

Fort Ord Environmental Cleanup 2012 ANNUAL REPORT

Fort Ord BRAC Office

August 2013

How is the cleanup progressing at the former Fort Ord? How much land has been turned over to the community? This annual report provides information to the community on the progress the Army has made through 2012.

The Army, in consultation with the U.S. Environmental Protection Agency (EPA), the California Department of Toxic Substances Control (DTSC), and the Regional Water Quality Control Board (RWQCB), carries out a major program to remedy environmental and safety problems left over from more than 75 years of

training operations at the former Fort Ord, which closed in 1994.

The cleanup program has two goals: (1) protect human health and the environment, and (2) transfer land to the community for other uses. The elements of the cleanup program are shown below.



MUNITIONS CLEANUP

The Army remains responsible for the cleanup of unexploded military munitions and explosives left over from the days when Fort Ord was used for military training. Most of the former Fort Ord has been cleaned up and made available for community use.

Cleanup continues on one large area known as the "Impact Area." Over the years, a variety of military munitions were used within the Impact Area including hand grenades, mortars, rockets, artillery projectiles, and small arms.

Much of the Impact Area is covered with thick vegetation known as Central Maritime Chaparral, which can grow as high as 15 feet tall. Before cleanup workers can conduct munitions removal activities, the brush has to be removed. Unexploded munitions or explosives on the surface of the land could detonate, causing serious injury if disturbed by someone walking on the land.

In 2002, after extensive study, a decision was made to use prescribed burns to remove brush so that workers can safely remove munitions and explosives of concern. Prescribed burns are the safest way to remove the vegetation. In addition, prescribed burns are better for the habitat than cutting the brush. Central Maritime Chaparral is home to a number of threatened or endangered species and is dependent on periodic burning to maintain the diversity and health of the habitat.

The map on page 2 shows where prescribed burns have occurred and cleanup conducted, as well as areas that may require additional investigation or response actions. There are a few areas, such as Units 11 and 12, where vegetation had to be cut. This was because the types of explosives found in Units 11 and 12 made it unsafe to use prescribed burns. During 2011 and 2012, vegetation

was removed by machine on Units 4, 11, and 12, and munitions cleanup was completed. At a later date, these areas will be burned to stimulate regrowth of the chaparral.

The Army plans to conduct prescribed burns in 2013 in the areas shown as Unit 7 and Unit 10 on the map.

The Army is working with Monterey Bay Unified Air Pollution Control District, the U.S. Environmental Protection Agency, and the California Department of Toxic Substances Control to conduct the prescribed burns in a manner that minimizes smoke impacts to the surrounding communities. If you have concerns about exposure to smoke, you may want to take reasonable precautions to avoid or reduce exposure during any burn. If you would like to receive fact sheets describing what you can do to avoid or minimize smoke exposure please contact the Fort Cleanup Office. If you pre-register, the Army will provide prior notice of any prescribed burns. Contact the Fort Ord Cleanup Office at (831) 393-1284, 1-800-852-9699, or go on-line at www.FortOrdCleanup.com.

In addition, to facilitate transfer and reuse, the Army transferred property to the Fort Ord Reuse Authority as part of an agreement known as the Environmental Services Cooperative Agreement (also called ESCA). In this 2007 agreement, the Fort Ord Reuse Authority committed to completing the evaluation of munitions and explosives of concern hazards on about 3,340 acres of the former Fort Ord and will take any remedial actions deemed necessary to protect human health and the environment with respect to munitions and explosives of concern based on the future uses. The Army provided funding to complete the munitions cleanup under the agreement.

