FINAL

SITE INSPECTION REPORT
FORT HAMILTON
BROOKLYN, NEW YORK

MILITARY MUNITIONS RESPONSE PROGRAM

November 2007

Prepared for:

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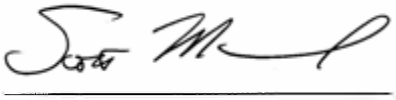
DoD Contract Number: W912DR-06-C-0028

Reviewed and Approved by:



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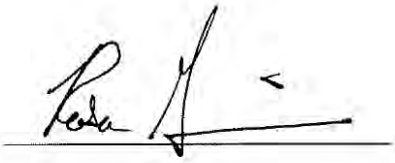

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

TABLE OF ACRONYMS

Acronym	Definition
AEC	Army Environmental Command
A/I	Active/inactive
AEDB-R	Army Environmental Database-Restoration
ARID	Army Range Inventory Database
Army	United States Army
ARS	Advance Range Survey
ASR	Archive Search Report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERL	Construction Engineering Research Laboratory
CFR	Code of Federal Regulations
CHE	CWM Hazard Evaluation
CSM	Conceptual Site Model
CTC	Cost to complete
CTT	Closed, transferring, and transferred
CWM	Chemical Warfare Material
DERP	Defense Environmental Restoration Program
DMM	Discarded military munitions
DoD	Department of Defense
DPW	Directorate of Public Works
EBS	Environmental baseline survey
EDR	Environmental Data Resources, Inc.
EHE	Explosive Hazard Evaluation
EOD	Explosive ordnance disposal
FUDS	Formerly Used Defense Sites
FY	Fiscal year
HE	High explosive
HHE	Health Hazard Evaluation
HRR	Historical Records Review
ICRMP	Integrated Cultural Resources Management Plan
IMCOM	Installation Management Command
IRP	Installation Restoration Program
ITRC	Interstate Technology & Regulatory Council
MACOM	Major Command (U.S. Army)
MC	Munitions constituents
MEC	Munitions and explosives of concern

Acronym	Definition
MMRP	Military Munitions Response Program
MRS	Munitions Response Site
MRSPP	Munitions Response Site Prioritization Protocol
NYAC	New York Area Command
NYDEC	New York State Department of Environmental Conservation
PA	Preliminary Assessment
PL	Public Law
RAC	Risk Assessment Code
RCRA	Resource Conservation and Recovery Act
RG	Record group
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendment and Reauthorization Act
SI	Site Inspection
TBTA	Triborough Bridge and Tunnel Authority
TPP	Technical Project Planning
U.S.	United States
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
UXO	Unexploded ordnance
VA	Veterans Administration
WWI	World War I
WWII	World War II

GLOSSARY OF TERMS

Closed Range – A military range that has been taken out of service as a range and that either has been put to new uses that are incompatible with range activities or is not considered by the military to be a potential range area. A closed range is still under the control of a Department of Defense (DoD) component.

Defense Site – All locations that currently are or formerly were owned by, leased to, or otherwise possessed or used by the DoD. The term does not include any operational range, operating storage or manufacturing facility, or facility that is used or was permitted for the treatment or disposal of military munitions.

Discarded Military Munitions (DMM) – Military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal. The term does not include unexploded explosive ordnance, military munitions that are being held for future use or planned disposal, or military munitions that have been properly disposed of consistent with applicable environmental laws and regulations.

Explosive Ordnance Disposal (EOD) – The detection, identification, on-site evaluation, rendering safe, recovery, and final disposal of unexploded ordnance, or explosive ordnance that has become hazardous by damage or deterioration, by a military response unit.

Explosives Safety – A condition where operational capability and readiness, personnel, property, and the environment are protected from unacceptable effects of an ammunition or explosives mishap.

Formerly Used Defense Site (FUDS) – A DoD program that focuses on compliance and cleanup efforts at sites that were formerly used by the DoD. A FUDS property is eligible for the Military Munitions Response Program if the release occurred prior to October 17, 1986; the property was transferred from DoD control prior to October 17, 1986; and the property or project meets other FUDS eligibility criteria.

Military Munitions – All ammunition products and components produced for or used by the armed forces for national defense and security, including ammunition products or components under the control of the DoD, the U.S. Coast Guard, the U.S. Department of Energy, and the National Guard. The term includes confined gaseous, liquid, and solid propellants, explosives, pyrotechnics, chemical and riot control agents, smokes and incendiaries, including bulk explosives and chemical warfare agents, chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and

dispensers, demolition charges, and devices and components of the above. The term does not include wholly inert items, improvised explosive devices, and nuclear weapons, nuclear devices, and nuclear components, other than non-nuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitation operations under the Atomic Energy Act of 1954 have been completed.

Munitions and Explosives of Concern (MEC) – This term, which distinguishes specific categories of military munitions that may pose unique explosives safety risks, means unexploded ordnance, DMM, or munitions constituents (e.g., Trinitrotoluene [TNT] or Cyclotrimethylenetrinitramine [RDX]) present in high enough concentrations to pose an explosive hazard.

Munitions Constituents (MC) – Any materials originating from unexploded ordnance, DMM, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

Munitions Debris – Inert items that do not contain explosive material, and therefore, do not qualify as MEC.

Munitions Response Site (MRS) – A discrete location requiring a munitions response as recommended in MMRP policy guidance and protocols.

Operational Range – A range that is under jurisdiction, custody, or control of the Secretary of Defense and that is used for range activities; or although not currently being used for range activities, that is still considered by the Secretary to be a range and has not been put to a new use that is incompatible with range activities. (10 U.S.C. 101(e)(3)(A) and (B)). Also includes “military range,” “active range,” and “inactive range” as those terms are defined in 40 CFR §266.201. (See reference (f)).

Other than Operational Range – Includes all property that is under jurisdiction, custody, or control of the Secretary of Defense that is not defined as an Operational Range Area.

Range – A designated land or water area set aside, managed, and used for range activities of the DoD. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, electronic scoring sites, buffer zones with restricted access and exclusionary areas, and airspace areas designated for military use in accordance with regulations and procedures prescribed by the Administrator of the Federal Aviation Administration.

Transferred Range – A range that is no longer under military control and had been owned, leased or otherwise possessed and used by the DoD, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that was used under

the terms of an executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager. Additionally, property that was previously used by the military as a range, but did not have a formal use agreement, also qualifies as a transferred range.

Transferring Range – A range that is proposed to be leased, transferred, or returned from the DoD to another entity, including federal entities. This includes a military range that was used under the terms of a withdrawal, executive order, special-use permit or authorization, right-of-way, public land order, or other instrument issued by the federal land manager or property owner. An active range will not be considered a transferring range until the transfer is imminent (generally defined as the transfer date is within 12 months and a receiving entity has been notified).

Unexploded Ordnance (UXO) – Military munitions that have been primed, fuzed, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded either by malfunction, design, or any other cause.

EXECUTIVE SUMMARY

Fort Hamilton is a 144-acre facility at the southernmost end of the Bay Ridge section of Brooklyn, NY situated at the far western end of Long Island. Since the War of 1812, this location has been essential to in the defense of New York City. Presently, Fort Hamilton is part of the Military District of Washington, a U.S. Army Major Command (MACOM), in addition to being part of the Installation Management Command (IMCOM).

This report presents the results of a Site Inspection (SI) under the Military Munitions Response Program (MMRP) at Fort Hamilton. Prior to the SI, the *CTT Range Inventory Report for Fort Hamilton* (Malcolm Pirnie, 2003) identified former military sites that required additional evaluation under MMRP. A total of five military response sites (MRSs) were identified in the inventory for Fort Hamilton totaling 2,845 acres as follows:

- Hamilton Closed Complex (FTHM-001-R-01) (42 acres)
- Hamilton Parade Ground #1 (FTHM-002-R-01) (15 acres)
- Hamilton Training Field (FTHM-003-R-01) (5 acres)
- Hamilton Transferred Complex (FTHM-004-R-01) (609 acres)
- Hamilton Transferred Complex- OW (FTHM-005-R-01) (2,174 acres)

A Historical Records Review (HRR) was completed for Fort Hamilton; the results of which are incorporated into this SI Report. The HRR research provided sufficient information needed to complete the SI evaluation at Fort Hamilton. The project information was reviewed and discussed by the Fort Hamilton Directorate of Public Works (DPW), USACE, AEC, and the New York Department of Environmental Conservation (NYDEC). All Stakeholders agreed that the research information at Fort Hamilton was sufficient to reasonably determine the absence of munitions and explosives of concern (MEC) and MC at the installation. Since no significant data gaps were identified, fieldwork activities were not conducted as part of this SI.

The research conducted during the HRR indicated that four of the five MRSs were ineligible for the MMRP because of strong evidence that training never occurred at these sites, and/or MEC and MC were never released. The only MMRP eligible MRS is the Hamilton Closed Complex (FTHM-001-R-01). The findings and recommendations of the SI are summarized in the Tables ES-1 and ES-2.

Table ES-1. MMRP Summary of SI Findings

MRS (AEDB-R Number)	Acreage CTT/SI	Basis for Acreage Changes	Primary MEC and MC	
			MEC	MC
Hamilton Closed Complex (FTHM-001-R-01)	42/8	Acreage is reduced to only include the batteries subarea.	None. MEC is unlikely.	None. MC is unlikely.
Hamilton Parade Ground #1 (FTHM-002-R-01)	15/0	Site ineligible for MMRP because training/live firing did not occur at the site.	None.	None.
Hamilton Training Field (FTHM-003-R-01)	5/0	Site ineligible for MMRP because training/live firing did not occur at the site.	None.	None.
Hamilton Transferred Complex (FTHM-004-R-01)	609/0	Site ineligible for MMRP because round fired from the batteries were inert.	None.	None.
Hamilton Transferred Complex-OW (FTHM-005-R-01)	2174/0	Site ineligible for MMRP because projectiles fired were inert.	None.	None.

Table ES-2. MMRP Summary of SI Recommendations

MRS (AEDB-R Number)	MRSPP Priority	Recommendations		Basis for Recommendations	
		MEC	MC	MEC	MC
Hamilton Closed Complex (FTHM-001-R-01)	No Known or Suspected Hazard	No Further Action	No Further Action	Artillery firing at former batteries was infrequent and limited to powder charges and inert projectiles, MEC is not suspected to be present.	Artillery firing at former batteries was infrequent and limited to powder charges and inert projectiles, MC is not suspected to be present.
Hamilton Training Field (FTHM-003-R-01)	NA	Ineligible for MMRP	Ineligible for MMRP	MEC not a concern, training/live firing did not occur at this site.	MC not a concern, training/live firing did not occur at this site.
Hamilton Transferred Complex (FTHM-004-R-01)	NA	Ineligible for MMRP	Ineligible for MMRP	MEC not a concern, training/live firing occurred at the site. Rounds fired from the batteries were inert.	MC not a concern, training/live firing occurred at the site. Rounds fired from the batteries were inert.
Hamilton Transferred Complex-OW (FTHM-005-R-01)	NA	Ineligible for MMRP	Ineligible for MMRP	MEC not a concern, training/live firing occurred at the site. Projectiles fired were inert.	MC not a concern, training/live firing occurred at the site. Projectiles fired were inert.

A summary of the SI findings for each site (both eligible and ineligible) addressed during the SI is presented below.

The **Hamilton Closed Complex** (FTHM-001-R-01) contains all closed ranges inside Fort Hamilton. It was composed of three distinct sites: the former batteries, a former parade ground, and a former training area. The batteries were used for defense and training purposes between 1860 and 1941. The HRR found substantial historical information regarding these areas and their use. Based on the reviewed data, artillery firing did occur at the Batteries site but the evidence indicates only infrequent activity limited to powder charges and inert projectiles.

MEC and MC are unlikely at two subareas (Parade Ground #2 and the Training Field) or other undesignated areas within the Hamilton Closed Complex. Firing activities did not occur in any of these areas, thus they are not eligible under the MMRP.

The potential exists for MEC and MC to be present at the batteries area since training that employed powder bags did occur in this area. However, historical research does not indicate improper disposal of powder bags occurred at Fort Hamilton. In addition, buried powder bags have never been discovered during redevelopment activities. In these areas, the ground has been significantly redeveloped to depths from 2 to 10 feet. Therefore, MEC or MC is not suspected at the site.

The MRS Priority Alternative Rating of "No Known or Suspected Hazard" was scored for the batteries portion of the Hamilton Closed Complex

Based on the type of training activities and subsequent site disturbance, a no further action recommendation is made for this site.

Hamilton Parade Ground #1 (FTHM-002-R-01) is a 15-acre area where maneuvers and potentially small arms training occurred. The munitions used inside this range would be small arms ammunition. It now lies under the Verrazano Bridge's supports and ramps. No documents were found to indicate any UXO investigations and/or responses were performed on the Hamilton Parade Ground #1.

Historical evidence indicates that this site was not used for training or live firing, and as a result, neither MEC nor MC is suspected to be present. The site is not eligible for further study under the MMRP.

Hamilton Training Field is a five-acre area that was used for maneuver exercises and to train soldiers with small arms. This is the same Training Field identified as part of the Hamilton Closed Complex, but it the portion that was transferred from U.S. Army control when the property was transferred to the Veteran's Hospital. Based on aerial photographs and

historical land use, it is concluded that Hamilton Training Field was not used for small arms training due to the proximity of this area to the barracks and officer's quarters.

Historical evidence indicates that this site was not used for training or live firing, and as a result, neither MEC nor MC is likely to be present. The site is not eligible under the MMRP.

Hamilton Transferred Complex (FTHM-004-R-01) is the land portion of the ranges emanating from the batteries at Fort Hamilton. Neither MEC nor MC is suspected in this area. The land area closest to the former batteries would have been too close to be fired on, and has been filled to accommodate Belt Parkway construction since the era when the large guns were used. The land area of Staten Island noted in the *CTT Range Inventory Report* was not fired upon, and will not contain MEC or MC from activities at Fort Hamilton. In addition, any indirect fire from the batteries would have been inert rounds, which do not qualify as MEC or MC. This site is not eligible for further study under the MMRP because it was never a target area and any indirect fire would have been from inert rounds.

Hamilton Transferred Complex-OW (FTHM-005-R-01) contains all battery firing fans located over the water associated with Fort Hamilton. The area is currently used for recreational and commercial shipping purposes. The range complex occupies 2,174 acres. The batteries were used for defense and training purposes between 1860 and 1941. Munitions used at the batteries were most likely shells filled with black powder and sized for their guns. The battery structures no longer exist. Any munitions fired from the batteries would be found inside the firing fans, which extend into the waters of New York Harbor. No documents were found to indicate any UXO investigations and/or responses were performed on the range complex areas. Historical records show only inert shells were fired from the batteries. Inert rounds do not qualify as MEC and MC, therefore, this site is not eligible for the MMRP.

1. INTRODUCTION

The Department of Defense (DoD) established the Military Munitions Response Program (MMRP) under the Defense Environmental Restoration Program (DERP) to address DoD sites with unexploded ordnance (UXO), discarded military munitions (DMM), and munitions constituents (MC) located on current and former military installations. Sites that are not eligible for the MMRP include: sites that had releases after September 30, 2002, properties classified as operational military ranges, permitted disposal facilities, and operating munitions storage facilities. The United States (U.S.) Army's inventory of closed, transferring, and transferred (CTT) military ranges and defense sites with UXO, DMM, or MC identified sites eligible for action under the MMRP.

This report presents the results of the MMRP Site Inspection (SI) conducted at Fort Hamilton, and includes the findings of the Historical Records Review (HRR). This SI was conducted in support of the U.S. Army Corps of Engineers (USACE) and the U.S. Army Environmental Command (AEC) under Contract W912DR-06-C-0028. Overall coordination of the SI and contract management was provided by the USACE Baltimore District. This SI is being conducted in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and will complete the Preliminary Assessment (PA)/SI requirement for the Munitions Response Sites (MRSs) at Fort Hamilton.

1.1. PURPOSE/SCOPE

The primary goal of the MMRP SI is to collect information necessary to make one or more of the following decisions:

1) Determine whether a Remedial Investigation/Feasibility Study (RI/FS) is required at the site;
2) Determine whether an immediate response is needed; or
3) Determine whether the site qualifies for no further action.

The secondary goals of the SI include collecting data to prepare better Cost to Complete (CTC) estimates and completing the Munitions Response Site Prioritization Protocol (MRSPP) for each MMRP site. In compliance with Title 32 of the Code of Federal Regulations (CFR) §179.5, the MRSPP score for the MRSs included in this SI is considered interim pending stakeholder input.

