

**FINAL
OPERATIONAL RANGE ASSESSMENT PROGRAM
PHASE I QUALITATIVE ASSESSMENT REPORT
ABERDEEN PROVING GROUND
ABERDEEN, MARYLAND**

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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 Aberdeen Proving Ground (APG) 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.

APG encompasses approximately 72,175 acres along the Chesapeake Bay in southern Harford and northeastern Baltimore counties, Maryland. According to the Army Range Inventory Database-Geodatabase (ARID-GEO) (2006), the installation's operational range footprint includes 63 operational range areas encompassing 66,313 acres. The footprint also includes a Resource Conservation and Recovery Act (RCRA) permitted open burn / open detonation (OB/OD) area and training area which is being addressed under the Military Munitions Response Program (MMRP). These ranges, which are composed of 176 and 388 acres respectively, are not assessed under the ORAP. An additional 5,298 non-operational acres were identified, including two geographically distinct cantonment areas which are located within the Aberdeen and Edgewood areas of the installation, respectively.

Since 1917, APG has served as the primary research, development, testing, and evaluation (RDT&E) center of Army material, personnel training including maneuver and live-fire training, and weapons qualifications. APG is also considered the primary site for all U.S. Department of Defense chemical defense research, development, and testing.

Primary MCOC source areas identified at APG consist of current and historical RDT&E impact areas, RDT&E ranges, multi-use ranges, small arms ranges, and maneuver and training areas. In general, MCOC from these primary source areas potentially impact the following source media: (1) soil (e.g., impact berms, impact areas surrounding targets), (2) groundwater, and (3) surface water / sediment (e.g., direct deposition into streams and wetlands).

As confirmed by various sampling investigations, MCOC can be released from source media to groundwater and surface water / sediment via a variety of release mechanisms. Release mechanisms for soil may include leaching from soil to groundwater or soil erosion and runoff to nearby streams. Once potential MCOC are deposited in surface water / sediment, they have the potential to migrate downstream, infiltrate into the shallow groundwater, or be taken up by aquatic plants or animals.

The primary human receptors identified are users of potable water from off-installation wells and participants in recreational activities in off-range surface waters downstream of the installation. The primary ecological receptors are the Chesapeake Bay as well as down gradient sensitive environments, which provide habitat for special status species located in areas down gradient and off-range of APG's land and water range areas.

Multiple investigations have assessed the presence of MCOC in the surface water and sediment of APG's Water Impact Areas. The results indicate that MCOC are not present at concentrations of concern in on-range source and pathway areas. Additionally, based on analytical results and the

placement of a drinking water treatment system, there are no source receptor interactions from potable well use off-range. As a result, the 63 operational ranges at APG are categorized as Unlikely.

Unlikely – Five-Year Review

A total of 63 ranges at APG are categorized as Unlikely, totaling 66,313 acres. These ranges consist of an airfield, RDT&E ranges, maneuver training areas, impact areas, and a Fire (Suppression) Training Area. 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.

Based on data collected during the Phase I Assessment regarding current and historical MCOC sources, potential migration pathways from ranges, and potential off-range human and/or ecological receptors, the operational ranges at APG have been placed into the following range groupings.

Group LS

The range identified in Group LS has no sources of potential MCOC that were identified during the Phase I Assessment.

Group MSW (H/E)

The 57 ranges identified in Group MSW (H/E) have current and historical sources of potential MCOC that were identified during the Phase I Assessment. These sources have the potential to migrate off-range via leaching, infiltration, erosion/runoff, and recharge/discharge of groundwater and surface water. Multiple investigations have assessed the presence of MCOC in the surface water and sediment of APG's Water Impact Areas. Based on the absence of elevated MCOC concentration in these on-range areas, the distance of on-range source areas from off-range areas of the bay, and the volume of flow from APG in relation to flow in the Chesapeake Bay, it is thought that potential MCOC associated with Group MSW (H/E) would not reach off-range human or ecological receptors at levels high enough to pose a viable risk via surface water pathways.

