

**FINAL  
OPERATIONAL RANGE ASSESSMENT PROGRAM  
PHASE I QUALITATIVE ASSESSMENT REPORT  
MACON TRAINING SITE  
MACON, MISSOURI**

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Prepared for:

**UNITED STATES ARMY CORPS OF ENGINEERS, BALTIMORE DISTRICT**  
P.O. Box 1715  
Baltimore, Maryland 21203

and

**UNITED STATES ARMY ENVIRONMENTAL COMMAND**  
Aberdeen Proving Ground, Maryland 21010

Prepared by:

**MALCOLM PIRNIE, INC.**  
3101 Wilson Boulevard  
Suite 550  
Arlington, Virginia 22201



## ABBREVIATIONS/ACRONYMS

ARID-GEO	Army Range Inventory Database-Geodatabase
CSM	Conceptual Site Model
DNT	Dinitrotoluene
DoD	Department of Defense
DODI	Department of Defense Instruction
DoDIC	Department of Defense Instruction Code
E	Ecological receptors identified. (This refers to range grouping; pathway designation always precedes E designation.)
GIS	Geographic Information System
GW	Groundwater pathway identified. (This refers to range grouping; M designation always precedes GW designation.)
H	Human receptors identified. (This refers to range grouping; pathway designation always precedes H designation.)
HMX	Cyclotetramethylenetetranitramine
ITAM	Integrated Training Area Management
LS	Limited Source
M	Munitions used. (This refers to range grouping; M designation always precedes applicable pathway.)
MCOC	Munitions Constituents of Concern
mm	Millimeters
MOARNG	Missouri Army National Guard
MoDNR	Missouri Department of Natural Resources
N/A	Not Applicable
NG	Nitroglycerine
ORAP	Operational Range Assessment Program
PETN	Pentaerythritoltetranitrate
PU	Pathway unlikely or incomplete. (This refers to range grouping; M designation always precedes PU designation.)
RDX	Cyclotrimethylenetrinitramine
RFMSS	Range Facility Management Support System
SW	Surface water pathway identified. (This refers to range grouping; M designation always precedes SW designation.)
TNT	Trinitrotoluene
TS	Training Site
U.S.	United States
USACE	United States Army Corps of Engineers
USACHPPM	United States Army Center for Health Promotion and Preventive Medicine
USAEC	United States Army Environmental Command
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

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## **EXECUTIVE SUMMARY**

The United States (U.S.) Army is conducting qualitative assessments at operational ranges to meet the requirements of Department of Defense policy and to support the U.S. Army Sustainable Range Program. The operational range qualitative assessment (hereinafter referred to as Phase I Assessment) is the first phase of the U.S. Army Operational Range Assessment Program (ORAP). This Phase I Assessment evaluates the operational range area at Macon Training Site (TS) to assess whether further investigation is needed to determine if potential munitions constituents of concern (MCOC) are or could be migrating off-range at levels that may pose an unacceptable risk to human health or the environment. In conducting the Phase I Assessment, MCOC sources, potential off-range migration pathways, and potential off-range human and ecological receptors are evaluated as appropriate.

Macon TS is located in Macon County in north-central Missouri, approximately three miles southwest of the city of Macon. The installation area consists of four noncontiguous parcels: Bakers Acres (1,231.13 acres), Wooly Acres (614.45 acres), South 61 (1,222.43 acres), and the South 61 Annex (24.30 acres), for a total of 3,092.31 acres. Previously, these parcels were owned by Peabody Coal and later by Associated Electric Cooperative, Inc., and were strip-mined for coal in the 1940s and 1950s, and possibly extending into the 1980s (MOARNG, 2001). The Missouri Army National Guard received these parcels in 1989 and 1990 from Associated Electric, as a gift to the State of Missouri. Mine reclamation was not performed at Macon TS, leaving the site covered with large areas of mine spoils and numerous lakes.

As part of the Operational Range Inventory Sustainment, an update to the Army Range Inventory Database-Geodatabase (ARID-GEO) was submitted to the U.S. Army Environmental Command in October 2006 (ARID-GEO [2006]). The ARID-GEO (2006) identified 20 operational range areas totaling approximately 3,105 acres in the four parts of Macon TS. In ARID-GEO (2006), several of the ranges overlap; hence, the sum of individual range areas is greater than the total operational range area. The entire Macon TS property is identified as operational area; no other than operational area exists at Macon TS. Training activities conducted at Macon TS include the use of weapons firing points, firing ranges, demolition ranges, and training and maneuver areas (ARID-GEO, 2006). During the ORAP site visit to Macon TS, it was determined that one of the ranges (gas chamber) identified in ARID-GEO (2006) does not exist. Thus, there are only 19 operational ranges at Macon TS.

A review of available records and background data, as well as interviews with installation personnel, indicated that limited amounts of military munitions have been used at the ranges at Macon TS. Historically, training conducted at Macon TS consisted of exercises using small arms blanks, field operations with occasional use of pyrotechnics and obscurants, and demolition training. Military training operations have been reduced at Macon since 2004 due to troop deployments. Because training activities have involved limited use of military munitions over large areas, or only on a few occasions at the demolition range, there are only limited sources of potential MCOC at Macon TS.

Primarily, MCOC sources identified at Macon TS consist of a demolition range. In general, MCOC from primary source areas potentially impact the following source media: soil at the demolition range. MCOC can be released to groundwater by leaching from soil. Once potential MCOC reach the groundwater they are not expected to migrate off range at concentrations that pose an unacceptable risk to human or ecological receptors.

The 19 operational ranges at Macon TS are categorized as Unlikely.

**Unlikely – Five-Year Review**

Nineteen ranges at Macon TS are categorized as Unlikely, totaling 3,104.32 acres<sup>2</sup>. These ranges consist of training and maneuver areas, small arms ranges, bivouac sites, observation towers, and a demolition range. Ranges where, based upon a review of readily available information, there is sufficient evidence to show that there are no known releases or source-receptor interactions off-range that could present an unacceptable risk to human health or the environment are categorized as Unlikely. Ranges categorized as Unlikely are required to be re-evaluated at least every five years. Re-evaluation may occur sooner if significant changes (e.g., change in range operations or site conditions, regulatory changes) occur that affect determinations made during this Phase I Assessment.

**Table ES-1** summarizes the Phase I Assessment findings.

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<sup>1</sup> The total operational range area was derived from the Operational Use Area (total range area) acreage as reported in ARID-GEO (2006).

**Table ES-1: Summary of Findings and Conclusions for Macon TS**

Category	Total Number of Ranges and Acreage	Source(s)	Pathway(s)	Human Receptors	Ecological Receptors	Conclusions and Rationale
Unlikely	19 operational ranges; 3,104.32 acres	Demolition range surface soils	Overburden aquifers (spoil, alluvium, and glacial drift), and shallow bedrock aquifers	None	None	Re-evaluate during the five-year review. Limited or no source was identified or no receptors exist (see Section 5.2 for details).
		Limited or no source—limited or no military munitions use	Not evaluated (limited or no source identified)			