some practice mines can be non-metallic, and therefore would not be detected by the magnetometers. Equipment would not be able to detect individual glass containers comprising chemical agent identification sets (CAIS). However, if the CAIS were contained in a metal packing container, they would be detected by the Schondstedt. The Schondstedt GA-52/C and GA-72/Cv magnetometers are also less effective at detecting metal items at depths of 4 feet or greater (the depth at which

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

		Inconclusive
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**Sources reviewed and comments**

The Schondstedt family of instruments detects only ferrous items. Some of the OE-related items potentially used at the site could include non-metallic mines and therefore, would not have been detected using the above referenced equipment. In addition, individual glass containers from the CAIS would not be detected by the Schondstedt.

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

		Inconclusive
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**Sources reviewed and comments**

Although not directly comparable to Site OE-2, the results of the ODDS indicate that the equipment used would be capable of detecting ferrous OE buried up to 2 feet bgs. The probability of detecting OE buried at depths of 4 feet or deeper has not been evaluated and is unknown. CAIS and nonmetallic practice mines would not be detected by magnetometers.

**References**

Parsons, 2001.

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

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

**Sources reviewed and comments**

The Schondstedt magnetometers are not effective at detecting OE at the depths they were encountered in the

**References**

Parsons, 2001; IT, 1999.

<b>22. Were all the instruments used to evaluate the site maintained and calibrated in accordance with associated work plan and manufacturer's specifications?</b>	Yes		
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**Sources reviewed and comments**

As stated in the After Action report, "Each magnetometer was tested each morning and field tested after lunch to determine that it was operating correctly,"

**References**

HFA, 1994.

<b>23. Based on the anticipated target density (UXO items per acre) has the minimal amount of sampling acreage been completed in accordance with the scope of work or contractor work plan?</b>			Inconclusive
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**Sources reviewed and comments**

There is no anticipated density of items. The OE found at the site was associated with the landfill.

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

200,000 square feet (approximately 4.59 acres) sampled by HFA based on 20 100x100-foot grids. No OE was found.

**References**

HFA, 1994.

Total Area: 200,000 sq ft		
OE Density:	Not calculated	

ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

Yes      No      Inconclusive

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

**Sources reviewed and comments**

HFA: 100% sampled (The number of anomalies is unknown).

**References**

HFA, 1994

Total % of anomalies investigated	HFA: 100%
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**26. Was the appropriate data processing scheme used for the site, how was the data processed?**

		Not applicable
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**Sources reviewed and comments**

Not applicable. No digital geophysical data was collected.

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

Yes		
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**Sources reviewed and comments**

"The project was completed without QC discrepancy," (HFA, 1994).

**Result of Sampling Evaluation**

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

	No	
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**Comments**

No OE related to past training activities at the site (chemical training or landmine warfare training) were found during OE sampling and remedial investigations and removal programs. These programs involved geophysical investigations, trenching, and excavation in areas overlying the former landfill as well as in cleared/disturbed areas within the site boundaries. There was one unconfirmed report that CAISs were buried at the site. Individual glass containers from the CAISs would not be detected by the magnetometers used. Further research should be performed to verify the validity of reports of CAIS burials in the site vicinity.



ATTACHMENT 2-A1  
 EVALUATION OF PREVIOUS WORK  
 EVALUATION CHECKLIST: Site 2, Pete's Pond  
 SAMPLING EVALUATION

<b>REFERENCES</b>	<b>Yes</b>	<b>No</b>	<b>Inconclusive</b>
<p>Army, 1946. Main Garrison Cantonment Land Use Map, 53-1-9, 2a. March 20.</p> <p>Technical Manual, Army Ammunition Data Sheets for Land Mines (FSC 1345), TM 43-0001-36. February 14. HLA# 62040</p> <p>Ordnance Disposal Division, OEW Site Operations Fort Ord-Phase I Work Plan and Accident Prevention Plan. December.</p> <p>HFA, 1994. Human Factors Applications, Inc. Explosive Ordnance Disposal Division, OEW Sampling and OEW. Removal Action, FT. ORD FINAL REPORT. December 1.</p> <p>Harding Lawson Associates (HLA), 1995. Basewide Remedial Investigation/Feasibility Study, Fort Ord, California. October 19.</p> <p>IT, 1999. Remedial Action Confirmation report And Post-Remediation Health Risk Assessment Sites 16 And 17 Remedial Action, Basewide Remediation Sites, Former Fort Ord, California. Draft Final, April.</p> <p>Parsons, 2001. Draft Ordnance Detection and Discrimination Study (ODDS), Former Fort Ord, Monterey, California. August.</p> <p>USAEDH, 1993. Archives Search Report, Former Fort Ord, California, Monterey County, California. Prepared by US Army Corps of Engineers St. Louis District.</p> <p>USAESCH, 1997. Penetration of Projectiles Into Earth, An Analysis of UXO Clearance Depths at Ft. Ord. September 10. Appendix F of the Phase 2 EE/CA.</p>			

ATTACHMENT 2-A2

## ATTACHMENT 2-A2

### OE POTENTIALLY PRESENT OR FOUND AT THE SITE

Based on the interview records concerning past training at the site and dated material found in the disposal area, it is believed that potential OE associated with the site would be World War II vintage. Information concerning OE potentially used at the site (practice mines) and found at the site (2.36-inch practice rockets, rifle and smoke grenades) were obtained from The American Arsenal (*Hogg, 2001*).

