



FINAL

Operational Range Assessment Program
Phase I Qualitative Assessment Report
Gunpowder Military Reservation, Maryland
U.S. Army Operational Range Assessment Program
Qualitative Operational Range Assessments

Prepared for:
U.S. Army Environmental Command and
U.S. Army Corps of Engineers Baltimore District



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ABBREVIATIONS/ACRONYMS

ARID-GEO	Army Range Inventory Database-Geodatabase
Bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
DNR	Department of Natural Resources
DoD	Department of Defense
DODI	Department of Defense Instruction
E	Ecological receptors identified. (This refers to range grouping; pathway designation always precedes E designation.)
ERDC	Engineer Research and Development Center
GMR	Gunpowder Military Reservation
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.)
LS	Limited Source
M	Munitions used. (This refers to range grouping; M designation always precedes applicable pathway.)
MCOG	Munitions Constituents of Concern
MDARNG	Maryland Army National Guard
MDE	Maryland Department of the Environment
mg/kg	Milligrams Per Kilogram
NG	Nitroglycerin
ORAP	Operational Range Assessment Program
OSWER	Office of Solid Waste and Emergency Response
PU	Pathway unlikely or incomplete. (This refers to range grouping; M designation always precedes PU designation.)
RFMSS	Range Facility Management Support System
SW	Surface water pathway identified. (This refers to range grouping; M designation always precedes SW designation.)
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
WP	White Phosphorus
°F	Degrees Fahrenheit
µg/L	Micrograms Per Liter

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 Gunpowder Military Reservation (GMR) 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.

GMR occupies 243.67 acres in northern Baltimore County, and is located approximately 15 miles north of Baltimore, in Glen Arm, Maryland.

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 November 2006 (ARID-GEO, 2006). The ARID-GEO (2006) identified 11 operational range areas encompassing 229.80 acres. A total of 13.87 acres was identified as non-operational acreage, including an armory, parking lots, and several buildings. Training activities conducted at GMR include small arms firing, light maneuver training, rappel training, and obstacle course training (ARID-GEO, 2006).

MCOC sources identified at GMR consist of metals and nitroglycerin from four small caliber firing ranges. In general, MCOC from primary source areas potentially impact soil. Potential MCOC may then migrate off-range via surface water and groundwater pathways to interact with human and ecological receptors.

In 2001, the U.S. Army Corps of Engineers collected a series of soil and sediment samples throughout the installation. Sample locations were selected to represent background soil conditions, areas most likely to be affected by range operations, and areas down gradient of range operations that could indicate transport of contaminants toward the unnamed lake located on the installation. Sampling showed that concentrations of antimony, arsenic, copper, and lead decreased as distance from source areas increased. This sampling, coupled with water quality analysis sampling occurring in the surface water system located just off-range and down gradient of GMR, demonstrates that although a surface water pathway for off-range migration exists at GMR, it is unlikely that potential MCOC has migrated off-range at concentrations that pose an unacceptable risk to human health and the environment.

Water samples collected from on-site sinks from 1994 to 2005 contained concentrations of lead and copper above their respective safe drinking water criteria; however the elevated concentrations were attributed to copper piping and lead solder in the water distribution system (Penniman & Brown, 1997). Laboratory results of samples collected from on-site sinks for lead and copper testing from 2007 and for January to June 2008 did not exceed action levels. No laboratory testing results for lead and copper were available for 2006. Due to elevated concentrations of metals in the sink samples, water was drawn directly from the on-site well in 1997, and was sampled for metals, including antimony, copper, and lead. The laboratory results indicated that no metals were detected in the sample analyzed from the well.

Based on the soil chemistry, the results of the 1997 well sampling, and the results of the sink sampling conducted in 2007 and 2008, migration of MCOC into the groundwater pathway at a level significant to adversely affect human health is unlikely.

The 11 operational ranges at GMR are categorized as Unlikely.

Unlikely – Five-Year Review

Eleven ranges at GMR are categorized as Unlikely, totaling 229.80 acres. These ranges consist of small arms firing, light maneuver training, rappel training, and obstacle course training. 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.

Table ES-1: Summary of Findings and Conclusions for Gunpowder Military Reservation

Category	Total Number of Ranges and Acreage	Source(s)	Pathway(s)	Human Receptors	Ecological Receptors	Conclusions and Rationale
Unlikely	11 operational ranges; 229.80 acres	No source—limited or no military munitions use	Not evaluated (no source identified)			Re-evaluate during the five-year review. Existing sampling data did not show potential for unacceptable risk to a receptor.
		Firing points, and back stop impact berms	Groundwater to off-site surface water	Consumers of potable groundwater, and recreational users of surface water	Threatened and endangered species, and off-range wetlands.	Re-evaluate during the five-year review. Existing sampling data did not show potential for unacceptable risk to a receptor.