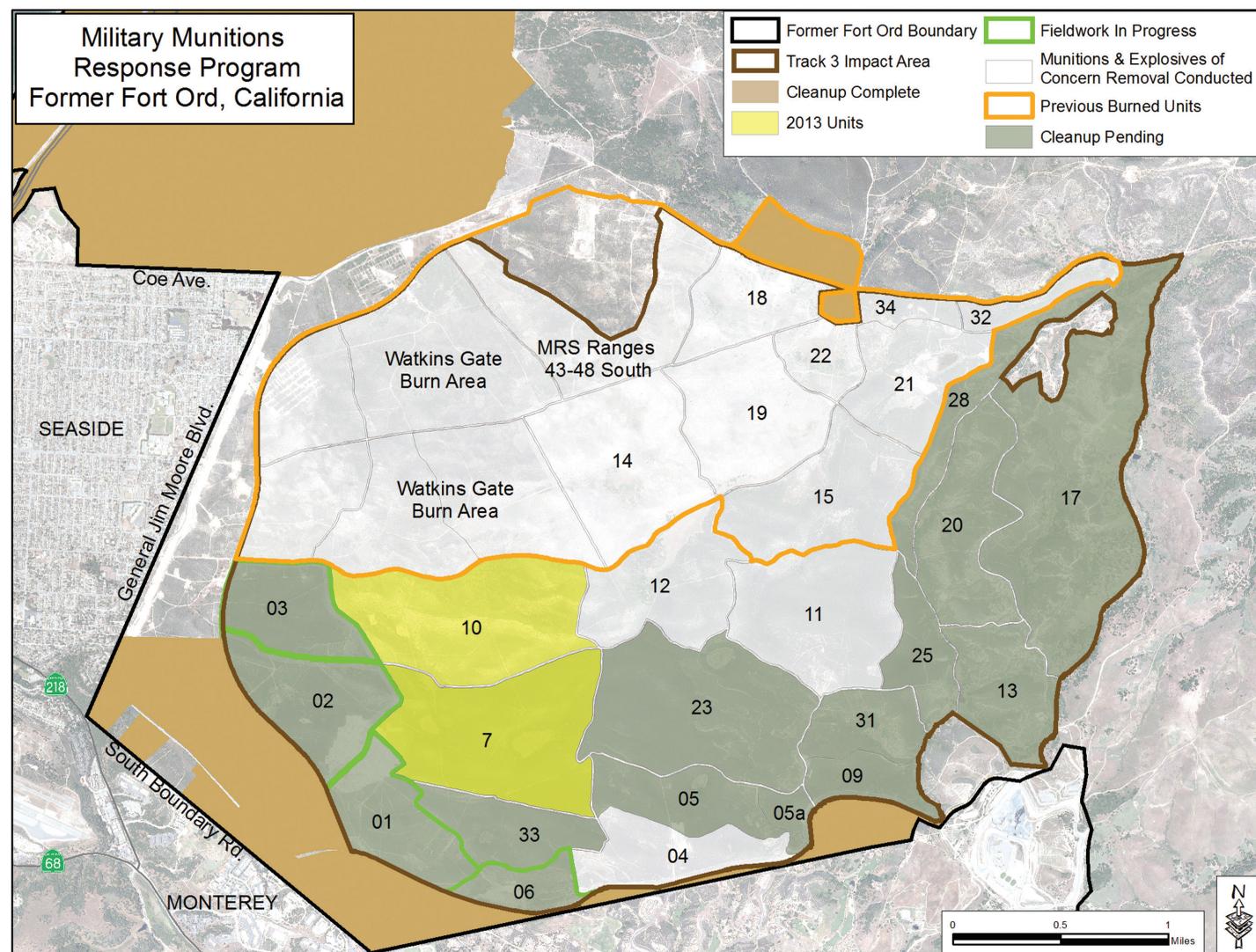
(Munitions Cleanup continues on next page)

PARA OBTENER UNA COPIA EN ESPAÑOL, CONTACTE: 831-393-1284

MUNITIONS CLEANUP PROGRESS MADE DURING 2012

In June 2011, the Army began preparation of Units 11 and 12 for prescribed burns by cutting fire containment lines. During site preparation, two types of large artillery projectiles were found on the ground surface, an unexpected event since these types of projectiles are generally found several feet deep. The potential presence of these items on the ground surface within the Units made these areas unsafe to burn. The items encountered required a much greater safety setback distance than had been anticipated which exceeded the Army's capabilities to conduct a safe prescribed burn. Because of this, the vegetation was cut followed by the safe removal of MEC on the surface in these areas. Later, when the vegetation grows back sufficiently to carry a fire, these two areas will be burned to encourage successful recovery of the rare, threatened and endangered fire-dependant plant species.

