



## **FINAL OPERATIONAL RANGE ASSESSMENT PROGRAM REPORT SIERRA ARMY DEPOT, CALIFORNIA**

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To meet Department of Defense (DoD) requirements and support the United States (U.S.) Army's Sustainable Range Program, the Army is conducting the Operational Range Assessment Program (ORAP) to determine whether a release or substantial threat of release of munitions constituents of concern (MCOC) from an operational range to an off-range area creates a potentially unacceptable risk to human health or the environment. The initial ORAP assessment—Phase I—is a qualitative evaluation of whether: (a) an MCOC source existed on the operational range footprint, (b) there is a potential migration mechanism, and (c) human or sensitive ecological receptors are present. Conclusions from the Phase I place each operational range into one of two categories: Unlikely or Inconclusive. Operational range areas categorized as “Unlikely” are those where there is sufficient evidence to show that there are no known releases or source-receptor interactions that could present an unacceptable risk to human health or the environment, based on a review of the information available; no further action needs to be taken for these ranges at this time and the installation is placed into a periodic five-year review cycle. Operational range areas categorized as “Inconclusive” are those where existing information either is insufficient to make a source-receptor interaction determination, or indicates the potential for such interaction to be occurring. Sites with ranges categorized as Inconclusive are recommended for further evaluation by conducting an ORAP Phase II assessment.

The ORAP Phase II assessment re-evaluates whether the source-receptor pathway identified during Phase I is complete, identifies any new information that may impact the Phase I's conclusions, and as necessary involves a quantitative assessment consisting of the collection and laboratory analysis of environmental media to determine whether MCOC are potentially leaving an operational range footprint by an identified pathway (e.g., groundwater or surface water) and pose a potential risk to off-site receptors.

This ORAP Phase II Report assesses source-receptor pathways identified at Sierra Army Depot, California. EA Engineering, Science, and Technology, Inc. (EA) conducted this evaluation under contract W9128F-10-D-0056 to the U.S. Army Corps of Engineers (USACE)-Baltimore District.

Sierra Army Depot is located in the Honey Lake Valley of Lassen County, in northeastern California, four miles west of the Nevada State line. In 1933, 60,523 acres were acquired for Sierra Army Depot by the U.S. Army for use as the Honey Lake Bombing Range by the U.S. Army Air Corps. Additional lands were acquired for an upper burning ground, eventually increasing Sierra Army Depot to 96,792 acres by 1957. Historical ranges at Sierra Army Depot included an aerial bombing and gunnery range, open burning/open detonation areas, training and testing ranges, airfield operations, and areas for shipping, receiving, and storage of military munitions and other supplies.

A series of Base Realignment and Closure Office decisions in 1995 and 2005 reduced the size and mission of Sierra Army Depot. Sierra Army Depot currently encompasses 36,096 acres and includes 10 operational ranges totaling 4,805 acres. These operational ranges include three maneuver training areas, two small caliber firing ranges, one grenade range, one demolition range, one obstacle course, one runway, and one drop zone. The remaining acreage consists of the Upper Burning Ground, being addressed under the Military Munitions Response Program (MMRP), and non-operational area on the Main Depot.

A Phase I Qualitative Assessment was completed for Sierra Army Depot in 2008. The Phase I concluded there was insufficient information to determine if potential MCOC from current and historical munitions use could migrate off-installation via surface water and interact with potential off-range ecological receptors at concentrations that pose an unacceptable risk. Therefore, two operational ranges (one small arms range and one adjacent grenade launcher range) were categorized as Inconclusive during the Phase I.

During the Phase II, Phase I data was re-evaluated, a Phase II site reconnaissance was conducted, and updated information collected during the Phase II was reviewed. It was determined that the Phase I Inconclusive ranges be re-categorized as Unlikely because the surface water pathway to potential off-range receptors was found to be incomplete. The determination that a surface water pathway is unlikely is based on the information presented below.

MMRP sampling data from 2005 and 2012 pertaining to potential MCOC from soil sampling locations adjacent to the Inconclusive area were re-evaluated in relation to ORAP screening levels to determine if it could be concluded that MCOC was migrating from the Inconclusive range area, or if MCOCs detected in the MMRP areas are associated with historical ranges. Only one sample from the 2012 data was found to be located near, and potentially downgradient of, the Inconclusive ranges. This sample had no concentrations of potential MCOC above ORAP screening levels.

During the Phase II site reconnaissance, it was noted that the small arms range berm was not vegetated and showed significant signs of erosion. Sparse vegetation was observed at the grenade launcher range. No evidence of over shot was observed at the berm, but some munitions debris were noted behind the impact berm, close to the range boundary and are assumed to be associated with the historical .50 caliber and surveillance test site within the MMRP boundaries. The terrain in the Inconclusive range area was primarily flat with few well defined channels where water flows during periods of increased precipitation. A large on-range depression was identified immediately behind the berm (west) of the small arms range. Surface water runoff from the impact berm was observed to flow through various channels and ultimately discharge into the on-range depression where it evaporates. The drainage channels observed around the impact berm increase in width and depth closer to the on-range depression and alluvial deposits were noticed where the channels discharge into the on-range depression. It was determined that drainage in the area of the berm is towards the on-range depression (the lowest point in the Inconclusive range area), and does not flow off-range. Additionally, numerous mud cracks were observed in the on-range depression indicating that water pools in the area and subsequently evaporates. Closer to the range boundary, the channels dissipated and there was no evidence of surface water flow to off-range areas. Minimal wetland vegetation (desert saltgrass) was observed within the Inconclusive range area providing validity to the presence of intermittent wetlands. However, due to the lack of surface water and surface water drainage pathways off-range, MCOC is not expected to migrate off-range and pose an unacceptable risk to potential off-range ecological receptors (intermittent wetlands).