An HRR was completed for Fort Hamilton, and the results are incorporated into this SI Report. The HRR provided sufficient information needed to complete the MMRP evaluation at Fort Hamilton. This information was reviewed and discussed by the Fort Hamilton

Directorate of Public Works (DPW), USACE, AEC, and the New York Department of Environmental Conservation (NYDEC) at two Technical Project Planning (TPP) meetings conducted on January 9 and February 6, 2007. All Stakeholders agreed that the HRR information was sufficient to reasonably determine the presence or absence of munitions and explosives of concern (MEC) and MC at the installation. Since no significant data gaps were identified, fieldwork activities were not conducted as part of this SI. The discussions, decisions, and associated rationale are included in the TPP meeting minutes in Appendix D.

1.2. PROJECT DRIVERS

Federal, State, and local laws, as well as DoD and Army regulations and guidance provide the regulatory structure for managing MMRP sites at Fort Hamilton. The final structure of the MMRP is uncertain, as DoD and the U.S. Environmental Protection Agency are still resolving key issues at the national level. However, key legislative and administrative precedents will influence the final regulatory framework for the MMRP, and these items include:

Defense Environmental Restoration Program (DERP) Management Guidance (September 2001)

The DERP Management Guidance establishes a MMRP component for UXO, DMM, and MC defense sites. DERP dates back to the Superfund Amendment and Reauthorization Act (SARA) of 1986, and the scope of the DERP is defined in 10 U.S.C. §2701(b), which states that the:

> *Goals of the program shall include the following: … (1) The identification, investigation, research and development, and cleanup of contamination from hazardous substances, pollutants, and contaminants. (2) Correction of other environmental damage (such as detection and disposal of unexploded ordinance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment.*

National Defense Authorization Act (Fiscal Year [FY] 02) (Sections 311-312)

Sections 311-312 of the National Defense Authorization Act of FY02 tasked DoD to develop and maintain an inventory of defense sites that are known or suspected to have UXO, DMM, or MC. Section 311 required DoD to develop a protocol for prioritizing defense sites for response activities in consultation with the States and Tribes. Section 312 requires the DoD to create a separate program element to ensure that the DoD can identify and track munitions response funding.

Munitions Response Site Prioritization Protocol (MRSPP) (32 CFR Part 179)

The MRSPP was promulgated in October 2005, in compliance with Section 311 of the National Defense Authorization Act of FY02. This protocol provides the method by which DoD will assign a relative priority for munitions responses to each MRS in the inventory of defense sites known or suspected of containing MEC or MC.

The September 2001 Management Guidance for the DERP and the Defense Authorization Act FY02, described above, established the MMRP. The DERP and the MMRP provide guidance and methods for conducting a baseline inventory of defense sites containing, or potentially containing, UXO, DMM, or MC, and the MRSPP provides the method for DoD to assign a relative priority for subsequent munitions response. Data collected during the SI will be used to prepare the MRSPP for each MRS.

1.3. BACKGROUND

The Army completed an inventory of closed, transferring, and transferred ranges (CTT Range Inventory) in 2003. This Range Inventory was conducted in three phases. The first phase (Phase 1) involved a data call issued through the AEC requesting general information about ranges on various installations under each U.S. Army Major Command. The Phase 1 Inventory was conducted using a questionnaire named the Advance Range Survey (ARS). The ARS allowed the Army to meet the short-term data goal of supporting the DoD preparation of Senate Report 106-50.

The ARS for Fort Hamilton was completed in September 2000. Seven records for CTT ranges were found in the ARS: six were batteries and one was an indoor pistol range. (Indoor ranges are not MMRP eligible.) The Fort Hamilton ARS data were submitted to AEC and compiled into a master database of U.S. Army installations.

The ARS met the Army's initial needs; however, the long-term needs required a more detailed inventory that could not be obtained from information in the ARS. The follow-on inventory was divided into two phases. The Phase 2 Inventory addressed operational ranges (formerly referred to as active/inactive [A/I] ranges); whereas, the Phase 3 Inventory covered CTT ranges and sites with UXO, DMM, or MC. As a part of the operational range inventory effort, the data were electronically uploaded to the Army Range Inventory Database (ARID) maintained by AEC. Because there are no active ranges at Fort Hamilton, there was no A/I Inventory.

The CTT Range Inventory Report for Fort Hamilton was completed in December 2003. This report marked the end of the PA phase under CERCLA. A total of five CTT ranges were identified in the inventory for Fort Hamilton totaling 2,845 acres as follows:

- Hamilton Closed Complex (FTHM-001-R-01)
- Hamilton Parade Ground #1 (FTHM-002-R-01)
- Hamilton Training Field (FTHM-003-R-01)
- Hamilton Transferred Complex (FTHM-004-R-01)
- Hamilton Transferred Complex- OW (FTHM-005-R-01)

The research conducted during the HRR indicated that four of the five MRSs were ineligible for the MMRP because of strong evidence that training never occurred at these sites, and/ or MEC and MC were never released. The results of this investigation are discussed in this SI Report.

1.4. REPORT ORGANIZATION

This SI has the following sections:

- Section 1 – Introduction
- Section 2 – Summary of Preliminary Assessment (PA)
- Section 3 – Data Collection and Document Review Process
- Section 4 – Summary of Findings
- Section 5 – Conceptual Site Model (CSM)
- Section 6 – Munitions Response Site Prioritization Protocol (MRSPP) Results
- Section 7 – Summary and Conclusions

The following supporting information and analyses are included in the SI appendices:

- Archives Searched/Data Resources (Appendix A)
- Archive Documents (Appendix B)
- MRSPP Worksheets (Appendix C)
- TPP Meeting Minutes (Appendix D)

2. SUMMARY OF PRELIMINARY ASSESSMENT

2.1. INSTALLATION DESCRIPTION AND HISTORY

Fort Hamilton is located at the southernmost end of the Bay Ridge section of Brooklyn, NY. Within the City of New York, the fort is situated at the far western end of Long Island and on the eastern shore of the Narrows, directly across from Staten Island. Originally, together with the former Fort Wadsworth on Staten Island, Fort Hamilton constituted the historic defenses of New York Harbor. Fort Hamilton encompasses the area between Fort Hamilton Parkway and Dyker Beach Park. Although bounded by Fort Hamilton to the west, Fort Wadsworth was never part of this facility. Fort Hamilton is 176.9 acres, but with easements to accommodate public access to Shore Drive and the Verrazano Narrows Bridge and other security easements, the Fort Hamilton fence line encompasses approximately 120 acres (Figure 2-1).

The site is associated with important historical events of the New York region including: one of the first salvos in the American Revolution on July 4, 1776; the protection of New York Harbor from the British in the War of 1812 and from the Confederates in the Civil War; soldiers from the garrison helped to quell the New York City Draft Riots of July 1863; and during World Wars I and II, the fort served as a major embarkation and separation center. Today, it is the military's only installation in the New York metropolitan area and provides administrative, intelligence, operational, financial, managerial, legal, security, and logistical support for all assigned and attached units. The installation also provides administrative, logistical and medical support to retirees and their dependents; reserve centers and National Guard units; and active duty personnel (including tenant and satellite units) in New York City and the surrounding counties. The installation provides housing for military, key, and essential civilian personnel working on-post and in the New York City Metropolitan area.

Several forts were erected to protect New York Harbor during the early years of American nationhood. These forts included Fort Wadsworth (on Staten Island), Fort Lafayette (on a reef in the Narrows), and Fort Lewis (within the present-day Fort Hamilton). After the War of 1812, military planners decided to erect a masonry casemate fort and an earthen redoubt on the site of Fort Lewis. In 1814, the original property of 61 acres was acquired. Redesignated Fort Hamilton, the fort was constructed between 1825 and 1831 as part of what is called "the Third or Totten System" of coastal defense. An additional 95 acres were acquired, bringing the area to 156 acres. Several officers, who later became famous, served at the installation early in their careers, and included: Captain Robert E. Lee (from 1841-1846), Major Thomas "Stonewall" Jackson (in 1849), and Captain Abner Doubleday (during the late 1850s and in 1861). Major Richard Delafield, Chief U.S. Army Engineer and noted

Superintendent of the U.S. Military Academy, also served at the facility during his career (Integrated Cultural Resources Management Plan [*ICRMP*], DPW, 2005).

During the Civil War, the installation constructed temporary buildings and residences to the north and east of the casemate fort. At this time, it was used to train volunteer regiments and defend the Narrows as an access to New York Harbor. The fort was equipped for its defensive mission with batteries armed with cannons. At the turn of the twentieth century, Fort Hamilton increased its physical size by incorporating contiguous properties and its defenses were modernized in response to the recommendations of the Endicott and Taft Boards. At the same time, the surrounding Town of New Utrecht was first subsumed into the City of Brooklyn in 1896, and then into the City of New York two years later (*ICRMP*, DPW, 2005).

During the twentieth century, the area surrounding Fort Hamilton experienced intensive development as a residential community and as part of the urbanization of New York City. The construction of the Shore Parkway in the late 1930s cut the fort off from its historic relationship with the sea. In the late 1950s, the Army gave the Triborough Bridge and Tunnel Authority (TBTA) 37 acres to build the Verrazano-Narrows Bridge (completed in 1964); the TBTA gave Fort Hamilton 11 acres in return. Also, in the early 1960s, the State of New York donated 14 shoreline acres to Fort Hamilton.

In World War I (WWI) and World War II (WWII), Fort Hamilton operated as a training, embarkation, and separation center. Between the wars, it served as an infantry center. The fort underwent reorganization over time, assuming duties increasingly related to recruitment, housing, and general support, and less for coastal defense. The installation today is roughly two-thirds of its greatest extent during WWII, with grants to the Veterans Administration (VA) for a hospital in the northeast section, the TBTA for the approaches to the Verrazano Narrows Bridge in the west, and to the New York City Department of Transportation in the south for the Shore Parkway.

In the early 1970s, the command structure of the Army was reorganized, resulting in the creation of the New York Area Command (NYAC) in 1975. Although headquartered at Fort Hamilton, the installation was subordinate to Command of Fort Dix, New Jersey (Facility Engineers Office, 1991; Klein et al. 1986). Presently, Fort Hamilton is part of the Military District of Washington, a U.S. Army Major Command (MACOM), in addition to being part of the Installation Management Command (IMCOM). Contributing administrative, financial, intelligence, legal, logistical, managerial, operational, and security support for all assigned and attached units, Fort Hamilton also “provides administrative, logistical, and medical support to retirees and their dependents, reserve units, National Guard units, and active duty personnel, including tenant and satellite units, in New York City and the surrounding

counties" (USACE, 1998). The mission of the U.S. Army Garrison Fort Hamilton is "to provide premium base operations and area support for the Northeast region, exceptional quality of life services and community housing, and protocol and foreign liaison support for the Army, the Department of Defense, and the United Nations" (*ICRMP* as citing Military District of Washington, 2000).

2.2. PHASE 3 CTT RANGE INVENTORY

The *CTT Range Inventory Report* was completed for Fort Hamilton in December 2003 (Malcolm Pirnie, 2003). This report marked the completion of the PA phase of work under CERCLA. The purpose of the *CTT Range Inventory Report* for Fort Hamilton was to identify CTT ranges at Fort Hamilton. The specific requirements of this investigation included: mapping CTT ranges and sites with UXO, DMM, or MC; collecting and preparing the data for inclusion into the ARID; conducting an assessment of explosive safety risk using the Risk Assessment Code (RAC) on each CTT range or site; and determining which sites potentially qualify for the MMRP.

The *CTT Range Inventory Report* identified five CTT ranges totaling 2,845 acres, including areas outside the installation's boundaries. The ranges being evaluated in the SI and their associated acreage as determined in the *CTT Range Inventory Report* are identified in the following section.

2.3. MMRP SITE DESCRIPTIONS

Five MRSs were identified at Fort Hamilton during the December 2003 *CTT Range Inventory Report* (Figure 2-2). These are:

- Hamilton Closed Complex (42 acres)
- Hamilton Parade Ground #1 (15 acres)
- Hamilton Training Field (5 acres)
- Hamilton Transferred Complex (609 acres)
- Hamilton Transferred Complex-OW (2,174 acres)

The suffix OW designates a site that is all open water, and in this case is the water of the Narrows and Lower New York Harbor that lie to the south and west of Fort Hamilton.

As part of the *CTT Range Inventory Report*, an assessment of explosive safety risk was conducted for each of the five originally identified sites. The RAC process required the completion of a worksheet that consisted of a series of questions regarding each CTT range or site. Based on the results of the worksheet, a relative score (RAC score) was assigned for

each area. The RAC score is an estimate of the relative explosives safety risk, which was reported as a number from one (high explosives safety risk) to five (negligible explosives safety risk).

Table 2-1. CTT Range Inventory Report and Site Summary

Range/ Site Name	AEDB-R#	Classification	Total Area (Acres)	Munitions Type(s)	RAC Score
Hamilton Closed Complex	FTHM-001-R-01	Closed	42	Large caliber (37mm and larger) High explosives (HE) Small arms	5
Hamilton Parade Ground #1	FTHM-002-R-01	Transferred	15	Small arms	5
Hamilton Training Field	FTHM-003-R-01	Transferred	5	Small arms	5
Hamilton Transferred Complex	FTHM-004-R-01	Transferred	609	Large caliber (37mm and larger) High explosives (HE)	5
Hamilton Transferred Complex-OW	FTHM-005-R-01	Transferred	2,174	Large caliber (37mm and larger) High explosives (HE)	1

Abbreviation: AEDB-R = Army Environmental Database-Restoration

The site locations are illustrated on Figure 2-2, and the results of the CTT Range Inventory are summarized in Section 3.2.6. The information obtained and descriptions of these sites as summarized from the CTT Range Inventory are presented in the following paragraphs.

The following description of each of the above sites is taken verbatim from the C*TT Range Inventory Report.* The quoted text serves as the point of departure for the subsequent analysis provided in Section 4 of this document:

2.3.1. Hamilton Closed Complex (FTHM-001-R-01)

> This range complex contains all closed ranges inside Fort Hamilton. It includes eleven battery firing points, a parade ground, and a training field. The range complex occupies 42 acres. The batteries were used for defense and training purposes between 1860-1 941. Munitions used at the batteries were most likely shells filled with black powder and sized for its guns. The battery structures no longer exist. Any munitions fired from the batteries would be found inside the firing fan, which extends into the waters of New York Harbor. The parade ground and the training field were used for maneuvers and small arms training. The parade ground was used from 1900 to 1964. The training field was used from 1892 to 1950. Current uses on the property include installation housing, tennis courts, parking lots, baseball fields, and

undeveloped land. No documents were found to indicate any UXO investigations and/or responses were performed on the range complex areas. The Fort Hamilton batteries included in this range complex are: Brown, Burke, Doubleday, Gillmore, Griffin, Johnson, Livingston, Mendenhall, Neary, Piper, and Spear. There are eleven installation restoration program sites within the range boundaries, but none of them relate to munitions. FTHM-02, FTHM-03, FTHM-04, FTHM-24, and FTHM-26 are all designated response complete since all required cleanups have been completed. FTHM-05 and FTHM-20 did not qualify for DERA/BRAC [DERA=Defense Environmental Restoration Account; BRAC=Base Realignment and Closure Act] funding. FTHM-06, FTHM-12, and FTHM-25 are designated response complete because all studies were completed and no further cleanup is required. FTHM-19 is classified as response complete for unspecified reasons in the Army environmental database.

2.3.2. Hamilton Parade Ground #1 (FTHM-002-R-01)

This range is a 15-acre area where maneuvers and potentially small arms training occurred. This transferred range is located outside the northwestern corner of the Fort Hamilton installation boundary. The parade ground was used from 1900 to 1964. The munitions used inside this range would be small arms ammunition. It now lies under the Verrazano Bridge's supports and ramps. No documents were found to indicate any UXO investigations and/or responses were performed on the Hamilton Parade Ground #1.