In 2012, the Army prepared Unit 10 for a prescribed burn, however, the required resources and burning conditions (including



Where prescribed burns have occurred and cleanup conducted, areas that may require additional investigation or response actions, and areas in which the Army plans to conduct prescribed burns in 2013.

appropriate weather) did not align and a burn was not conducted.

Finally, in 2012, the Army continued additional investigation of munitions and explosives of concern in other areas including fuelbreaks and Unit 4 inside the historic Impact Area (see map above), and other areas outside the historic Impact Area.

GROUNDWATER CLEANUP

Did you ever wonder where the water pumped from a well comes from? Water taken from the ground, or "groundwater," comes from rain water that soaks into the ground. Gravity pulls the water down into the ground, where it passes between particles of soil, sand, gravel, or rock until it reaches a depth where there is a layer of clay or impermeable rock, or the ground is saturated with water. Sometimes there are multiple layers of groundwater beneath the surface of the land, each separated by clay or some other barrier. These layers of water are called aquifers.

There are several sites on former Fort Ord land where chemicals were discarded on the surface of the land. These chemicals flowed through the soil contaminating the groundwater. Once these contaminants reached the groundwater they fanned out in the water, creating what is called a plume. Sometimes these pollutants contaminated not only the aquifer closest to the surface, but several aquifers deeper in the ground. The map on the following page shows the location of the contamination plumes on the former Fort Ord.

The Army has labeled these sites as indicated in the table (Table 1) on the right.

The Army is responsible for removing these chemicals from the groundwater. Typically this is done by drilling wells, pumping the water from the ground, treating the water in such a way that removes contaminants, then returning the treated/clean water back into the ground.

Cleanup of Operable Unit Carbon Tetrachloride Plume is

| NAME OF CONTAMINATED SITE | SOURCE OF CONTAMINATION | MAIN CONTAMINANT |
|--|--------------------------------------|-----------------------------|
| Sites 2/12 | Former auto/truck repair shop | Trichloroethylene (TCE) |
| Operable Unit 1 | Former fire department training area | Trichloroethylene (TCE) |
| Operable Unit 2 | Former landfill | Trichloroethylene (TCE) |
| Operable Unit Carbon Tetrachloride Plume | Equipment cleaning | Carbon Tetrachloride (CTCL) |

Table 1: Groundwater Contamination Sites on Former Fort Ord

using an innovative cleanup method called in-situ biodegradation. Microbes that live in groundwater like to eat certain chemicals, such as carbon tetrachloride. When microbes digest carbon tetrachloride, they change it into harmless gases, such as carbon dioxide and methane. Injecting lactate, a food product, into the groundwater speeds up the process of remediation by helping the microbes grow and multiply. Once the chemicals are cleaned up and the microbes have eaten all the food, the microbes die.

The table at the top of the next page shows the treatment as of December 31, 2012 for the various sites where groundwater contaminants were found.

Table 2: Groundwater Treatment Results as of December 31, 2012

| | Sites 2/12 | OU 1 | OU 2 / OUCTP |
|---------------------------------|---------------|---------------|---------------|
| Treatment started | April 1999 | July 1988 | October 1995 |
| Gallons treated | 1.620 billion | 313.2 million | 5.821 billion |
| Pounds of contaminants removed | 454 | 31 | 728 |
| Gallons of contaminants removed | 37 | 3 | 58 |