#### Mines

Practice mines were likely to have been used for landmine warfare training in during the 1940s. The following presents a description of a World War II vintage practice mine.

M1 antitank practice mines were used in World War II. According to Headquarters Munitions Command data cards, these mines were produced between 1941 and 1945. The M1 consists of a mine body, spider, black powder charge, smoke charge, detonator, firing pin assembly, safety fork, fuze, shear pins, and steel filler ring. The steel filler ring is inserted in the mine body so that the M1 will equal the weight of the M1A1 and M4 mines. The fuze consists of a striker assembly and a body that contains the detonator. The firing pin is normally held away from the detonator by two steel balls. When the fuze is inserted and the spider attached, a pressure of 250 pounds on the spider is sufficient to activate the fuze. In the M1, the fuze sets off a smoke-puff charge; the charge produces smoke which escapes from the mine through the holes. The charge consists of 60 grains of army black powder, which ignites 100 grains of red phosphorous. The complete assembly weighs 10.67 pounds and is 8.2 inches in diameter and 4.25 inches high (*Hogg, 2001*).

#### Grenades

Parts to a rifle grenade and a 1945 smoke grenade were found during trenching activities at the site. HFA found a MK1A1 practice grenade during site sampling.

Rifle grenades are designed to be fired from a rifle or carbine by a launcher attached to the muzzle of the rifle. Rifle grenades are divided into high explosive (or service) and practice. The antitank grenades have a sheet steel body and tail assembly. The practice antitank grenade differs from the explosive/service grenade in that the fin is replaceable. Rifle fragmentation grenades consist of a fin stabilizer assembly with an impact-type fuze. The head consists of a hand grenade fuze body.

Smoke grenades – There is no designation of the model of smoke grenade that was found at the site. A 1997 training manual lists the following models of smoke grenades: AN-M8, M15, M18, M48, and M34. These are used to generate smoke for screening, ground-to-air signaling, and incendiary purposes. The AN-M8 contains HC smoke mixture, the M18 contains colored smoke. Both the M15 and M34 contain WP, both are sealed and have fuze wells into which the fuze is screwed. The fuze is a generally a pyrotechnic delay igniting fuze that contains a primer, first fire mixture pyrotechnic delay column, and ignition mixture. Assembled to the body are a striker, strike spring, safety lever, and safety pin with pull ring. The M48 consists of a rubber body and is used for training. The M34 has a serrated steel body.

MK1A1 practice hand grenade consists of a one-piece cast iron body and a removable safety pin and ring. It is inert. The grenade weighs 22 ounces.

## Rockets

Some 2.36-inch rockets were found during trenching activities at the site. Inert practice 2.36-rockets were also found during the soil removal program

2.36-inch practice rockets. These rockets are fired from a Bazooka-type launcher at ground targets. The rocket consists of a shell booster, disc, detonator, firing pin, safety pin, igniter trap, and nozzle and fin assembly.

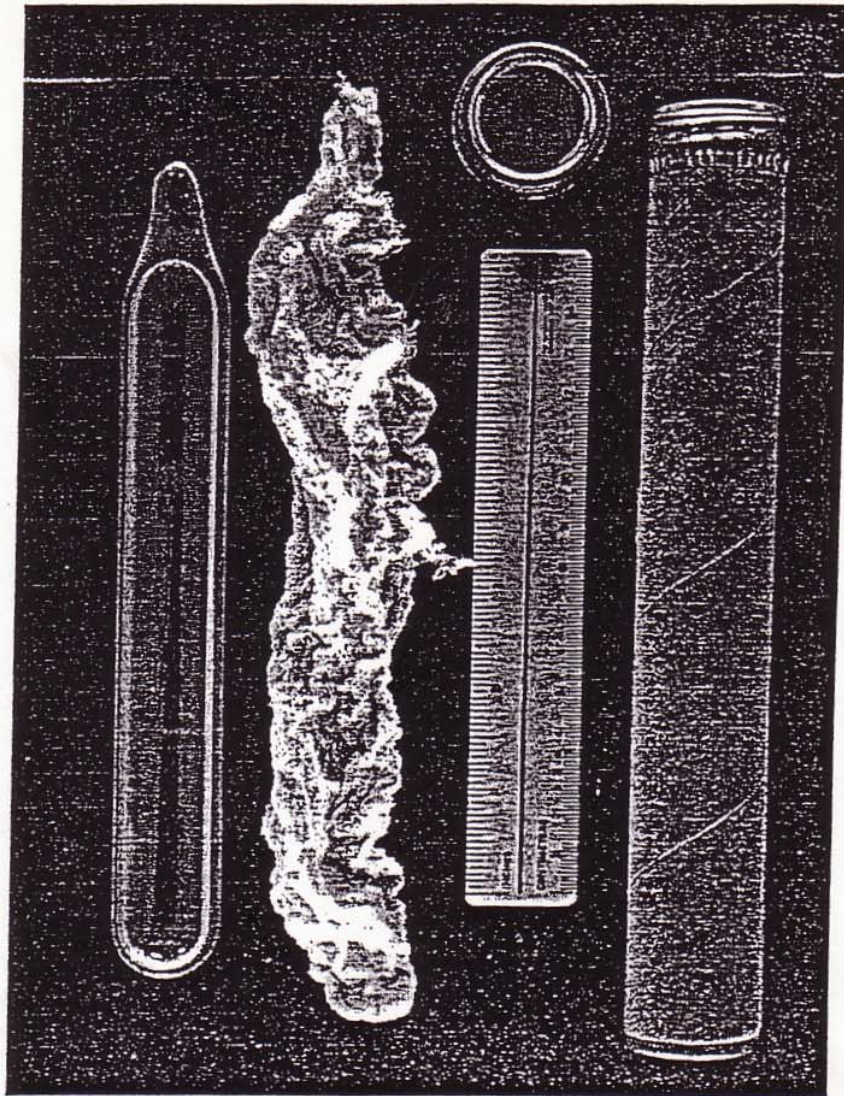
### *Chemical Agent Identification Sets (CAIS)*