2.3.3. Hamilton Training Field (FTHM-003-R-01)

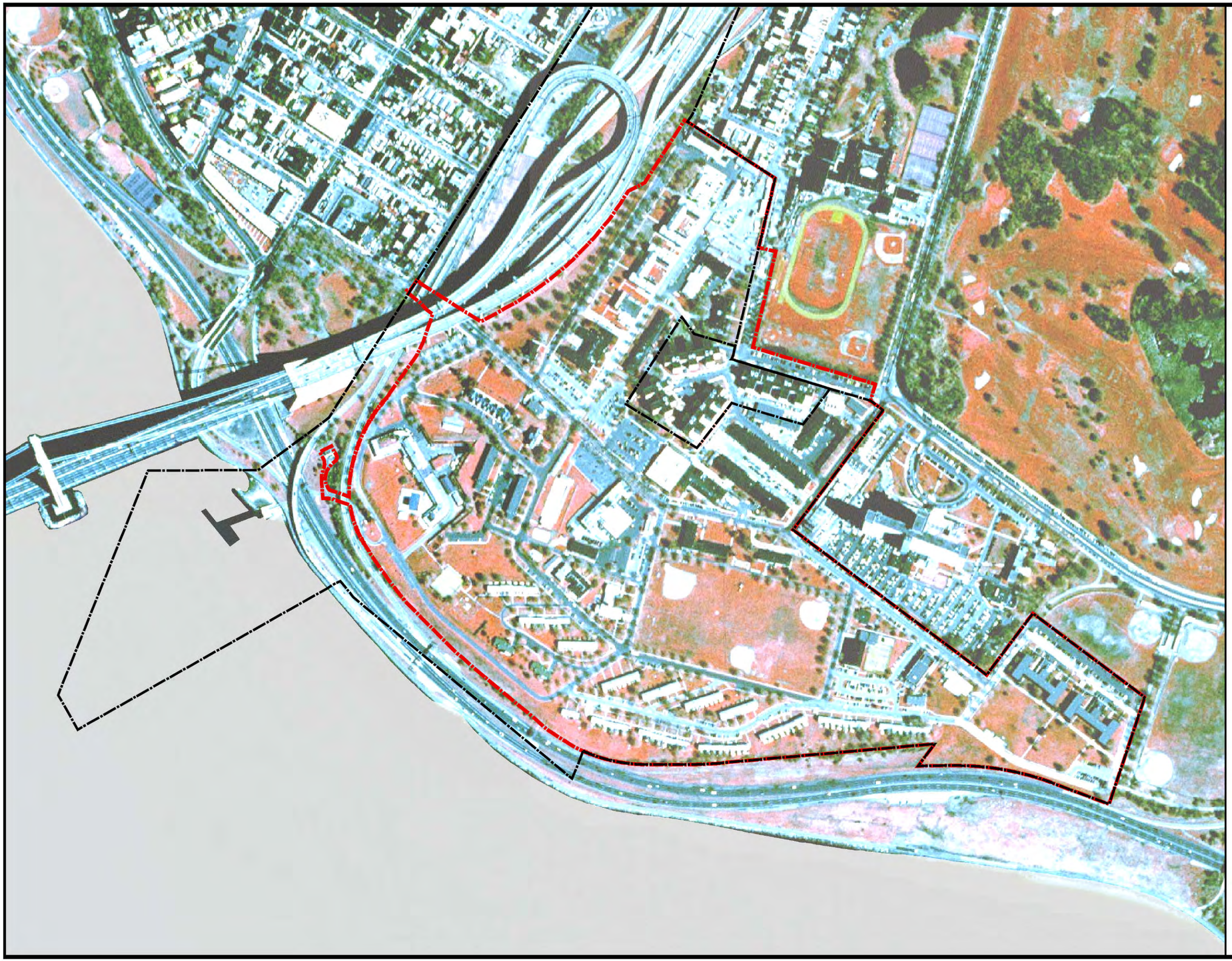
This range is a five-acre area that was used for maneuver exercises and to train soldiers with small arms. It could accommodate 500- yard firing, but due to its proximity to civilian housing, the firing range was reduced to 300 yards. This transferred range is located outside the northeastern corner of the Fort Hamilton installation boundary. The training field was used from 1892 to 1950. The munitions used were small arms ammunition. This portion of the training field (the closed part is under the Hamilton Closed Complex) is covered by the Veteran Administration's Hospital, which was constructed in the 1950s. No documents were found to indicate any UXO investigations and/or responses were performed on the Hamilton Training Field.

2.3.4. Hamilton Transferred Complex (FTHM-004-R-01)

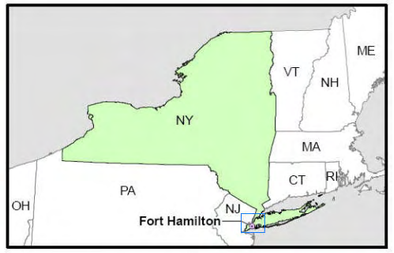
This range complex includes ten battery firing fans. The range complex occupies 609 acres. The batteries were used for defense and training purposes between 1860-1 941. Munitions used at the batteries were most likely shells filled with black powder and sized for their guns. The battery structures no longer exist. Any munitions fired from the batteries would be found inside the firing fans, which extend into the waters of New York Harbor. Current uses of this complex include sections of the Belt Parkway, a parking lot, and housing complexes. No documents were found to indicate any UXO investigations and/or responses were performed on the range complex areas. The Fort Hamilton battery firing fans covered under this range complex are: Burke, Doubleday, Gillmore, Griffin, Johnson, Livingston, Mendenhall, Neary, Piper, and Spear.

2.3.5. Hamilton Transferred-OW (FTHM-005-R-01)

This range complex contains all battery firing fans located over the water associated with Fort Hamilton. The range complex occupies 2,174 acres. The batteries were used for defense and training purposes between 1860-1 941. Munitions used at the batteries were most likely shells filled with black powder and sized for their guns. The battery structures no longer exist. Any munitions fired from the batteries would be found inside the firing fans, which extend into the waters of New York Harbor. No documents were found to indicate any UXO investigations and/or responses were performed on the range complex areas. The area is currently used for recreational and commercial shipping purposes.



URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878



Legend

- Government Property
- Installation Fenceline

N
W E
S

1:5,000

0 25 50 100 150 200 Meters

0 100 200 400 600 800 Feet

G:\15900215_MMRP\15298910_FtHamilton\MXD\
FtHamilton_Fig2-1.mxd
Date: 08/22/07
Created: JMW
Checked: RG
Senior: SM

Source Document:
CTT Range Inventory, 2003

Figure 2-1
Government Property and
Installation Fenceline
Fort Hamilton, NY

Hamilton Parade Ground #1
FTHM-002-R-01

Hamilton Closed Complex
FTHM-001-R-01

Hamilton Training Field
FTHM-003-R-01

Hamilton Transferred Complex
FTHM-004-R-01

Hamilton Transferred Complex
FTHM-005-R-01

Former Fort
Wadsworth

Hamilton Transferred - OW
FTHM-004-R-01

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

Legend

- CTT Site - Transferred
- CTT Site - Closed
- Installation Fenceline

N
W E
S

1:16,000

0 100 200 400 600 800 Meters

0 0.25 0.5 Miles

G:\15900215_MMRP\15298910_FtHamilton\MXD\
FtHamilton_Fig2-1.mxd
Date: 08/22/07
Created: JMW
Checked: RG
Senior: SM

Source Document:
CTT Range Inventory, 2003

Figure 2-2
CTT Range Inventory
Fort Hamilton, NY

3. DATA COLLECTION AND DOCUMENT REVIEW PROCESS

The first step of the SI was to perform the HRR. Five primary sources of information were researched as part of the data collection effort for the HRR. The types of data included:

1. National and regional archives record group (RG) search;
2. Installation site visits;
3. Review of existing Archives Search Reports (ASRs) and administrative records for adjacent Formerly Used Defense Sites (FUDS) associated with Fort Hamilton;
4. Interviews; and
5. Review of the *CTT Range Inventory Report* and backup data.

Relevant archival record repositories and RGs were selected based on guidance set forth in:

- *Technical/Regulatory Guideline for Munitions Response Historical Records Review*, prepared by the Interstate Technology & Regulatory Council (ITRC) Unexploded Ordnance Team (ITRC, 2003), and
- U.S. Army Corps of Engineers (USACE) guidance for performing Archives Search Reports as found at *http://www.mvs.usace.army.mil/engr/ed-p/asr.htm*.

3.1. DATA COLLECTION METHODS

3.1.1. National and Regional Archives

The search of national and local archival repositories produced useful information concerning the history of batteries and gun emplacements at Fort Hamilton. The findings and sources for archival research services provided by Heritage Research Center, Ltd. are presented in Appendix A. In addition, the retrieved resources are included as an Access database on the enclosed CD as Appendix B. These resources will be referenced using the code provided in that report, e.g., FHN000##.

The archival repositories and RGs that were searched are listed below.

- National Archives and Records Administration – College Park, MD

  Textual Branch

  - RG 51: Bureau of the Budget
  - RG 77: Office of the Chief Engineers
  - RG 92: Office of the Quartermaster General
  - RG 94: Records of the Adjutant General's Office, 1780s-1917
  - RG 107: Office of the Secretary of War

- RG 111: Office of the Chief Signal Officer
- RG 156: Office of the Chief of Ordnance
- RG 159: Office of the Inspector General
- RG 160: Headquarters Army Services Forces
- RG 165: War Department General and Special Staffs
- RG 175: Records of the Chemical Warfare Service
- RG 177: Chief of Arms
- RG 319: Army Staff
- RG 330: Records of the Department of Defense
- RG 334: Inter-Service Agencies
- RG 335: Office of the Secretary of Army
- RG 337: HQ, Army Ground Forces
- RG 338: U.S. Army Continental Commands, 1942–present
- RG 392: U.S. Army Coast Artillery District and Defenses, 1901-1942
- RG 393: U.S. Army Central Command, 1821-1920
- RG 407: Adjutant General's Office
- RG 429: Organizations in the Executive Office of the President
- RG 546: U.S. Continental Army Command

Cartographic Branch

- RG 77: Office of the Chief Engineers
- RG 92: Office of the Quartermaster General
- RG 94: Records of the Adjutant General's Office, 1780s-1917

Still Picture Branch

- RG 77: Office of the Chief Engineers
- RG 92: Office of the Quartermaster General
- RG 111: Office of the Chief Signal Officer
- RG 319: Army Staff
- RG 394: U.S. Army Continental Commands, 1920–1942

- National Archives and Records Administration – Northeast Region, New York City, NY
  - RG 77: Corps of Engineers
  - RG 269/270: Real Property Disposal Files
  - RG 338: U.S. Army Continental Commands, 1942–present
  - RG 392: U.S. Army Continental Commands, 1920–1942

- Military History Institute, Carlisle, PA

3.1.2. Web Search

In addition to the data sources listed above, research was conducted on the internet to supplement archival data and data obtained from the installation. The internet sources that were searched are based on Appendix B of the *Technical/Regulatory Guidelines for Munitions Response Historical Records Review* (ITRC, 2003). A complete list of all web sources is located in Appendix A.

Internet sources provided primarily general information about Fort Hamilton, and specific information rarely contained details regarding training or firing at the ranges or sites. Details from the internet search are provided in the MRS descriptions in Section 4.

3.1.3. Site Visits

Concurrent with the kick-off meeting, a site visit to Fort Hamilton was conducted by URS to review available data. The kick-off meeting/site tour was conducted on August 29, 2006 by Dr. Rosa Gwinn of URS, with representatives from USACE-Baltimore District and AEC. The site visit was conducted to review relevant installation materials to complete the HRR for the Fort Hamilton sites. While onsite, URS team members reviewed environmental reports, documents, and maps of Fort Hamilton at the DPW, Environmental Office and at the Fort Hamilton Harbor Defense Museum.

Dr. Gwinn was provided a tour of the museum on August 29, 2006. The museum is housed in the Carbonier, the rear land defense of the original fort. This structure of heavy stone walls and a sod roof is on the National Register of Historic Places. The museum exhibits contain numerous artifacts relevant to the firing and batteries at Fort Hamilton. Although most artifacts were not originally from this site, they are representative of armaments used at Fort Hamilton. In addition to cannons, shells, and cannon balls, the museum has some films that show the procedures used to fire stationary cannon and the later disappearing guns. None of the films were shot at Fort Hamilton.

Interviews with relevant personnel were conducted and records from previous interviews were thoroughly reviewed. Limited interviews were conducted in 1998 for the *Archive Search Report* (*ASR*; USACE, 1998).

3.2. ARCHIVAL/HISTORICAL AND OTHER RECORDS COLLECTED

The following subsections present the data collected from the sources outlined in Section 3.1. Although additional records may have been reviewed from the sources presented in the previous sections, the records listed in this section represent the data that were determined to be applicable to the HRR.

3.2.1. Documents/Reports

Table 3-1 lists documents that provided relevant information regarding former ranges and training areas within Fort Hamilton. Additional information regarding these documents is provided in Section 3.3.

Table 3-1. Summary of Documents and Relevant Information

Document Name	General History	General Installation Information	Munitions Use	MC
The Defenses of Sandy Hook, Thomas J. Hoffman, National Park Service, U.S. Department of the Interior, www.nps.gov/gate, undated internet publication	X		X	
Remedial Investigation Report for Denyse Wharf Sediments (Task 02-5), Fort Hamilton, Brooklyn, NY, TRC Environmental Corporation, July 1997				X
Ordnance and Explosives Archives Search Report, USACE-St. Louis District, September 1998	X	X	X	
Fort Hamilton Environmental Baseline Report, Parsons Harland Bartholomew and Associates, 1998	X	X		
Fort Hamilton, NY: Historic Landscape Inventory, by Adam Smith and Suzanne K. Loechl for CERL, September 2000	X	X	X	
Draft Environmental Baseline Survey of Army Property for the Residential Communities Initiative at Fort Hamilton, New York, USACE-Mobile District, 2002	X	X		
Closed Transferring and Transferred Range/Site Inventory Report, Fort Hamilton, NY, Malcolm Pirnie, December 2003	X	X	X	
Property Eligibility Report, Hamilton Training Field (FTHM-003-R-01), Fort Hamilton, NY, TechLaw, December 2004a	X	X	X	
Property Eligibility Report, Hamilton Transferred Complex (FTHM-004-R-01), Fort Hamilton, NY, TechLaw, December 2004b	X	X	X	
Property Eligibility Report, Hamilton Parade Ground #1 (FTHM-002-R-01), Fort Hamilton, NY, TechLaw, December 2004c	X	X	X	
Integrated Cultural Resources Management Plan (ICRMP) for Fort Hamilton, Brooklyn, Kings County, New York, Updated September 2005 by DPW	X	X	X	

Abbreviations: CERL=Construction Engineering Research Laboratory; DPW=Directorate of Public Works; USACE=U.S. Army Corps of Engineers

3.2.2. Archival Records

The Heritage Archives Search obtained numerous maps, letters, memoranda, and photographs regarding Fort Hamilton. These materials were scanned and are included in Appendix B. A limited number of artillery training records from the late 1800s and early 1900s were identified in the search.

From their archives, Fort Hamilton provided a portion of a document that addresses the batteries during the 1940s. That document is "Annex A, Amendment to *Harbor Defense Projects for Harbor Defenses included in the New York-Narragansett Bay Area, Parts I-V.*" The document is included in Appendix B.

In addition to the Heritage Archives Search, the *ASR* (USACE-St. Louis, 1998) contained a significant body of correspondence regarding the history of Fort Hamilton. A few items refer to range activity and training. Specific items are referenced by site in Section 4.

3.2.3. Maps/Drawings

Maps and drawings were obtained from Fort Hamilton, the National Archives, and the *ASR*. The maps are numerous and depict changes to the fort, batteries, and coastline over time. A complete listing of maps used is provided in Table 3-2.

Table 3-2. Summary of Maps and Drawings

Map Name, Date	Map ID *	General Installation Information	Map Coverage Includes Range Areas	Ranges of Concern Shown
Site Plan of Fort Hamilton, Brooklyn, New York, undated	ASR 371			
Sketch of Armament in old Fort Hamilton, September 10, 1864	ASR 351	X		
Sketch of Armament of the Redoubt at Fort Hamilton, September 10, 1864	ASR 353	X		
Hand drawn map submitted with General John Newton's letter, April 1, 1871	ASR 368	X	X	
Sketch of Fort Hamilton, New York Harbor, consisting of Fort Hamilton, old fort, Battery No. 1; New Battery and Mortar Battery, showing armament, April 1, 1892	ASR 393	X	X	X
Map of Reservation, Fort Hamilton, New York, 1899	FHN00152	X	X	
U. S. Government Land at Fort Hamilton, New York, compiled under the direction of Lt. Col. W. L. Marshall, Corps of Engineers, U. S. A., from previous maps and present data, 1905	ASR 378	X	X	
Fort Hamilton, New York, Proposed Locations of New Buildings, October 31, 1918	ASR 334	X	X	
Map of Fort Hamilton, revised April 17,1925	ASR 355	X	X	
U.S. Military Reservation, Fort Hamilton, New York, Filled Area at Easterly End of Reservation, August 9, 1927	ASR 395	X		
Undated, untitled map of Fort Hamilton that shows the Training Field behind Battery Livingston, estimated early 1930s	ASR 269	X	X	X
Map of Fort Hamilton, revised March 15, 1935	ASR 359	X	X	X
Fort Hamilton, New York, "Post and Boundary Map", July 13, 1942	ASR 380	X		

Map Name, Date	Map ID *	General Installation Information	Map Coverage Includes Range Areas	Ranges of Concern Shown
Fort Hamilton, showing air raid shelters, November 4, 1949	ASR 397	X		
Casemates Located at Fort Hamilton, April 23, 1950	ASR 399	X		
Post Map, September 24, 1953	ASR 336	X	X	
Master Plan for Redevelopment, Scheme K, Master Plan Superimposed on Existing Facilities, June 1, 1956	ASR 381	X		
Fort Hamilton, Basic Information, Reservation Boundary Map, June 1, 1956	ASR 383	X		
Fort Hamilton, Basic Information, Reservation Boundary Map, June 1, 1956	ASR 385	X		
Master Plan for Redevelopment, General Site Plan, January 9, 1958	ASR 387	X		
General Site Plan, Scheme K-2, February 19, 1959	ASR 342	X	X	
Electrical Gymnasium, Bldg. No. 402, Plan and Details, August 8, 1961	ASR 345	X		
Site Plan of Fort Hamilton, Brooklyn, New York, April 1962 (Harbor Defense Museum)	ASR 338	X		
Site Plan of Fort Hamilton, Brooklyn, New York, April 1962 (Public Works Office)	ASR 340	X		
Ammunition Bldg. No. 232, Plan, Elevations, Sections & Details, April 12, 1963	ASR 347	X		
Alignment and Location Plan, Area 1, October 8, 1963	ASR 349	X		
Real Estate, Fort Hamilton-New York (Military Reservation), August 27, 1964	ASR 376	X		
Basement Plan, Building 402, no date	ASR 366	X		
Master Plan, Basic Information Maps, General Site Plan, July 1, 1982	ASR 389	X		
Master Plan, Basic Information, General Site Map, August 31, 1988	ASR 391	X		

Map ID:
ASR # represents the page number of the map in the *ASR* as provided in Appendix B.
FHN00#### represents the TIFF in the Heritage Report as provided in Appendix A.