Group MSW (H/E) GW (H)

The five ranges identified in Group MSW (H/E) GW (H) have current and historical sources of potential MCOC that were identified during the Phase I Assessment. These sources have the potential to migrate off-range via leaching, infiltration, erosion/runoff, and recharge/discharge of groundwater and surface water. Multiple investigations have assessed the presence of MCOC in the surface water and sediment of APG's Water Impact Areas. Based on the absence of elevated MCOC concentration in these on-range areas, the distance of on-range source areas from off-range areas of the bay, the volume of flow from APG in relation to flow in the Chesapeake Bay, and the implementation of treatment and monitoring programs, it is thought that potential MCOC associated with Group MSW (H/E) GW (H) would not reach off-range human or ecological receptors at levels high enough to pose a viable risk via surface water or groundwater pathways.

Table ES-1 summarizes the analysis supporting the conclusion that APG's ranges are unlikely to present an unacceptable risk to human health or the environment.

Table ES-1: Summary of Findings and Conclusions for Aberdeen Proving Ground

Category	Total Number of Ranges and Acreage	Source(s)	Pathway(s)	Human Receptors	Ecological Receptors	Conclusions and Rationale
Unlikely	1 operational range; 226 acres	No source—limited or no military munitions use	Not evaluated (no source identified)			Re-evaluate during the five-year review. No source was identified.
	57 operational ranges; 63,590 acres	Firing points, impact areas, small arms firing, and training and maneuver areas	Delph, Mosquito, Woodrest, Abbey, Cod, Back, Wright, Swaderick, Monks, Lauderick, Coopers, Watson, Boones, and Romney creeks; Spesutie Narrows; Bush River; Gunpowder River; and a portion of the Chesapeake Bay	Down gradient recreational users	Down gradient Chesapeake Bay, Wetlands, and Special Status Species	Re-evaluate during the five-year review. No viable health risk to down gradient human and ecological receptors was identified.
	5 operational ranges; 2,497 acres	Firing points, impact areas, small arms firing, and training and maneuver areas	Romney Creek, Sod Run, and shallow surficial aquifer	Down gradient potable water and recreational users	Down gradient Chesapeake Bay, Wetlands, and Special Status Species	Re-evaluate during the five-year review. No viable health risk to down gradient human and ecological receptors was identified.

ABBREVIATIONS/ACRONYMS

APG	Aberdeen Proving Ground
ARID-GEO	Army Range Inventory Database-Geodatabase
ATC	Aberdeen Test Center
ATSDR	Agency for Toxic Substances and Disease Registry
CAP	City of Aberdeen Production
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
CWA	Chemical Warfare Agent
DNT	Dinitrotoluene
DoD	Department of Defense
DODI	Department of Defense Instruction
DSHE	Directorate of Safety, Health, and Environment
DU	Depleted Uranium
E	Ecological receptors identified. (This refers to range grouping; pathway designation always precedes E designation.)
ESRI	Environmental Systems Research Institute, Inc.
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.)
HCP	Harford County Production
HMX	Cyclotetramethylenetetranitramine
IMCOM	Installation Management Command
IRP	Installation Restoration Program
LS	Limited Source
M	Munitions used. (This refers to range grouping; M designation always precedes applicable pathway.)
MCOC	Munitions Constituents of Concern
MEC	Munitions and Explosives of Concern
mg/kg	Milligrams per Kilogram
mg/kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
mm	Millimeters
NG	Nitroglycerin
NRCS	Natural Resources Conservation Service
OB/OD	Open Burn / Open Detonation
ORAP	Operational Range Assessment Program
ORIS	Operational Range Inventory Sustainment
PETN	Pentaerythritoltetranitrate
PU	Pathway unlikely or incomplete. (This refers to range grouping; M designation always precedes PU designation.)
RCRA	Resource Conservation and Recovery Act
RDECOM	United States Army Research Development and Evaluation Command
RDT&E	Research, Development, Testing, and Evaluation
RDX	Cyclotrimethylenetrinitramine
RFMSS	Range Facility Management Support System

SUPCOM	20th Support Command
SW	Surface water pathway identified. (This refers to range grouping; M designation always precedes SW designation.)
TCPU	N,n'-bis (2,4,6-TCP)urea
TNT	Trinitrotoluene
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
USATHAMA	United States Army Toxic and Hazardous Materials Agency
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
WP	White Phosphorus
°F	Degrees Fahrenheit
µg/L	Micrograms per Liter