Chemical agent identification sets (CAIS) generally contained a few dozen glass ampoules or bottles of chemical agent packed in a metal shipping container or wooden box. Based on the time period that OE-2 was used for chemical warfare training (1940s), it is possible that K941 toxic gas sets (M1) and K951/K952 instructional and detonation war gas identification sets may have been used at the site.

K941 toxic gas sets (M1) – These kits were available from WWII until the late 1950s. These kits contained 24 glass bottles, each containing 3 ½ ounces of mustard (H and HS) or distilled mustard (HD). Bottles were round and had a small plastic/bakelite top. Four bottles were packed in a ½ inch layer of sawdust within a sealed metal can that was 6 ½ inches high. The cans were pressure sealed and had a sardine-type key on the bottom. Six of these metal cans were fitted into a steel shipping cylinder that was 6 5/8 inches in diameter and approximately 38 inches long. The open end of the container was closed by a flanged end cover which was secured by 8 bolts tightened over a 1.8 inch thick lead gasket.

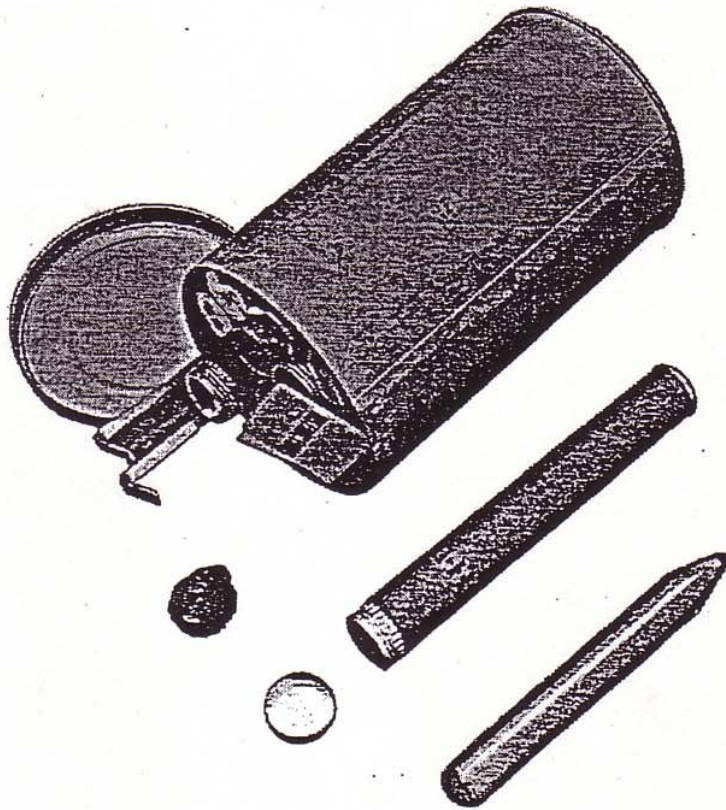
K951/K952 war gas identification instructional and identification detonation sets - M1 K951 war gas identification instructional and identification detonation sets have been found buried at Fort Ord. These contained 48 ampoules - 12 each of 2ml H in 38 ml of chloroform, ml L in 38 ml of chloroform, 40ml CG, and 20 ml of chloropicrin (PS). The only difference between the K951 and K952 kits is that the K953 was issued with blasting caps. These were packaged in a separate box.

ATTACHMENT 2-A3



D95-CCC/vskl.cdr  
11/10/95

Figure 11. K951/952 Ampule, Packing Material, and Cardboard Container



095-033mtube.cdr  
11/07/95

Figure 12. Multiple-Tube Container, Opened