3.2.4. Photographs/Aerial Photographs

A search of the Cartographic and Aerial Photography branch of the National Archives and Records Administration in College Park, Maryland conducted by Heritage Research Center, Ltd. identified no historical photographs for Fort Hamilton. However, the *ASR* and *Historical Landscape Inventory* (Smith and Loechl, 2000) provided good coverage over time of the changes to Fort Hamilton. In addition, several oblique aerial photographs of the installation were provided to URS by Peter Koutroubis at the DPW.

URS contracted with a regulatory database company, *Environmental Data Resources, Inc. (EDR),* which provided aerial photographs from 1944, 1954, 1966, 1984, and 1995 (EDR, 2006). All aerial photographs are provided in Appendix B.

3.2.5. Interviews

Interviews with personnel were conducted during the site visit and by telephone. Interview information is impossible to recover from the WWI or WWII era as no surviving personnel are known to the Harbor Defense Museum staff. In an effort to capture older data, historians in the area of Coastal Defense were contacted, and these interviews were supplemented by online research.

The following interviews were conducted. Records from these interviews are included in Appendix B.

Mr. Peter Koutroubis, Environmental Engineer, Fort Hamilton Directorate of Public Works, Environmental Office – Mr. Koutroubis was interviewed by Rosa Gwinn during the site visit on August 29, 2006. He provided electronic copies of several historical oblique aerial photographs of the installation and several environmental reports.

Mr. Paul Morando, Director, Harbor Defense Museum – Mr. Morando was interviewed by Rosa Gwinn during the site visit on August 29, 2006. He has worked for the Harbor Defense Museum for 4 years. Mr. Morando had in-depth knowledge of site history and provided URS with information regarding historical maps and resources. Mr. Morando did not have specific information regarding the types or frequency of training at the installation. Maps from the Fort Hamilton Museum are provided in Appendix B.

Mr. Rich Cox, Curator, Harbor Defense Museum – Mr. Cox was interviewed by Rosa Gwinn, both in person during the site visit and in several subsequent telephone conversations. He has worked at the Museum for approximately 4 years. He shared useful map resources from the early WWII era that show the extent of coverage for the batteries at the time. He also referred to several photographs showing active firing post-WWI, presumably for training purposes. Mr. Cox was contacted in October 2006 by telephone. In these calls, he stated he was not aware of any firing ranges operating at the installation circa 1952.

Mr. Tom Hoffman, Park Historian, Sandy Hook, Gateway National Recreation Area – Mr. Hoffman was contacted on October 9, 2006 by Rosa Gwinn of URS to find information on training of personnel at Fort Hancock as an analogue for Fort Hamilton. Fort Hancock was more remote from the urban populations. Mr. Hoffman knows that practice for Fort Hancock artillerymen took place annually in May/June during the 1930s. The surrounding

area was lightly populated, and even less busy in these months, because the nearby towns were largely for beach tourists, who were attracted to the beach 'tourist houses' in the summer months. He is aware of notices to the local populations in advance of firing exercises, advising them to move china off of shelves and to open windows during practice times. This reduced damage claims for breakage due to the percussions from the large guns. Training involved a pyramidal target structure towed in the open water on a 300- to 400-yard cable. The objective was to hit near the fast-moving target without hitting it, which would have destroyed it for continued practice. Mr. Hoffman believes that the remoteness of Fort Hancock made it an attractive training location for troops from both Forts Wadsworth and Hamilton. He recalls hearing that those installations sent troops to train annually at Fort Hancock. Two 6-inch guns were moved from Battery Livingston (at Fort Hamilton) to replace identical guns that had worn out rifling from Fort Hancock's Battery Gunnison. This also supports less frequent use of the Fort Hamilton guns.

3.2.6. CTT Range Inventory Summary

The *CTT Range Inventory Report* was completed for Fort Hamilton in December 2003 (Malcolm Pirnie, 2003), marking the completion of the PA phase of work under CERCLA. The purpose of this Report for Fort Hamilton was to identify CTT ranges at Fort Hamilton. The specific requirements of this investigation were outlined in Section 2.2.

The five MRSs identified at Fort Hamilton in the December 2003 *CTT Range Inventory Report* are listed below. These sites are shown on Figure 2-1 and descriptions are provided in Section 2.3.

- Hamilton Closed Complex, FTHM-001-R-01 (42 acres)
- Hamilton Parade Ground #1, FTHM-002-R-01 (15 acres)
- Hamilton Training Field, FTHM-003-R-01 (5 acres)
- Hamilton Transferred Complex, FTHM-004-R-01 (609 acres)
- Hamilton Transferred Complex-OW, FTHM-005-R-01 (2,174 acres)

3.3. SUMMARY OF OTHER PREVIOUS INVESTIGATIONS

Several environmental studies have been performed at Fort Hamilton.

The review of data repositories for the HRR identified the following previous investigations, which contain information pertaining to munitions use and/or relevant environmental data at Fort Hamilton.

Ordnance and Explosives Archives Search Report, Fort Hamilton, NY (USACE-St. Louis, 1998)

The objective of the *Archive Search Report* (*ASR*, USACE, 1998) was to detail ordnance, ammunition, explosives, suspected chemical warfare material, and any other warfare material. This document is a comprehensive and exhaustive compilation of archival information for the historic military operations at Fort Hamilton. The *ASR* includes, as appendices, copies of the original source documents, such as maps, correspondence, and installation records (e.g., planning documents). These materials have proven helpful in determining the history of Fort Hamilton weaponry. The *ASR* is provided in two volumes: 1) Findings and 2) Conclusions and Recommendations.

Environmental Baseline Survey, Fort Hamilton, NY (Parsons, 1998)

This Environmental Baseline Survey (EBS) provides a broad overview of Fort Hamilton's environmental quality and identifies the extent to which environmental factors impact future development potential. Environmental factors assessed in the report include cultural resources; water quality; air quality; noise; topography, soils, and geology; vegetation and wildlife; solid waste; radon; wastewater pretreatment; pollution prevention; and hazardous materials and waste. Additionally, an environmental records search and review was conducted to help identify the potential effect of contaminated sites or hazardous waste management on future development.

Draft Environmental Baseline Survey of Army Property for the Residential Communities Initiative at Fort Hamilton, New York (USACE-Mobile District, 2002)

This EBS was prepared to specifically address conditions for three parcels of Fort Hamilton that are part of the private lease for the Army's Residential Community Initiative. The purpose of the EBS was to present a baseline condition of property to assess the health and safety risks; define the nature, magnitude, and extent of environmental contamination; and identify the potential environmental contamination liabilities associated with any real property transaction. Lead-based paint, asbestos, mold, potential polychlorinated biphenyl oil, and potential fuel oil were identified as issues in buildings under consideration.

Integrated Cultural Resources Management Plan, Fort Hamilton, NY (Panamerican, 1998 and updated by DPW, 2005)

The purpose of this ICRMP (DPW, 2005) is to ensure that cultural resource conservation measures and Army activities on Fort Hamilton are integrated and consistent with federal stewardship requirements. The ICRMP describes the programs and practices that will be implemented to conserve natural and cultural resources and comply with environmental laws and regulations at Fort Hamilton. The document contains general installation information and

a detailed history of military actions in the area. It includes a significant number of historical maps and figures and describes cultural areas of interest within the installation boundary.

4. HISTORICAL RECORDS REVIEW FINDINGS

Detailed descriptions of the sites based on the HRR findings are provided in the following subsections. In some cases, the conclusions from the *CTT Range Inventory Report* were inaccurate, and additional research from the HRR provides information that revises those previous findings.

4.1. HAMILTON CLOSED COMPLEX (FTHM-001-R-01)

The Hamilton Closed Complex was identified in the *CTT Range Inventory Report* as a 42-acre area comprising the portion of the current installation that was formerly used in support of training at Fort Hamilton. It includes former batteries, part of a former parade ground, and part of a former training field (Figure 4-1). Each of these components to the Hamilton Closed Complex is described separately below; the discussion presents refinements to information presented in the *CTT Range Inventory Report*. The histories of the three portions of the Hamilton Closed Complex are substantially revised from the previous inventory.

4.1.1. Batteries

Substantial historical data exist regarding the batteries at Fort Hamilton. The need for permanent guns at the Narrows was realized because of U.S. hostilities with the British in the War of 1812. In 1824, as part of the so-called Third System of coastal defense, a fortification was built at the current Fort Hamilton. This fortification, although modified, still exists. Table 4-1 presents a chronology of the guns at batteries at Fort Hamilton. The source of most of the information for this table is the *ASR* (USACE, 1998), which relied on historical maps. URS performed its own review of these maps, additional maps provided in the *ICRMP* (DPW, 2005) and the landscape inventory (Smith and Loechl, 2000), and historic correspondence for the chronology presented in Table 4-1. Therefore, the number and location of the battery guns are considered to be reliable information. To illustrate the locations of the features described in the battery timeline, Figures 4-2 and 4-3 show the gun placements in 1892 (ASR 393) and 1935 (ASR 359), respectively.

The guns at these emplacements/batteries had a considerable range, well beyond the shoreline at Fort Hamilton. Any projectiles fired from the batteries would be found inside the firing fan which extended into the waters of New York Harbor (see Section 4.1.5). Firing would not have resulted in munitions landing along the shoreline; typically the range of these guns is in the thousands of yards up to several miles. The *CTT Range Inventory Report* stated that the shoreline complex includes the batteries Brown, Burke, Doubleday, Gillmore, Griffin, Johnson, Livingston, Mendenhall, Neary, Piper, and Spear, as illustrated on Figure 4-2.

Table 4-1. History of Guns at Fort Hamilton

Era/Battery Name	Number of Guns	Gun Type (Years)
Third System 1835 (a)		
Fortress (pre batteries)	14	32-pounders
	40	cannonades
Barbette (mounted on roof)	26	42-pounders
	22	32-pounders
	8	mortars
1892 (b)		
Old Fort	6	24-pounders 'F.D. howitzers'
	3	10-inch siege mortars
	2	8-inch siege mortars
"New Battery" located south of Battery No. 1	26	15-inch Rodman guns
	1	20-inch Rodman gun
	1	10-inch sea coast mortar
Battery No. 1 (between old fort and waterline)	0	No guns in place
Early 1900s (Endicott Taft Board) to WWII (c)		
Burke	2	6-inch pedestal mount (1903-1917)
Johnson	2	6-inch pedestal mount (1902-1943)
Griffin	2	4.7-inch British Armstrong (1899-1913)
	2	3-inch masking pedestal mount (1902-1920)
	2	3-inch pedestal mount (1903-1946)
Livingston	2	6-inch disappearing carriage (1905-1948)
Mendenhall	4	6-inch disappearing carriage (1905-1917)
Piper	8	12-inch mortar carriage (1901-1942)
Doubleday	2	12-inch disappearing carriage (1900-1943)
Brown	2	12-inch disappearing carriage (1902)
Neary	2	12-inch barbette carriage (1900-1937)
Gillmore	4	10-inch disappearing carriage (1899-1942)
Spear	3	10-inch disappearing carriage (1898-1917)

Notes:
(a) As reported in the *ASR* (1998) with details from the 1835 site map.
(b) As reported in the *ASR* (1998) with details from the 1892 site map.
(c) Periods of emplacement as noted in final column. As reported in Smith and Loechl (2000), and adapted from Mark A. Berhow, *Modern American Seacoast Defenses: A List of Military Reservations and Concrete Gun Batteries, 1890-1950* (Mark A. Berhow, 2000).

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Legend

- Site Component
- CTT Boundary
- CTT Site - Closed
- Installation Fenceline

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0 50 100 200 300 Meters

0 300 600 1,200 Feet

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FtHamilton_Fig4-01.mxd
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Checked: RG
Senior: SM

Source Documents:
EDR, 2006 and
ASR 269, 1998

Figure 4-1
CTT Boundary for
Hamilton Closed Complex
Fort Hamilton, NY

P:\Gaithersburg\U000000572 USACE\MMRP SI\Fort Hamilton NY\Final HRR\Final Graphics\Ft Hamilton 1892.cdr (12/07/06) SS

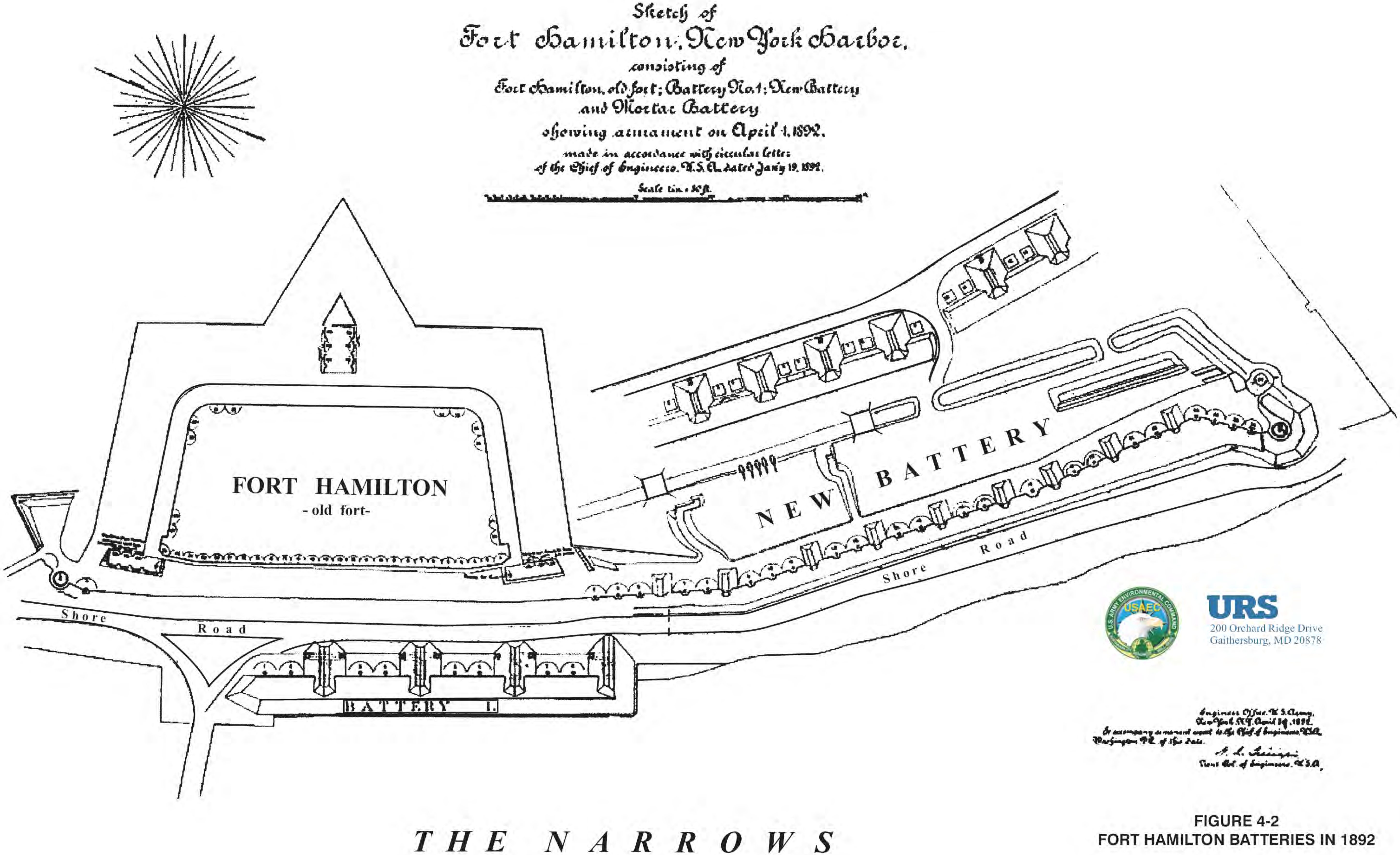

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FIGURE 4-2
FORT HAMILTON BATTERIES IN 1892