PROGRESS MADE DURING 2012

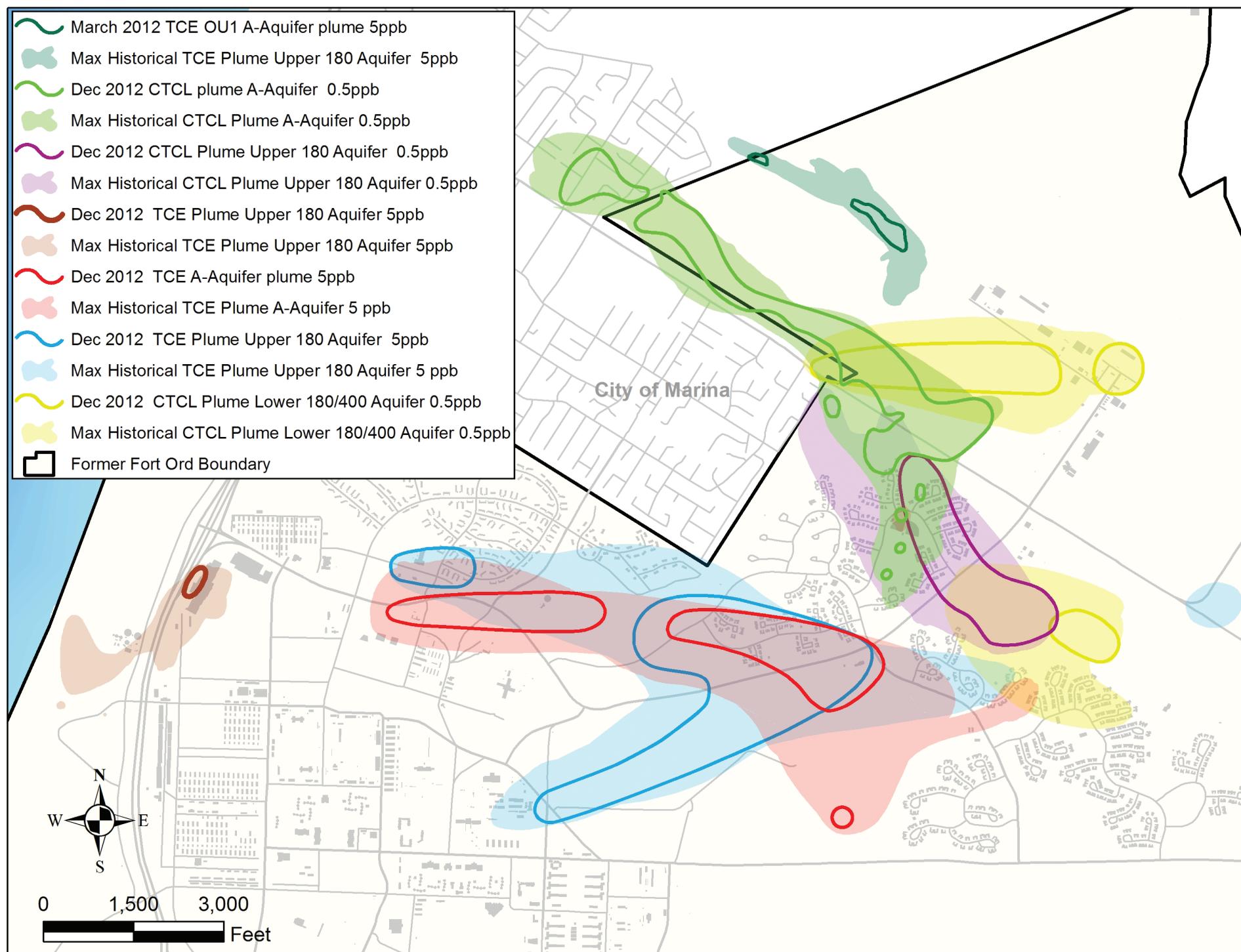
- Groundwater cleanup and treatment continued at all four cleanup areas. An investigation of soil gas was initiated for Sites 2/12 in 2012 and continues through 2013.
- Planning and evaluation continued to begin the relocation of the Operable Unit 2 groundwater treatment system. This

system will be moved to an area next to the Fort Ord landfills in 2014.

| 2012 Progress | Sites 2/12 | OU 1 | OU 2 / OUCTP |
|---------------------------------|-------------|------------|--------------|
| Gallons treated | 111,410,259 | 19,214,000 | 349,484,879 |
| Pounds of contaminants removed | 10 | 0.2 | 28.3 |
| Gallons of contaminants removed | 0.8 | 0.02 | 2.25 |

Table 3: Groundwater Treated Between January 1 and December 31, 2012

- How successful has the treatment been? The map below shows the reduction in size of the contaminant plumes over time.