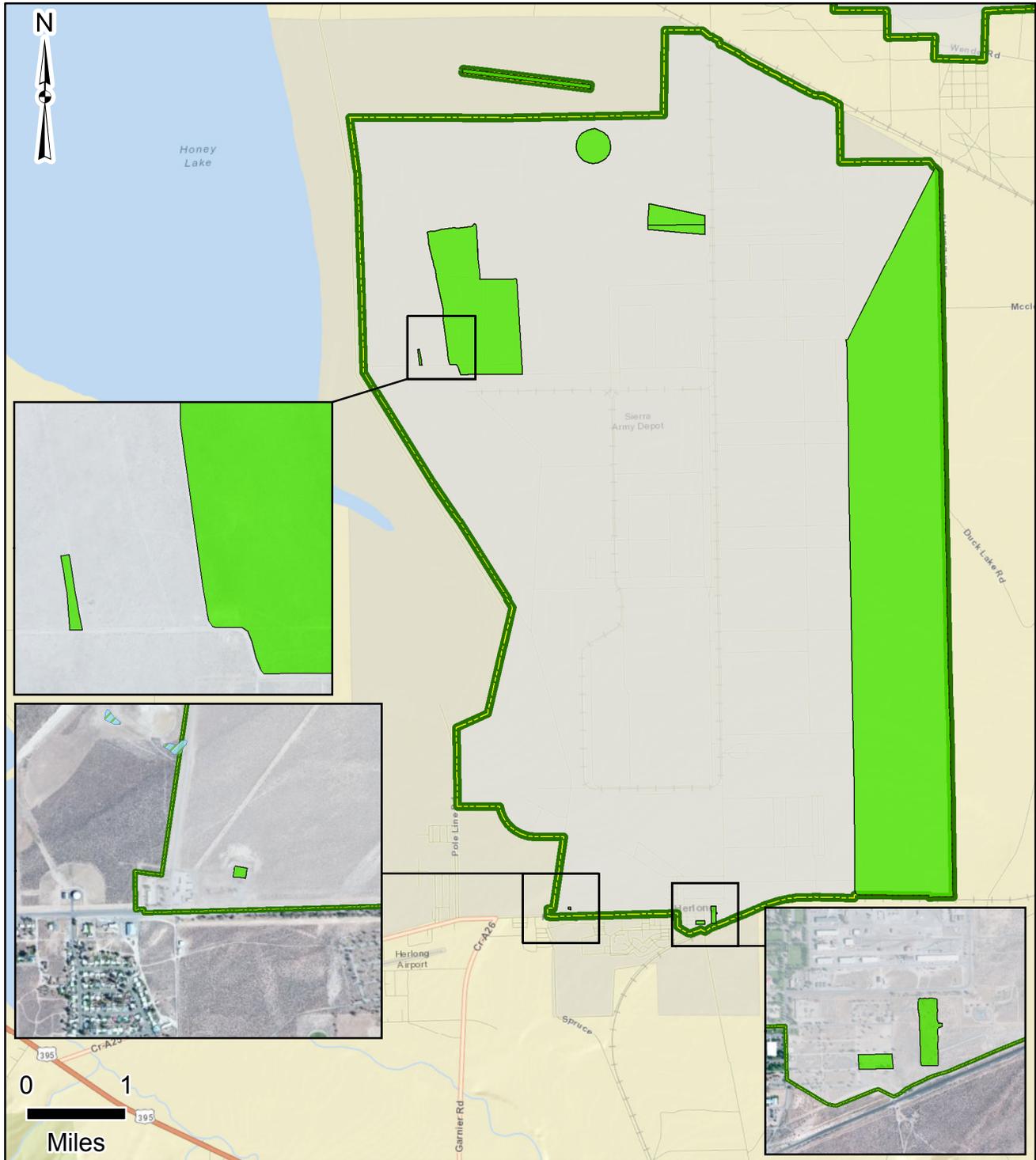
Based on information obtained during the Phase II, it was determined that it is unlikely that potential MCOC could migrate from the Inconclusive range area. On-range surface water drainage and erosion from the impact berm drain into the on-range depression behind (west) the berm and do not flow off-range. When present, surface water stays on-range and eventually evaporates; therefore, the potential surface water pathway to ecological receptors is Unlikely and no sampling effort was required for this Phase II. The two Inconclusive ranges were re-categorized as Unlikely and placed into the Periodic Review program (**Figure 1**).



Operational Range Assessment Program  
Phase II Quantitative Assessment  
Sierra Army Depot, CA



Figure 1  
Phase II Summary



Installation Data

- Installation Boundary
- Non-Operational Area

Military Range Category

- Unlikely

Data Sources:  
ArcGIS Online Services 2012  
SIAD 2012  
ARID-GEO, June 2006

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