Source Document: ASR 393, 1998

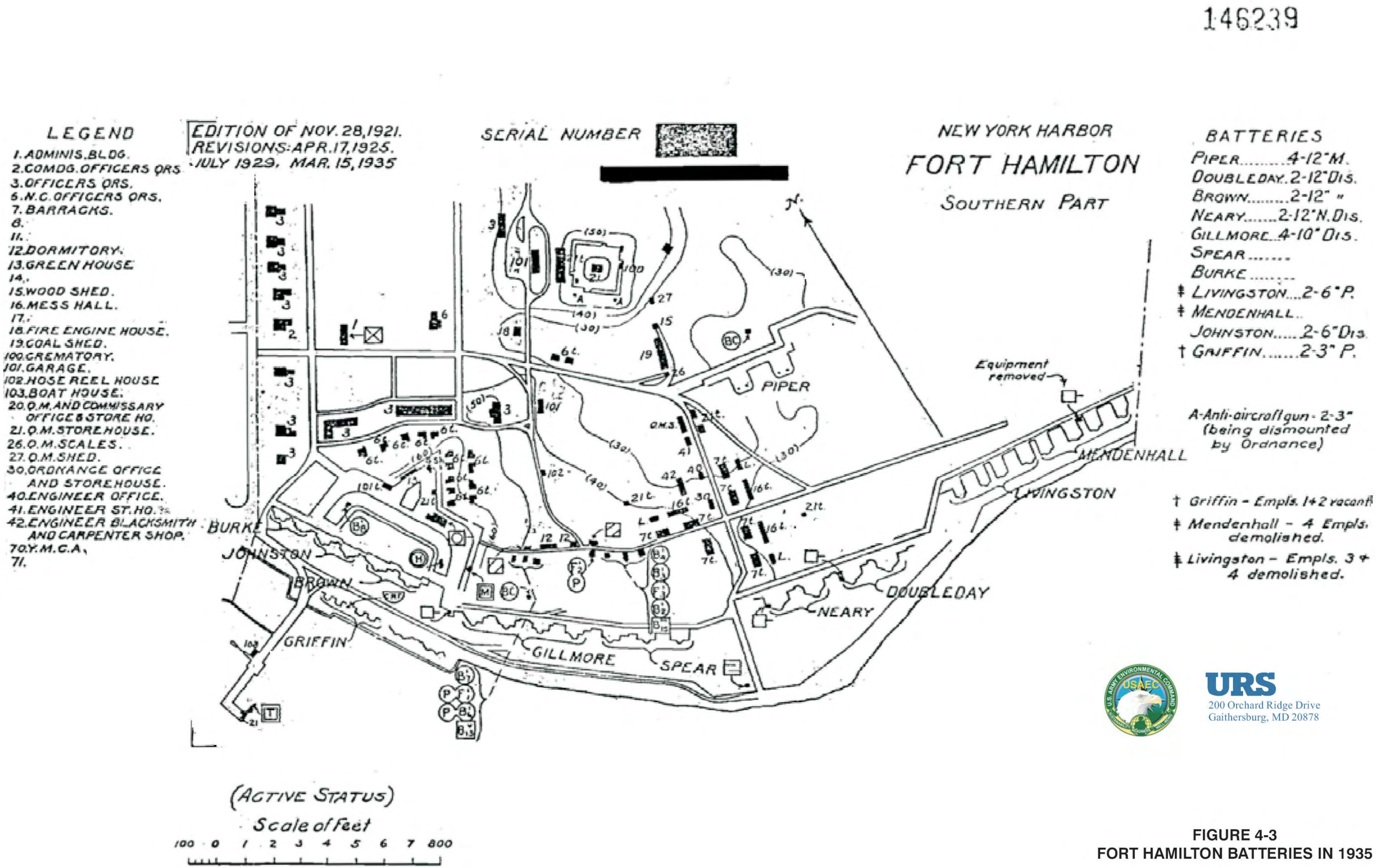

FIGURE 4-3
FORT HAMILTON BATTERIES IN 1935

Source Document: ASR 359, 1998

The HRR identified data regarding firing from these batteries, including a limited number of training records. Observations from these training records include:

- The projectile used was cast iron ball; bursting or explosive charges were never noted in the training records.
- Always fewer than 20 and generally fewer than 10 shots were made during practice.
- Water targets were in place as stationary targets prior to 1903 and slow-moving targets after that date.

These observations are based on training records from the *ASR* and from the Heritage Archives Search (Appendix B) and will be expanded on in the discussion of the Hamilton Transferred Complex-OW MRS in Section 4.5 below.

One area of interest that is associated with the batteries but not included in the *CTT Range Inventory Report* was the Redoubt. The Redoubt is a rear-defense structure developed as part of the early fort (the square feature in the top-center of Figure 4-2). The Redoubt served as a landward defense when the fort was first built in the 1820s. It had eight 24-pounder cannons around the top of the structure, according to a map dated 10 September 1864 (ASR 353). By WWII, nearly all of the large seacoast guns were removed at Fort Hamilton and replaced with anti-aircraft artillery: both 3-inch and .50-caliber. Most of the Redoubt's original guns were replaced by 1929 and dismounted in the early 1930s. Anti-aircraft guns were placed at the Redoubt during WWII. The Redoubt location was not included in the *CTT Range Inventory Report* as part of the Hamilton Closed Complex, presumably because not only was firing/training from this location extremely unlikely (and never recorded), but also because the location was completely regraded and modified by the Fort Hamilton Manor apartment construction in the 1950s (*ASR*, 1998). Although weapons were placed at the Redoubt for coastal defense, they were not used for training, they were not fired in the course of action, and the area has been significantly altered. Consequently, this area is not added to the Fort Hamilton Closed Complex.

Practice firing at the shoreline batteries involved the loading of powder charges and inert projectiles (ASR, 1998). The potential for MEC and MC at the batteries would be limited to discarded or buried powder charges since only inert rounds were used for training. The potential for buried powder charges to exist at the former batteries is considered unlikely, however, as MEC has never been encountered during redevelopment activities. The shoreline battery infrastructure was completely removed in 1966. According to the ICRMP, test sampling and historical records show that construction activities substantially altered the surface soil near the former batteries (DPW, 2005). These areas were either filled-in or disturbed to a minimum depth of 1.7 feet (DPW, 2005). There have been no reported finds of MEC during any construction activities at Fort Hamilton.

The *ASR* stated that the location of Battery Piper (a mortar battery set back from the shoreline batteries) was a "bore range" according to a 1941 "Annual Report of Construction and Repair" (*ASR*, page 267). An aerial photograph from 1942 (see Installation Resources section of Appendix B) show the mortar batteries as topographic indentations, one side of which may have made a convenient backstop. However, the distance across a single battery is no greater than about 50 feet, limiting its usefulness for any rifle training. Small arms firing may have been possible here, yet Fort Hamilton maps from the 1940s place barracks immediately adjacent to this site. No other data supporting the use of this location for a range could be found. At present, the location of the mortar batteries (Battery Piper) is used for military housing. These housing units were recently constructed, and no reports of munitions were made during construction or utility installation. Based on records review, there appears to be a low likelihood that a small arms range existed at the former Battery Piper.

Based on historic firing records, aerial photographs, interviews, and subsequent analysis, it is unlikely that the Batteries site contains MEC and MC. All documentation discovered indicates that artillery firing was infrequent and limited to powder charges and inert projectiles. No evidence of improper powder charge disposal was discovered for this site. In addition, it is unlikely that MEC and MC, if present, would remain given the amount of soil disturbance and fill material at the site. These conclusions are considered of high quality with little uncertainty.

4.1.2. Parade Ground #2

The *CTT Range Inventory Report* identifies the site of a former parade ground (Parade Ground #2) as an area potentially used for small arms training from 1900 to 1964 (Figure 4-1). The *CTT Range Inventory Report* indicates that this field was located between Battery Doubleday and Battery Piper, which are noted in Figure 4-3. However, maps reviewed for the HRR and for the *ASR* do not show Parade Ground #2 in use from 1900 to 1964. In order to understand the period of use of the area identified in the *CTT Range Inventory Report*, aerial photographs from 1944, 1954, and 1966 are presented as Figures 4-4 through 4-6.

In a 1944 photograph, the area between Batteries Neary/Doubleday and Battery Piper that was noted as "Parade Ground #2" in the *CTT Range Inventory Report* is covered with temporary structures. None of the 1944 or earlier maps or photographs reviewed shows a parade ground at this location.

In a 1954 aerial photograph, there are several changes to Fort Hamilton, most notably that all the former batteries have been removed (Figure 4-5). However, at this time Parade Ground #2 is still not apparent.

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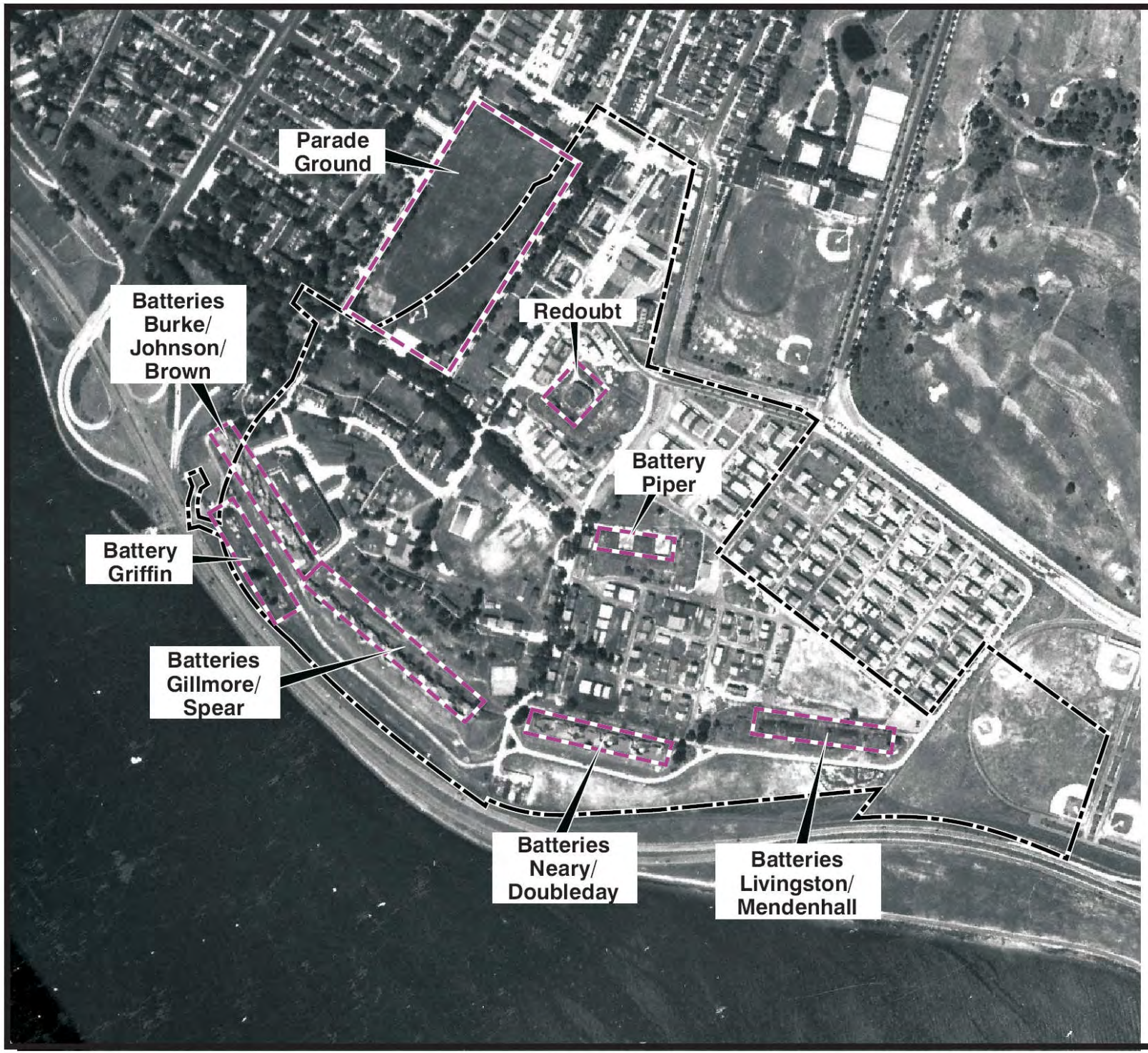

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200 Orchard Ridge Drive
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LEGEND:
Historic Feature
Installation Fenceline

FIGURE 4-4
1944 AERIAL PHOTOGRAPH
FORT HAMILTON, NY

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LEGEND:
Historic Feature
Installation Fenceline

SourceDocument: EDR, 2006

FIGURE 4-5
1954 AERIAL PHOTOGRAPH
FORT HAMILTON, NY

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0 560 Feet
SCALE

LEGEND:
Historic Feature
Installation Fenceline

FIGURE 4-6
1966 AERIAL PHOTOGRAPH
FORT HAMILTON, NY

In a 1966 photograph, the area noted as Parade Ground #2 in the *CTT Range Inventory Report* finally appears as an open area suitable to that use (Figure 4-6). This area has the faint outline of ball fields in the image, suggesting that its primary use was recreational.

In none of the reviewed aerial photographs were range structures apparent in the area occupied by Parade Ground #2.

Based on aerial photographs and historical land use, it is concluded that Parade Ground #2 was not used for small arms training due to the proximity of this area to the barracks and officer's quarters. In addition, historical documentation indicates this area was used for Close Order Drill (ASR, 1998). Consequently, neither MEC nor MC is suspected to be present at Parade Ground #2 and the site is not eligible for further investigation under the MMRP. This information and subsequent analysis is believed to be of high quality with little uncertainty.

4.1.3. Training Field

The third site of the Hamilton Closed Complex identified in the *CTT Range Inventory Report* was the Training Field (Figure 4-1). According to that document, a portion of the Training Field footprint remains within the installation boundary, and a portion has been transferred to the VA Hospital. The transferred portion of the Hamilton Training Field is discussed in Section 4.3. The remaining portion of the former Training Field was included in the closed portion of the Hamilton Closed Complex, which is discussed here.

The location of the Training Field identified in the *CTT Range Inventory Report* was identical to the footprint shown in the *ASR*. The *ASR* based its depiction on a single undated map (ASR 269). URS georeferenced the training field location from that map and transferring its location relative to the current installation map on Figure 4-7. Because the undated map shows Shore Road under construction, it likely dates from the 1930s (probably near 1935) in conformance with the date for Shore Road (presently Shore Parkway) construction reported in the *ICRMP* (DPW, 2005). In the undated map, the Training Field is behind and to the north of Batteries Livingston and Mendenhall, and more rectangular than interpreted in earlier work.

A November 28, 1921, map of Fort Hamilton (ASR 355) depicts the area behind Batteries Livingston and Mendenhall as the location of the "K. of C." and YMCA with an elongated rectangle about 500-feet long and 150-feet wide. These are presumably buildings for the Knights of Columbus and YMCA. There are faint X's marked through this rectangular feature, suggesting that they were not constructed, or were slated for removal. A 1935 revision of this same installation map (ASR 359) does not show these buildings, and there are signs that they were erased from the map. In addition, the Training Area does not appear on an August 9, 1927, map of the eastern side of Fort Hamilton (ASR 395). The only feature on this map in the area of interest is two buildings at the north end of the area labeled "Secondary Stations (Fort

Wadsworth)," which are connected to the Batteries Neary and Livingston via ducts with manholes. These stations are referenced in a 1904 letter as the Secondary Stations for range finding at Fort Wadsworth (FHN00029). That letter was a request for funds for construction of the station, which included dormitories, and for a generating plant to support the stations and Batteries Livingston and Mendenhall.