The shaded areas in the above map show the size of the historical maximum extent of the plume. The colored lines are the outer boundaries of the current plumes. The cleanup and treatment program will continue for a number of years until the groundwater is in compliance with cleanup standards.

DRINKING WATER IS SAFE

Studies show extremely low concentrations of a contaminant known as TCE in three water supply wells used by the Marina Coastal Water District. The concentrations of TCE in the supply wells are well below the Federal and State Safe Drinking Water Act maximum contaminant levels. Water pumped from the Marina Coast Water District supply wells on Fort Ord consistently meets the drinking water safety standards established by the U.S. Environmental Protection Agency and the California Department of Public Health.

SOIL CLEANUP

The Army is responsible for cleaning up the soil, removing lead and other contaminants from former training areas in accordance with the Site 39 Inland Ranges Record of Decision Amendment.

PROGRESS MADE DURING 2012

Most areas of contaminated soil at the former Fort Ord have been cleaned up. For example, many tons of lead-contaminated soil were removed from the former firing ranges on the beach. This land has been turned over to the California Department of Parks and Recreation and opened in 2009 as Fort Ord Dunes State Park.

The one area that the Army continues to work on is known

as Site 39. Site 39 is roughly the same area known as the Impact Area, where other small arms ranges and explosives training ranges were located.

All the known contaminated areas in Site 39 have been cleaned up. These contaminated soils have been excavated and placed at the former Fort Ord landfill. They are placed on top of an impermeable membrane that covers the landfill. Another membrane was placed over the contaminated soil to prevent water from leaching metals and contaminants into groundwater. As the Army completes the munitions and explosives cleanup in the Impact Area, the Army will continue to investigate to determine if there are additional areas where soil cleanup needs to occur.

FORT ORD LANDFILL

From 1950 – 1987 Fort Ord operated its own landfill. Unfortunately, rainwater leached contaminants from the landfill, down into the groundwater. That is the contaminant source for the Operable Unit 2 groundwater cleanup. The cleanup of the groundwater began in 1995 and will continue for many years.

Since 1997, the landfill has been covered with an impermeable membrane that keeps rain water from reaching the contents of the landfill. This prevents further contamination of the groundwater from the landfill.

All landfills produce methane gas and the Fort Ord landfill is no exception. At certain concentrations methane gas can catch fire

or be explosive. The Army has installed vent pipes throughout the landfill to capture methane and feed it to a thermal treatment system. The Army maintains an extensive system of monitoring wells at the outer edges of the landfill which monitor for environmental compliance. This is particularly important on the east side of the landfill, which is the area closest to residences.

PROGRESS MADE DURING 2012

Soils from the Site 39 area were transported to the landfill prior to the installation of a second cover. Monitoring and maintenance continued at the landfill.

HABITAT MANAGEMENT

The lands at Fort Ord are rich in wildlife, including black-tailed deer, turkeys, bobcats, coyotes, snakes, red-tailed hawks, coast horned lizards, California quail and gray foxes. Fortunate visitors may even catch a glimpse of a badger, mountain lion, or golden eagle. Fort Ord land is home to many unique habitats where 22 rare, threatened, and endangered plant and animal species live.

Even while the cleanup program goes on, the Army must

manage the land to protect this unique habitat. Many cleanup actions could have impacts on habitats and listed species such as California Tiger Salamander or Monterey Spineflower. Each proposed action must be evaluated carefully for its potential impacts on sensitive species of plants and animals.

In 1997, the Army, the Bureau of Land Management, and other major users of Fort Ord property signed an agreement with the U.S. Fish & Wildlife Service to implement the Installation-Wide Multispecies Habitat Management Plan (HMP) designed to protect rare, threatened, and endangered species and their habitats at the former Fort Ord. The plan establishes guidelines for the conservation and management of plant and wildlife species and habitats that largely depend on Fort Ord land for survival. The plan includes requirements such as monitoring and reporting following the cleanup of contaminated sites to ensure a healthy recovery, management requirements such as creation of buffer zones around natural areas, control of invasive species and limitations to vehicle access.