A 1936 oblique aerial photograph shows a large open field in this area (Appendix B). There are no vehicle tracks or structures (such as firing points) apparent in the field, and it does appear vegetated. At the northeast corner of the general area is a cluster of buildings that appear to be in the same location as those illustrated on the 1927 map. Neither the Training Area nor the "Secondary Stations" are shown on a 1935 map of Fort Hamilton. Consequently, it is likely that the Training Area use was limited from 1927 to 1935.

According to the *ASR* findings, this Training Area is believed to be the subject of a 1928 inspection memorandum, "Annual Inspection and Survey of Headquarters First Division and Fort Hamilton, New York" (ASR 298). This memorandum states that Fort Hamilton has *"open and level ground available for training purposes. This area is sufficient for close order drill and ceremonies, but does not permit essential tactical training."* The *ASR* concluded that the Training Area did not constitute a safe place for firing and cannot be considered a range based on these historical data. In addition, the absence of demarcated firing points, butts, or other range structures in contemporary photographs suggests it was not used for firing.

The footprint of the former Training Area in Hamilton Closed Complex is now the location of a fitness center, theater, and library. Most of the site is in the Hamilton Transferred Complex (Section 4.3). Hence, the Training Area did not operate as an area of live firing.

Based on aerial photographs and historical land use, it is concluded that the Training Field was not used for small arms training due to the close proximity of this area to installation structures and throughways. In addition, historical documentation indicates this area was not considered suitable for tactical training. Consequently, neither MEC nor MC is suspected to be present at the Training Field and the site is not eligible for further investigation under the MMRP. This information and subsequent analysis is believed to be of high quality with little uncertainty.

4.1.4. Summary for Hamilton Closed Complex

The Hamilton Closed Complex identified in the *CTT Range Inventory Report* was composed of three distinct sites: the former batteries, a former parade ground, and a former training area. The HRR found substantial historical information regarding these areas and their use. Based on the reviewed data, artillery firing did occur at the Batteries site but the evidence indicates only infrequent activity limited to powder charges and inert projectiles. The potential for MEC and

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Legend

- Training Field From 1930s Map
- CTT Boundary
- CTT Site - Closed
- Installation Fence

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0 20 40 80 120 160 Meters

0 300 600 Feet

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FtHamilton_Fig4-06.mxd
Date: 08/23/07
Created: JMW
Checked: RG
Senior: SM

Source Documents:
EDR, 2006 and
ASR 269, 1998

Figure 4-7
Training Field from 1930s Map
Fort Hamilton, NY

MC at the batteries would be limited to discarded or buried powder charges, however, this is considered unlikely, as MEC has never been encountered during redevelopment activities. At the other two sites, Parade Ground #2 and the Training Field, training activities involving firing of weapons never occurred based on historical evidence and, therefore, neither MEC nor MC is suspected to be present. Since training did not occur at these two sites, they are considered ineligible for further investigation under the MMRP. These conclusions are based on highly reliable contemporary maps, photographs, and memoranda.

4.2. HAMILTON PARADE GROUND #1 (FTHM-002-R-01)

The former Hamilton Parade Ground #1 identified in the *CTT Range Inventory Report* is 15 acres of transferred property outside the northwestern corner of the Fort Hamilton installation boundary (Figure 4-8). According to the available maps, the parade ground was part of Fort Hamilton as early as 1899, where it is shown surrounded by Officer's Quarters on the west and south, and barracks on the north. An 1892 map does not cover this portion of the installation, and an 1871 map labels the location as "Low Ground, Swampy." Consequently, the period of use as a parade ground began around 1899.

Use as a parade ground ended when the property was transferred in the late 20th century; the metamorphosis of the site is depicted in Figure 4-9. A 1944 aerial photograph shows the parade ground as an open field surrounded by residential quarters. Ball fields are visible on the property.

This property was transferred to the TBTA in the late 1950s and developed as an approach ramp to the Verrazano-Narrows Bridge in the 1960s. The ramp construction was completed in 1964 (USACE, 1998). The completed ramp can be seen on the 1966 aerial photograph (Figure 4-9).

According to the *CTT Range Inventory Report*, potential munitions used at the former Hamilton Parade Ground were small arms ammunition. Because of the presence of residential areas around Parade Ground #1 from inception, live firing of weapons at this location likely did not occur, but it is likely the site was used primarily for close order drills or ceremonial parades. As concluded for Parade Ground #2, this site did not constitute a safe place for live firing and is not considered a range. This is supported by the absence of range structures on aerial photographs. Thus, since the site was never used as a range, there is no potential for MEC or MC. This conclusion is also applicable to the corner of Parade Ground #1 that was not part of the transferred property.

According to the *ICRMP* (DPW, 2005), the area surrounding the Verrazano-Narrows Bridge ramp has been disturbed a minimum of 2 feet. The construction activities likely disturbed all of the soil throughout the area and any conditions from when this was used as a parade ground have been obliterated. There were no reported MEC finds linked to the bridge construction.

Based on aerial photographs and historical land use maps, it is concluded that Hamilton Parade Ground #1 was not used for small arms training due to the proximity of this area to the barracks and officer's quarters. In addition, this area was highly disturbed during the construction of the Verrazano-Narrows Bridge. No MEC finds were reported during this construction project. Based on the information presented here, neither MEC nor MC is suspected to be present at Parade Ground #1 and the site is not eligible for further investigation under the MMRP. This information and subsequent analysis is believed to be of high quality with little uncertainty.

4.3. HAMILTON TRAINING FIELD (FTHM-003-R-01)

A portion of the former Hamilton Training Field site identified in the *CTT Range Inventory Report* covers 5 acres of transferred property. It is located outside the northeastern corner of the Fort Hamilton installation boundary at the present location of the VA Hospital (Figure 4-10).

As described in Section 4.1.3, based on contemporary historical records, the Hamilton Training Field is believed to have been used for non-live fire training, such as close order drill after WWI. According to the *ASR* (USACE, 1998) the training area was used for close order drill, as referenced in a 1928 inspection memorandum, and was insufficient for any kind of tactical training.

The *CTT Range Inventory Report* stated that period of use for the Hamilton Training Field was from 1892 to 1950. Section 4.1.3 established that the area was open for training only between WWI and WWII. The *CTT Range Inventory Report* also stated that the training area could accommodate 600-yard firing, but due to the proximity to civilian housing, the firing range was reduced to 300-yards. This last reference is to correspondence regarding Fort Hamilton from the 1880s, when the installation boundary did not extend to the location of the Hamilton Training Field. The significance of this memorandum is addressed in greater detail in Section 4.6.

As determined in the discussion for the Hamilton Training Field in Section 4.1.3, the area was not used for firing, but was used for close order drill. Contemporary maps and aerial photographs did not provide evidence of firing points, targets, or berms. Subsequent site activities have disturbed that area to a minimum of 2 feet. There were no reported MEC finds linked to site development activities.

Based on aerial photographs and historical land use, it is concluded that Hamilton Training Field was not used for small arms training due to the proximity of this area to the barracks and officer's quarters. In addition, historical documentation indicates this area was used for close order drill (*ASR*, 1998). Consequently, neither MEC nor MC is suspected to be present at Hamilton Training Field and the site is not eligible for further investigation under the MMRP. This information and subsequent analysis is believed to be of high quality with little uncertainty.

URS
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Legend

- CTT Boundary
- CTT Site - Transferred
- Installation Fenceline

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0 50 100 200 300 Meters

0 300 600 1,200 Feet

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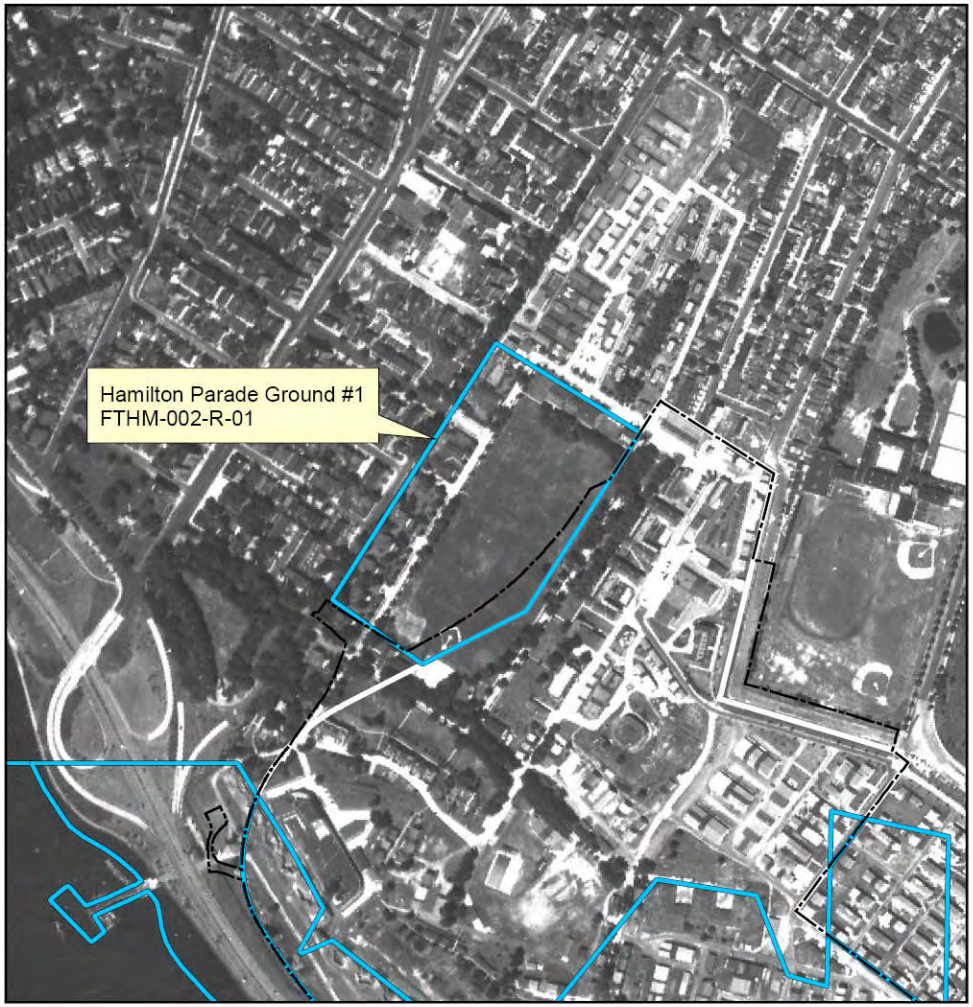
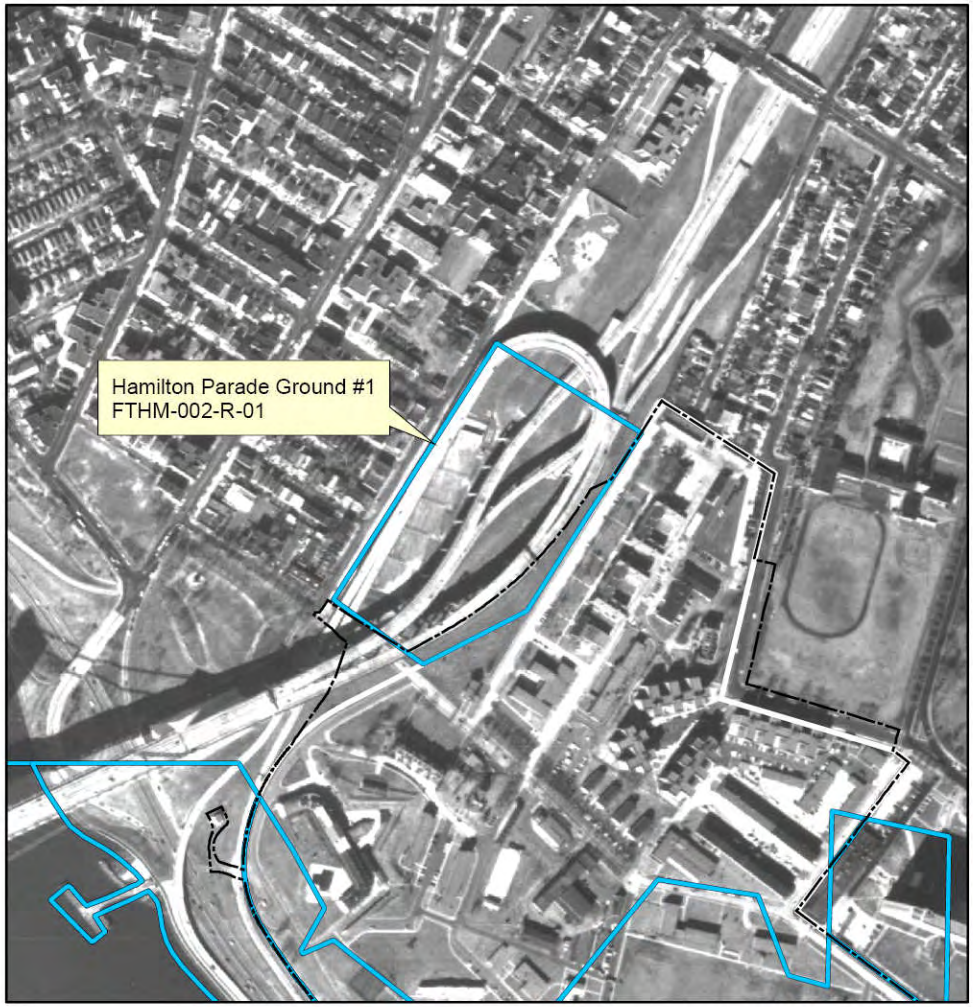
Senior: SM

Source Document:
EDR, 2006

Figure 4-8
Hamilton Parade Ground #1
Fort Hamilton, NY



1944



1966

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

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0 50 100 200 300 400 Meters

0 350 700 1,400 Feet

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Senior: SM

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Legend

CTT Boundary

Installation Fenceline

Source Document:
EDR, 2006

Figure 4-9
Hamilton Parade Ground #1
1944 and 1966
Fort Hamilton, NY

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Legend

- CTT Boundary
- CTT Site - Transferred
- Installation Fenceline

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0 25 50 100 150 Meters

0 125 250 500 Feet

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Date: 08/23/07
Created: JMW
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Senior: SM

Source Document:
EDR, 2006

Figure 4-10
Hamilton Training Field
Fort Hamilton, NY

4.4. HAMILTON TRANSFERRED COMPLEX (FTHM-004-R-01)

The Hamilton Transferred Complex defined in the *CTT Range Inventory Report* included any portion of land that lies within the inferred firing fans of the former batteries at the fort (Figure 4-11). As defined, this land area includes property immediately adjacent to the southern boundary of Fort Hamilton up to the shoreline of the Lower New York Harbor, and portions of Staten Island that fall within the inferred range of the guns. According to the *CTT Range Inventory Report*, the complex occupies 609 acres. At present, the location is developed with residential buildings, parking lots, and a divided highway known as the Belt Parkway.

The batteries were erected and used for harbor defense as described in Section 4.1.1. Based on the reviewed historical records, the guns at Fort Hamilton were not used to fire onto the land (Appendix A records, and *ASR*). No firing could reasonably have been done from Fort Hamilton across the former Fort Wadsworth across the Narrows onto Staten Island for training purposes. The training records obtained for the HRR show that training used water targets (described in Section 4.5). Although the land area in question was covered by the firing fans, firing onto land was not within the normal operating procedures of the types of guns emplaced in the batteries (Coastal Defense Artillery web resources; interviews with Museum Historian, and National Park Service Historian; Section 3.1.2). It is important to note that the fired rounds from the batteries were inert. Therefore, even if rounds were fired into any portion of the Hamilton Transferred Complex they would not constitute MEC.

The land that rests between the former batteries in Brooklyn and the open water of the Lower New York Harbor also are not expected to contain MEC of any type. The land was not in existence prior to the 1930s, when the road was developed along the shoreline. Comparison of the installation map from 1892—when the batteries were actively firing training rounds—and the current shoreline establish that the portion of the Hamilton Closed Complex adjacent to the installation did not even exist when the batteries were active (Figure 4-12). This figure illustrates changes to the land area between the historic batteries, depicted in the 1892 map, and the current shoreline. These land areas were filled as part of the building of Shore Road and the Belt Parkway, which began in the 1930s. After the 1930s, only two batteries (Livingston and Griffin) still had large guns in place for harbor defense. According to Figure 4-12 and the *ICRMP* (DPW, 2005), about 14 feet of fill were emplaced at the southern edge of Fort Hamilton to accommodate the construction of the parkway.

Based on historical training records, personnel interviews, and geographic data, it is concluded that the Hamilton Transferred Complex was not used by Fort Hamilton as an artillery training range. Consequently, neither MEC nor MC is suspected to be present in these areas, and the site is not eligible for further investigation under the MMRP. This information and subsequent analysis is believed to be of high quality with little uncertainty.

4.5. HAMILTON TRANSFERRED COMPLEX-OW (FTHM-005-R-01)

The Hamilton Transferred Area-OW is the open water portion of the inferred firing fans. The *CTT Range Inventory Report* states that the site covers 2,174 acres of open water, as depicted in Figure 4-13. The water is the Lower New York Harbor and the Narrows, which lies between Brooklyn and Staten Island. At present, the location is used for recreational boating and commercial shipping purposes.

Several records were found describing firing from the large batteries at Fort Hamilton. In addition, maps were found that illustrate the firing fans from guns during WWII. These historical resources were reviewed to determine the potential for MEC from test firing at Fort Hamilton.

Section 4.1.1 provides a general summary of the gun sizes and types emplaced at the batteries at Fort Hamilton. The following discussion focuses on the firing of the guns, from which the HRR research can derive an assessment of the potential for MEC within the gun firing fans.

During the mid-1800s, substantial improvements were being made to the casting of increasingly larger guns. Of particular note is the test firing of the 10-, 15- and 20-inch Rodman guns at Fort Hamilton, the latter of which is the largest gun in the coastal defense system. Only three 20-inch Rodman guns were made, one of which is still on display outside of Fort Hamilton. This gun was tested at Fort Hamilton on October 25, 1864 (Webster, 1962). The gun was fired three times on this day: once with a 100-pound blank charge, once with a 50-pound charge and a 1,080-pound solid shot at zero elevation, and once with 100-pounds of powder and a solid shot. The final shot fell at approximately 3.5 miles from the gun in about 24 seconds. Additional testing of the 20-inch Rodman occurred on October 27, 1864, with only two shots fired. Both shots were solid charges with the gun at zero elevation. The final firing of this gun occurred in March 1867, with a maximum range of 8,000 yards. This gun was never fired at a target, nor was it used routinely in coastal defense due to its ponderous size, and the long time necessary to aim (Webster, 1962). In short, no live shells were shot from this large gun at Fort Hamilton. The solid shot does not constitute MEC.

Based on historical correspondence (Appendix B, FHN00024) on October 10, 1867, two 15-inch Rodman guns were test fired at the New Battery at Fort Hamilton (in conjunction with tests of 10- and 15-inch guns at nearby Fort Wadsworth). Live projectiles were not used during these tests.

The first gun test split the pintle, and ‘caused settlement’ of the traverse stones (i.e., damaged the gun support). The second gun split the front of the chassis when fired. Each gun was fired once, with test charges. Clearly, the large guns were inconvenient to use until improvements were made to the gun carriages.

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Legend

- CTT Boundary
- CTT Site - Transferred
- Installation Fenceline

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1:25,000

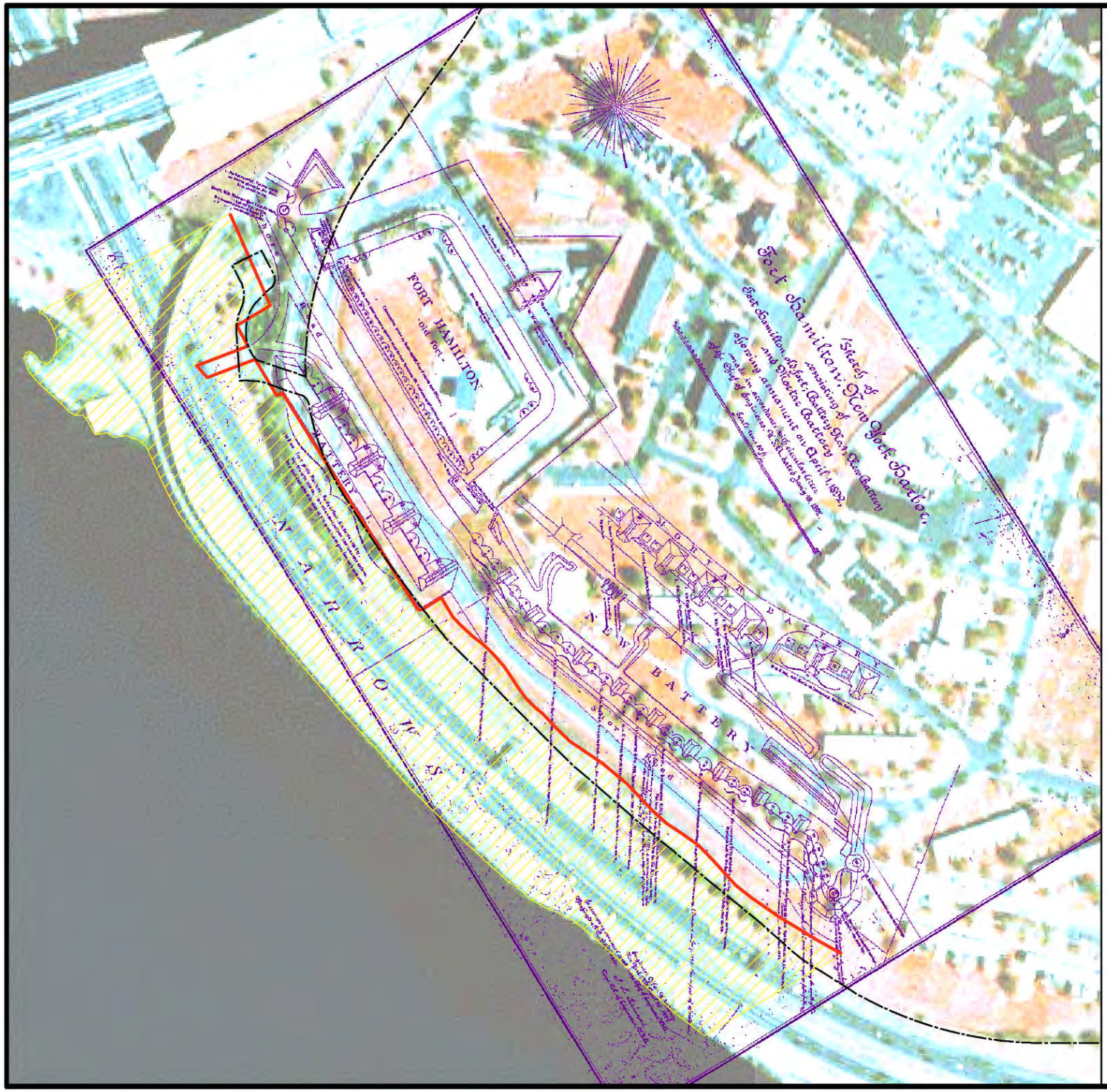
0 500 1,000 Meters

0 1,000 2,000 4,000 Feet

File: G:\15900215_MMRP\15298910_FtHamilton\MXD\
FtHamilton_Fig4-11.mxd
Date: 08/23/07
Created: JMW
Checked: RG
Senior: SM

Source Document:
EDR, 2006

Figure 4-11
Hamilton Transferred Complex
Fort Hamilton, NY



URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

Legend

- 1892 Shoreline
- Area of Fill
- Installation Fenceline

Note: Aerial photograph provides current shoreline.

N
W E
S

1:3,000

0 30 60 120 Meters

0 125 250 500 Feet

File: G:\15900215_MMRP\15298910_FtHamilton\MXD\FtHamilton_Fig4-12.mxd
Date: 08/23/07
Created: JMW
Checked: RG
Senior: SM

Source Documents:
EDR, 2006 and
ASR 393, 1998

Figure 4-12
Area of Fill from
1892 Map
Fort Hamilton, NY

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

Legend

- CTT Boundary
- CTT Site - Transferred
- Installation Fenceline

N
W E
S

1:25,000

0 500 1,000 Meters

0 1,000 2,000 4,000 Feet

File: G:\15900215_MMRP\15298910_FtHamilton\MXD\FtHamilton_Fig4-13.mxd
Date: 08/23/07
Created: JMW
Checked: RG
Senior: SM

Source Document:
EDR, 2006

Figure 4-13
Hamilton Transferred Complex-OW
Fort Hamilton, NY

The archives search found an 1894 letter (Appendix B, FHN00018) referring to artillery practice. In the letter from the Acting Artillery Officer, Fort Hamilton, to the military Chief of Engineers, Washington, DC, a request was made to make alterations to specific batteries because 8-inch rifled guns needed to be moved. The letter is of interest because he refers to "annual artillery practice." The guns in question were "exclusively used since 1890" for the annual practice. This suggests that artillery practice was an annual event at the time.

For subsequent years, the National Archives Search identified reports of artillery practice from 1896, 1900, 1901, 1903, and 1904 (Appendix A). It is unlikely that these records constitute the entire practice history; instead, it is assumed that other reports were not on file. However, these few documents provide insight into the mode of practice from the large guns at Fort Hamilton. All of the practice records were compiled, and observations regarding training were made. Table 4-2 provides a summary of the pertinent information from these firing records; full records as retrieved from the archival resources are provided in Appendix A, as noted in the final column of the table.

The training records from 1909 are not recorded in Table 4-2 because these state that training was performed at Fort Hancock for the Fort Hamilton units listed. The format of the training records from 1909 is similar to the earlier records, but references are clearly made to batteries at Fort Hancock. In light of these records, and the notation from Mr. Hoffman at Fort Hancock regarding training (interview in Section 3.2.5), it appears that training of artillery personnel at Fort Hamilton very likely transferred to the more remote location of Fort Hancock in Sandy Hook, New Jersey, shortly after the turn of the century. Web-based research indicates that in the early 1900s Fort Tilden (Long Island, New York) training was hampered by civilian complaints regarding damage (e.g., broken windows and china). It is possible that Fort Hamilton, with its relatively more urban setting than Fort Tilden, found that its close relationship to the Brooklyn neighborhoods restricted training as the area became more developed. This is also consistent with demographic reports from the *ICRMP* (DPW, 2005).

The training records indicate that artillery training activities at Fort Hamilton exclusively used solid cast iron projectiles. Records reviewed do not indicate projectiles were fuzed or HE-configured. Cast iron projectiles are inert and do not contain explosive material, and therefore, do not qualify as MEC. They are considered munitions debris.

Table 4-2. Summary of Training Records, Fort Hamilton, NY

Date	Gun	Projectile	Distance Fired (yards)	Target Description	Appendix A Report Page
08/25/1896	15-inch	Not noted	3,067 – 3,415	No indication of target	FHN00138
09/03/1896	Not noted	Not noted	781 – 1,171	No indication of target	FHN00138
8/10/1900	10-inch	5 Parrott 6 Cast Iron shot	4,660 – 6,630	10’ square	FHN00088
8/10/1900	10-inch	Parrott	4,670	10’ square stationary triangular	FHN00094 FHN00095
8/11/1900	10-inch	Cast Iron Shot	6,700	10’ square stationary triangular	FHN00085
8/11/1900	10-inch	Parrott	4,590	10’ square stationary triangular	FHN00086
8/11/1900	10-inch	Solid Shot	6,530	10’ square stationary triangular	FHN00094 FHN00095
8/13/1900	Rapid fire	Cast Iron Shell	6,700	10’ square stationary triangular	FHN00083
8/13/1900	4.7-inch Armstrong	Cast Iron Shell	6,700	10’ square stationary triangular	FHN00094 FHN00095
9/1/1900	8-inch converted rifle	Eureka Cast Iron Shot	3,970 – 4,000	10’ square stationary triangular	FHN00096
9/1/1900	8-inch converted rifle	Eureka Cast Iron Shot	3,970 – 4,000	10’ square stationary triangular	FHN00096
9/1/1900	8-inch converted rifle	Eureka Cast Iron Shot	4,030 – 4,300	10’ square stationary triangular	FHN00099
3/9/1901	8-inch converted rifle	Eureka Cast Iron Shot	4,000	10’ square	FHN00090
3/13/1901	4.7-inch Armstrong	Cast Iron Shot	Not noted	10’ square	FHN00090
10/1/1901	8-inch converted rifle	Cast Iron Shot, Eureka	3,835 – 3,855	10’ square base floating pyramid	FHN00131 FHN00132
10/1/1901	8-inch converted rifle	Eureka	4,060 – 4,080	10’ square base floating pyramid	FHN00133 FHN00134
10/1/1901	10-inch	Cast Iron Shot (Parrott)	4,985	10’ square base floating pyramid	FHN00135 FHN00136
10/21/1901	8-inch converted rifle	Cast Iron Shot,	3,700 – 3,765	10’ square base floating pyramid	FHN00129 FHN00130
11/4/1901	8-inch converted rifle	Cast Iron Shell	4,515 – 4,575	10’ square base floating pyramid	FHN00127 FHN00128
12/23/1903	12-inch	Cast Iron Shell	8,200 – 8,740	4 moored targets	FHN00120
6/30/1904	2.244” - 6 – pds., model 1900	Cast Iron Shell	1,700 – 1,900	4 mph towed 5’ X 20’	FHN00123

Notes: The original records may also list the battery name, the azimuth of the gun, and travel time of the projectile.

Changes were made to the batteries during WWII, when defense focused increasingly on air attacks over water attacks. All but two of the batteries, Griffin and Livingston, were taken out of service. Guns remaining at these locations were part of a comprehensive coastal system to defend the United States. The Harbor Defense Museum provided a document called “Annex A, Amendment to *Harbor Defense projects for Harbor Defenses included in the New York-*

Narragansett Bay Area, Parts I-V." This document illustrates the coverage of guns throughout the waters of Lower New York Harbor, down to Sandy Hook, and slightly east along Long Island Sound (Figures 4-14 and 4-15).

The anti-aircraft artillery covered an enormous area—significantly larger than that presented in the *CTT Range Inventory Report*. Moreover, there is overlap in coverage from guns from other installations, such as Fort Wadsworth, which was across the Narrows, and Fort Hancock, which was to the south in Sandy Hook, New Jersey. No reports of firing during WWII were identified, and record keeping for this era is expected to be more adequately represented in the archives than older records (which were found). As in the pre-WWII era, although guns at Fort Hamilton had the potential to cover large areas of open water and adjacent land, there is no evidence that these were used for training or live fire. By this time, the surrounding population had grown considerably and would make firing in most areas unsafe. Additionally, there were other more suitable and remote coastal defense locations where training was much more likely to occur.

Based on historical records including correspondence and web-based research, it is concluded that the Hamilton Transferred Complex-OW was not used by Fort Hamilton as an artillery training range. This is based primarily on historical evidence that training activities were limited to inert projectiles, which are munitions debris. In addition, there is no historical evidence that anti-aircraft batteries in place during WWII fired into the water. Consequently, neither MEC nor MC is suspected to be present in these areas, and the site is not eligible for further investigation under the MMRP. This information and subsequent analysis is believed to be moderately reliable.

4.6. OTHER AREAS OF INTEREST

Two other potential ranges were identified from HRR resources and they are addressed in this section.