The overall goals of the HMP are (1) to avoid any net loss of populations or important habitat for any of the species covered by the plan and (2) to promote preservation, enhancement, and restoration of habitat and populations of these species while allowing implementation of the community-based reuse plan.

PROGRESS MADE DURING 2012

Habitat management actions in 2012 included: baseline monitoring for annuals and shrubs in Units 6, 10, and portions of Units 2 and 3, first year monitoring for annuals in Units 4, 11, 12 and a portion of Unit 23, third year monitoring for annuals and shrubs in Units 14 and 19; restoration activities in several lead remediation areas, as well as reporting on the monitoring and restoration actions to U.S. Fish and Wildlife Service.



Checker Lilly (*Fritillaria affinis*)

PROPERTY TRANSFER

The transfer of property for community use is substantially complete. The majority of the remaining property to transfer is the land known as the "Impact Area." This land was formerly used for artillery and explosives training, and cleanup continues in this area. Once the cleanup is complete, this land will be transferred to the Bureau of Land Management and will be managed as a habitat reserve as part of the Fort Ord National Monument.

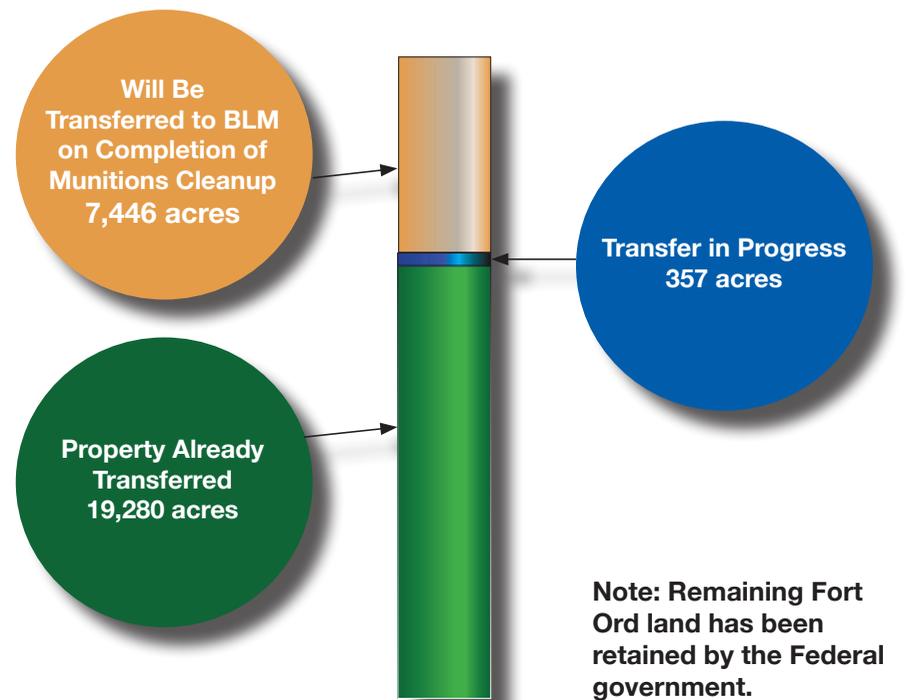
PROGRESS MADE DURING 2012

The Army solicited public comments in the Finding of Suitability to Transfer number 12, also called FOST 12 in August 2012. The FOST 12 property is intended to be transferred to the Fort Ord Reuse Authority (FORA), and the Monterey Bay Education, Science, and Technology Center of the University of California, Santa Cruz (UCMBEST), for mixed use, development, and habitat management.

While not specifically related to the Fort Ord Cleanup, on April 20, 2012, President Obama signed a Proclamation to designate the Fort Ord National Monument. In his proclamation, the President stated that, "The protection of the Fort Ord area will maintain its historical and cultural significance, attract tourists and recreationalists from near and far, and enhance its unique natural resources, for the enjoyment of all Americans."

The Fort Ord National Monument (approximately 14,651 acres) holds some of the last undeveloped natural wildlands on the Mon-

TRANSFER STATUS OF FORT ORD



terey Peninsula. Located on the former Fort Ord military base, the Bureau of Land Management protects and manages 35 species of rare plants and animals along with their native coastal habitats. Habitat preservation and conservation are primary missions for the Fort Ord Public Lands but there are also more than 86 miles of trails for the public to explore on foot, bike or horseback.

COMMUNITY OUTREACH

The Fort Ord Cleanup program conducts numerous community outreach activities. Detailed information about these activities is available by phoning (831) 393-1284 or 1-800-852-9699, or by visiting our web site at www.FortOrdCleanup.com.

One of the most popular outreach activities is a Community Involvement Mobile Workshop, pictured below left, that includes a bus tour of the former Fort Ord with presentations by cleanup staff. If you'd like to participate in one of these bus tours, please contact us.

Periodically we circulate a survey designed to provide us with information about how the community sees our outreach endeavors. This survey is included in this newsletter on page 7, and we invite you to complete it and send it to us. You can also complete the survey online at www.FortOrdCleanup.com.

Contact information for the Army and all the other agencies engaged in the cleanup program is provided on the back page. Please feel free to contact us with any questions.



Open house booth dedicated to habitat management and restoration

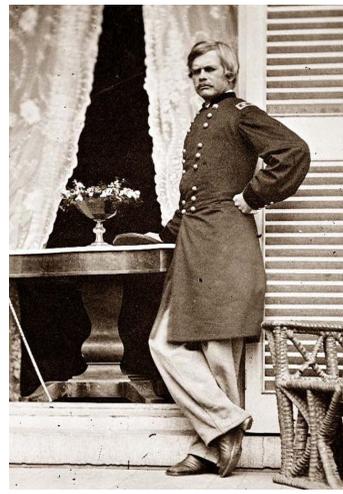


Community Involvement Mobile Workshop, August 2012, on the Fort Ord Landfill stop



Taking a few minutes to admire the view during a May 2013 nature walk

Then... ...and Now



Fort Ord served as a training facility from 1917–1994. Above left is the base’s namesake Maj. Gen. Edward Ord (1818–1883). At right, troops target practice on a range in the 1960s.



Cleanup work at Site 3 began in 1999.



Groundwater treatment facilities were installed at Operable Units 1 (above left) and 2 (right) in 1988 and 1995, respectively, and at Sites 2/12 (above center) in 1999.



In 1997, landfill cleanup and cover construction began. In 2005 and 2006, a gas extraction system and thermal treatment unit were installed.



In addition to land transferred to local entities, in 2009 a large swath of beachfront property became Fort Ord Dunes State Park (above). At a 2012 ceremony (right), over 14,000 acres were declared the Fort Ord National Monument.



| | | | |
|------------------|--|------------------|---|
| 1917-1994 | Fort Ord used as a training facility | 2003 | Site 39 Soil Cleanup initiated |
| 1988 | Groundwater treatment facility installed at Operable Unit 1 | 2005 | Landfill gas extraction system installed at former landfill |
| 1990 | Sites at Fort Ord identified as requiring environmental cleanup as part of the Superfund Program | 2006 | Landfill gas thermal treatment unit installed |
| 1991 | Fort Ord identified for base closure | 2007-2008 | Army transferred 3,337 acres to the Fort Ord Reuse Authority and signed the Environmental Services Cooperative Agreement (munitions cleanup by Fort Ord Reuse Authority in these transferred lands) |
| 1993 | Army begins investigation and removal of munitions | 2008 | Army enhanced Operable Unit 1 groundwater treatment system |
| 1994 | Fort Ord closed as Army training center | 2009 | Army transferred beachfront property to the California Department of Parks and Recreation — transferred property became Fort Ord Dunes State Park |
| 1995 | CSUMB opened on former Fort Ord land | 2012 | Over 14,000 acres of Fort Ord declared the Fort Ord National Monument |
| 1995 | Groundwater treatment facility installed at Operable Unit 2 | 2012 | Initiated soil vapor investigation at Site 2/12 |
| 1996 | First land transferred to Bureau of Land Management | | |
| 1997 | Landfill cover construction began | | |
| 1998 | Army began soil cleanup at several sites across Fort Ord | | |
| 1999 | Groundwater treatment facility installed at Sites 2/12 | | |

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Fort Ord Environmental Cleanup

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