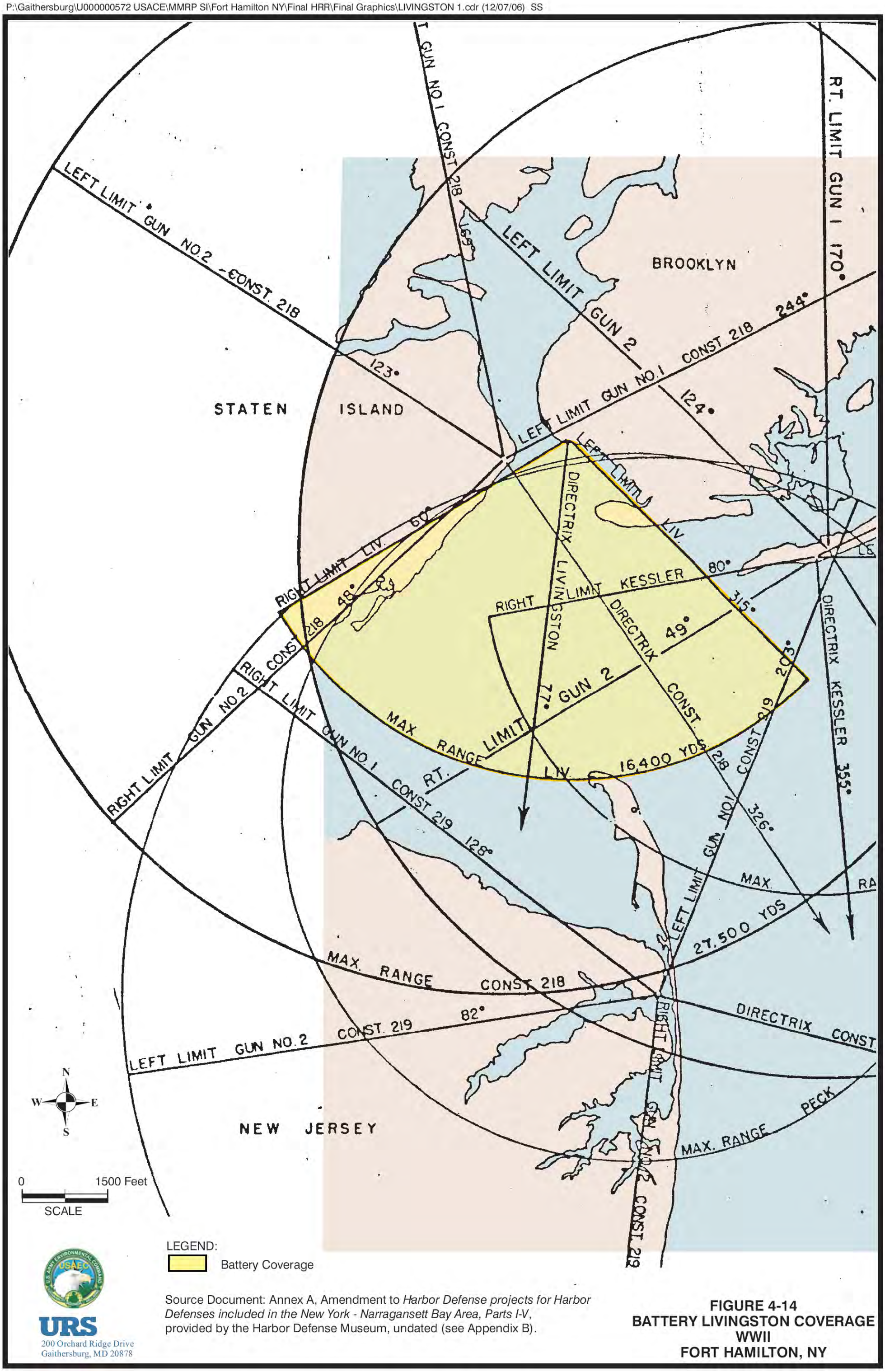
Several pieces of correspondence from the 1880s refer to a firing range at Fort Hamilton, the location of which is not certain. An extract from Inspector of Target Practice Thomas Ward's report of an inspection in December 1883 (Appendix A, FHN00142) states that the rifle range used in 600-yard practice is "*very dangerous.*" He suggests that a "*safer range can be established … by moving the butt, which is a good one to a suitable point back of, or South East of the old redoubt which will throw the line of fire clear of all public buildings and highways.*" In support, S.E. Allen 2nd Lieutenant, 5th Artillery notes that he has had experience at the range where "*three lookouts are a necessary precaution, as three separate lines of travel, used by members of the garrison, cross the line of fire.*" He continues that despite the lookouts, people have come into the line of fire. Specifically, those "*approaching the range along the road leading around to Light Battery Stables, or among the storehouses, are screened from view of*

those at the firing point." His letter also states that "*all the officers' quarters, except those inside of the fort, and most of the government store-houses [are] within a hundred yards of the line of fire and butt.*" As this controversy unfolded, Lieutenant Colonel R. Jones was sent to Fort Hamilton by Lieutenant General Sheridan of the Headquarters Department of the East. Jones reports that there are two ranges: 500- and 600-yard. The line of fire of the 600-yard range passed "*between the Quartermaster's stable and a wood shed*" and crossed "*three roads which are much traversed*." He states that moving the range to the Redoubt would be too expensive, and would then endanger the residents of 'Goose Hill.' No reference to Goose Hill could be found in maps of the area. An alternative plan for placing the range at the edge of Fort Hamilton was proposed at the time.

Using the historical maps, an effort was made to locate this very old range. In 1871, the site plan provided in a letter did not show a range or an area with a target butt near the Quartermaster's Stable (ASR 368). Moreover, a location near the stable does not have the 'three roads' mentioned in the correspondence. An 1892 map (ASR 393), while contemporary, does not include the entire footprint of Fort Hamilton. A map from 1899 has sufficient detail to show the Quartermaster's Stable referred to in the correspondence, but represents over a decade after the correspondence occurred. This map would place that range to the southeast of Parade Ground #1, which is more consistent with the area of operations of the pre-1900s era at the fort. At 600 yards from this area in any direction, the butt would have been beyond the contemporary boundary of Fort Hamilton. The direction of firing is unknown from the correspondence, as Goose Hill is not a known landmark. Based on local topography, this may have been to the northeast of the Parade Ground, or to the east at the approximate current location of the VA Hospital.

In short, although long distance firing certainly was practiced at Fort Hamilton in the 19th century, the records are insufficient to pinpoint a location. Use for rifle firing limits the potential to MC without MEC. Moreover, the substantial degree of disturbance to the area since the 1880s makes identification of a site impossible. The documentation is contained in this SI for completeness, but addition of a site to the MMRP is not reasonable based on the information at hand.

From more recent history, the HRR search found two military publicity photographs from 1952 showing firing of rifles at an outdoor area (Appendix A, FHN00012 and FHN00015). The depicted rifle firing is from a prone position in one photograph, and from a crouched position in the other. The photographs are identified as representing "members of the 370th Transportation Major Port undergoing carbine familiarization." Contemporary memoranda at Fort Hamilton did not indicate the presence of an outdoor firing range for rifle training. These records do indicate



LEGEND:

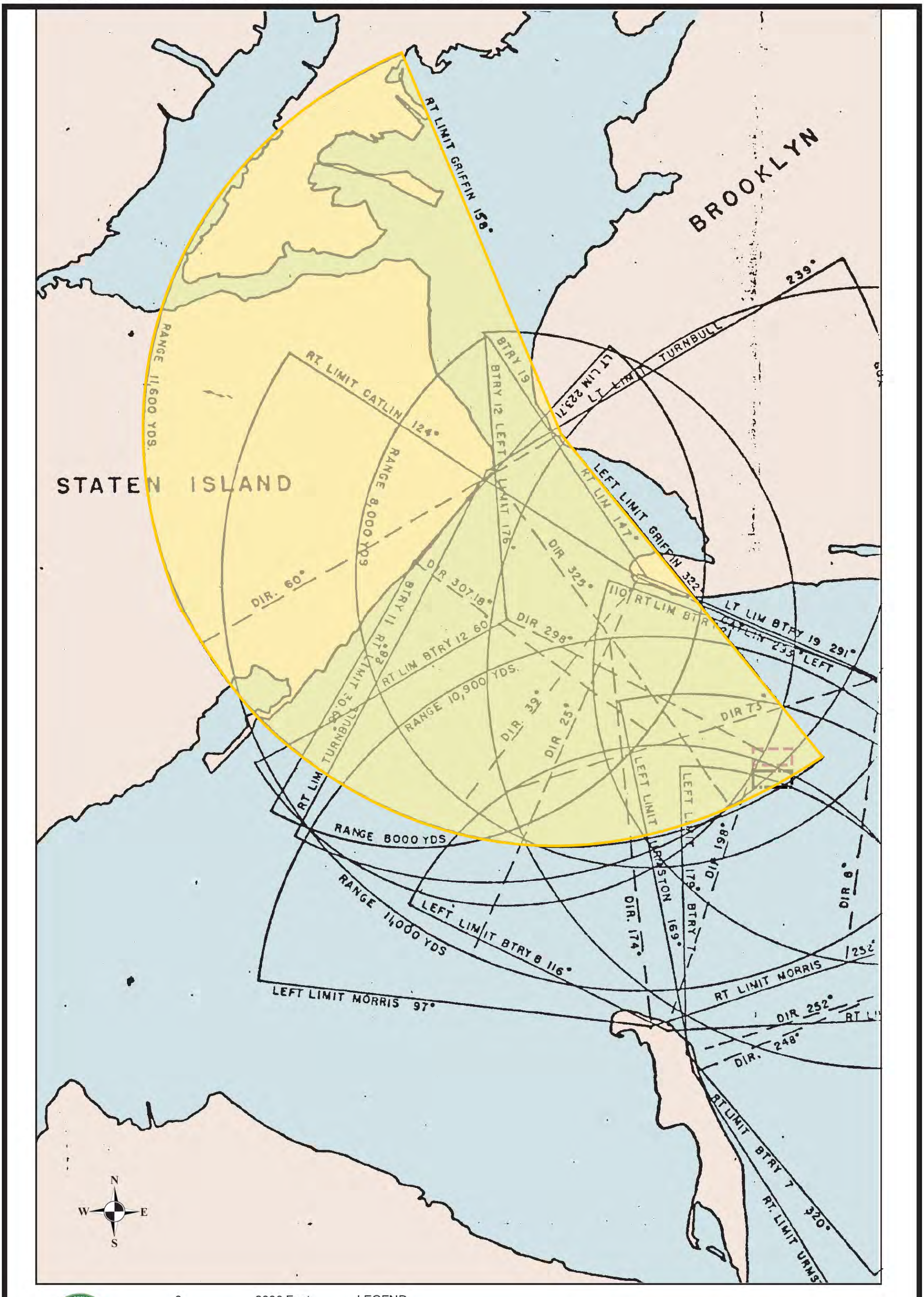
Battery Coverage

Source Document: Annex A, Amendment to *Harbor Defense projects for Harbor Defenses included in the New York - Narragansett Bay Area, Parts I-V*, provided by the Harbor Defense Museum, undated (see Appendix B).

FIGURE 4-14
BATTERY LIVINGSTON COVERAGE
WWII
FORT HAMILTON, NY

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

P:\Gaithersburg\U000000572 USACE\MMRP SI\Fort Hamilton NY\Final HRR\Final Graphics\GRIFFIN 1.cdr (12/07/06) SS



0 3000 Feet

SCALE

LEGEND:

Battery Coverage

Source Document: Annex A, Amendment to *Harbor Defense projects for Harbor Defenses included in the New York - Narragansett Bay Area, Parts I-V*, provided by the Harbor Defense Museum, undated (see Appendix B).

FIGURE 4-15
BATTERY GRIFFIN COVERAGE
WWII
FORT HAMILTON, NY

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

that there was an indoor firing range in the basement of the Building 402 (ASR 366). This was converted to a bowling alley. Neither a Post Map from 1953 (ASR 336) or a master plan document from 1958 (ASR 381) show any areas or buildings labeled as ranges. The Post Map does not show any areas large enough to accommodate firing.

In summary, the presence of a rifle range that operated in 1952 is implied by the presence of two publicity photographs. No clues regarding location are evident in the photograph, and contemporary maps do not corroborate the presence of an outdoor firing location. Due to the uncertain location and duration of such firing, no range could be located based on the available information.

4.7. POTENTIAL MEC AND MC

Based on the comprehensive review of historical records—including aerial photographs, land use data, interviews, web-based research, etc.—it is concluded that the following sites were never used for training activities or live firing:

- Hamilton Closed Complex, FTHM-001-R-01: Parade Ground #2 and Training Field
- Hamilton Parade Ground #1, FTHM-002-R-01
- Hamilton Training Field, FTHM-003-R-01
- Hamilton Transferred Complex, FTHM-004-R-01
- Hamilton Transferred Complex-OW, FTHM-005-R-01

These sites are not eligible under the MMRP. This conclusion is based on information believed to be reliable and of high quality.

One site, Hamilton Closed Complex: Batteries, does qualify as an MRS because it was once used for training activities. However, based on the historical data regarding the training, it is considered unlikely that MEC or MC is present. The only possible occurrence of MEC and MC would be from improperly disposed powder bags; however, extensive site disturbance and development makes this scenario highly unlikely.

The *CTT Range Inventory Report* identified potential range areas primarily on the basis of a review of the *ASR* summary maps. However, text in the *ASR* and corroborative contemporary correspondence and records identified during the Archives Search indicate that there is no potential for MEC or MC to be found at any of the locations. In all cases, the conclusions are based on contemporary historical information. In most cases, specific activities that would constitute training were noted in the historical data, and suggested that training was minimal, or did not occur at all. The information and resources on which the MMRP Range Summary is based are considered highly reliable.

None of the sites, with the exception of the Batteries site, were used for training or live firing. Although training did occur at the Batteries, MEC and MC would be limited to discarded powder charges. The potential for MEC and MC at this site is considered unlikely, as none was encountered during extensive site redevelopment. On the basis of these findings, the batteries site is recommended for no further action, and the remaining sites are ineligible under the MMRP. Furthermore, no additional ranges, training areas, or locations with potential MEC or MC were identified at Fort Hamilton.

5. CONCEPTUAL SITE MODEL

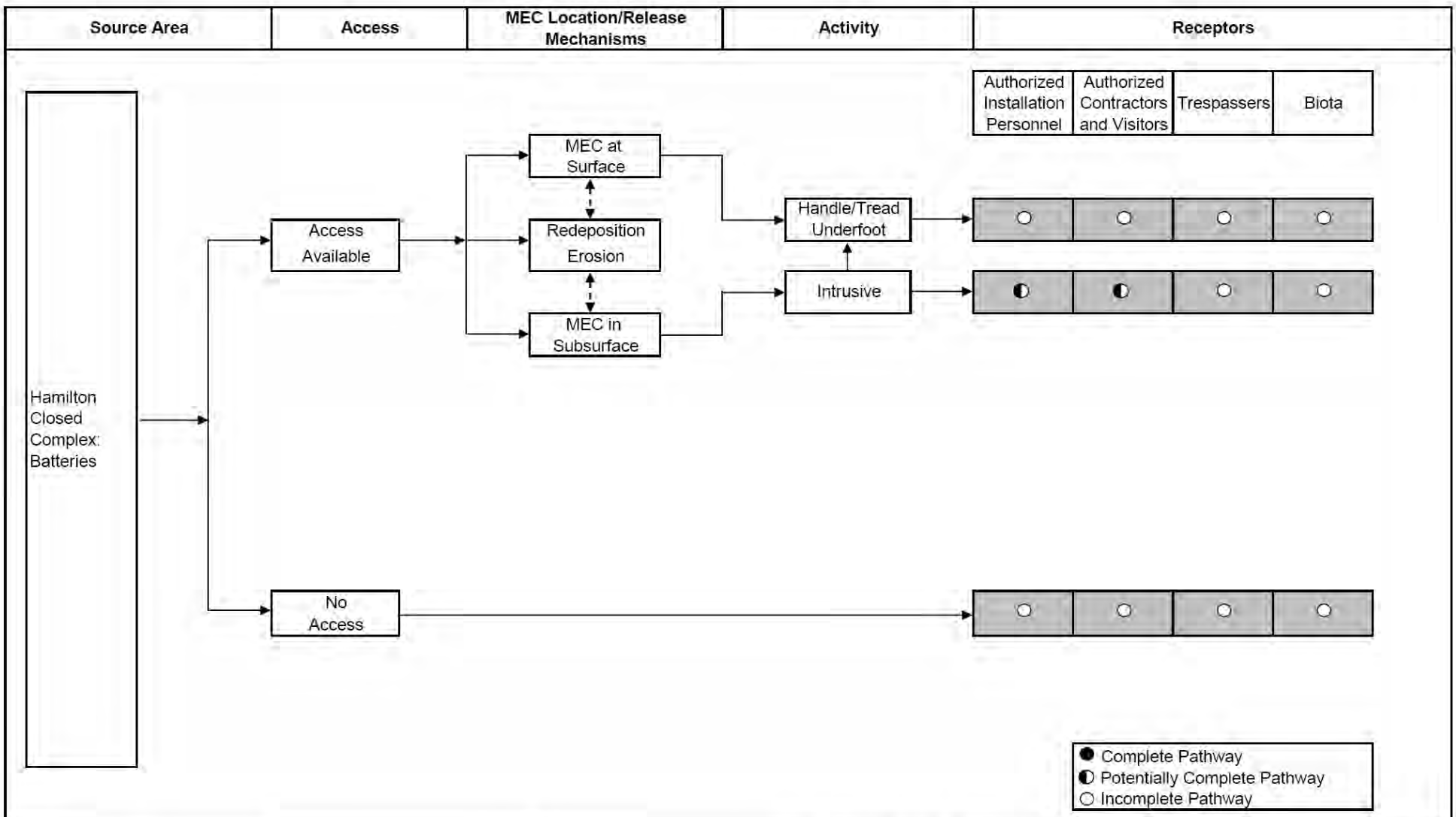
A site CSM was developed for MEC and MC at one site at Fort Hamilton, the batteries within the Hamilton Closed Complex. At this location, the only possible occurrence would be from undocumented, improperly disposed powder bags although significant site development makes this scenario highly unlikely. Thus, should remnants of MEC or MC exist, these would be buried since all surface areas have been extensively disturbed. Being buried, transport of MC beyond the site is not feasible via runoff. Groundwater is not a drinking water supply at Fort Hamilton and is an incomplete pathway.

Potential receptors are limited. There is little or no available ecological habitat since the site is highly developed and vegetation is limited to lawns, garden beds, and trees. Ecological receptors would be invertebrates and burrowing mammals, trees (uptake through roots), and those animals that might feed off these contaminated organisms.

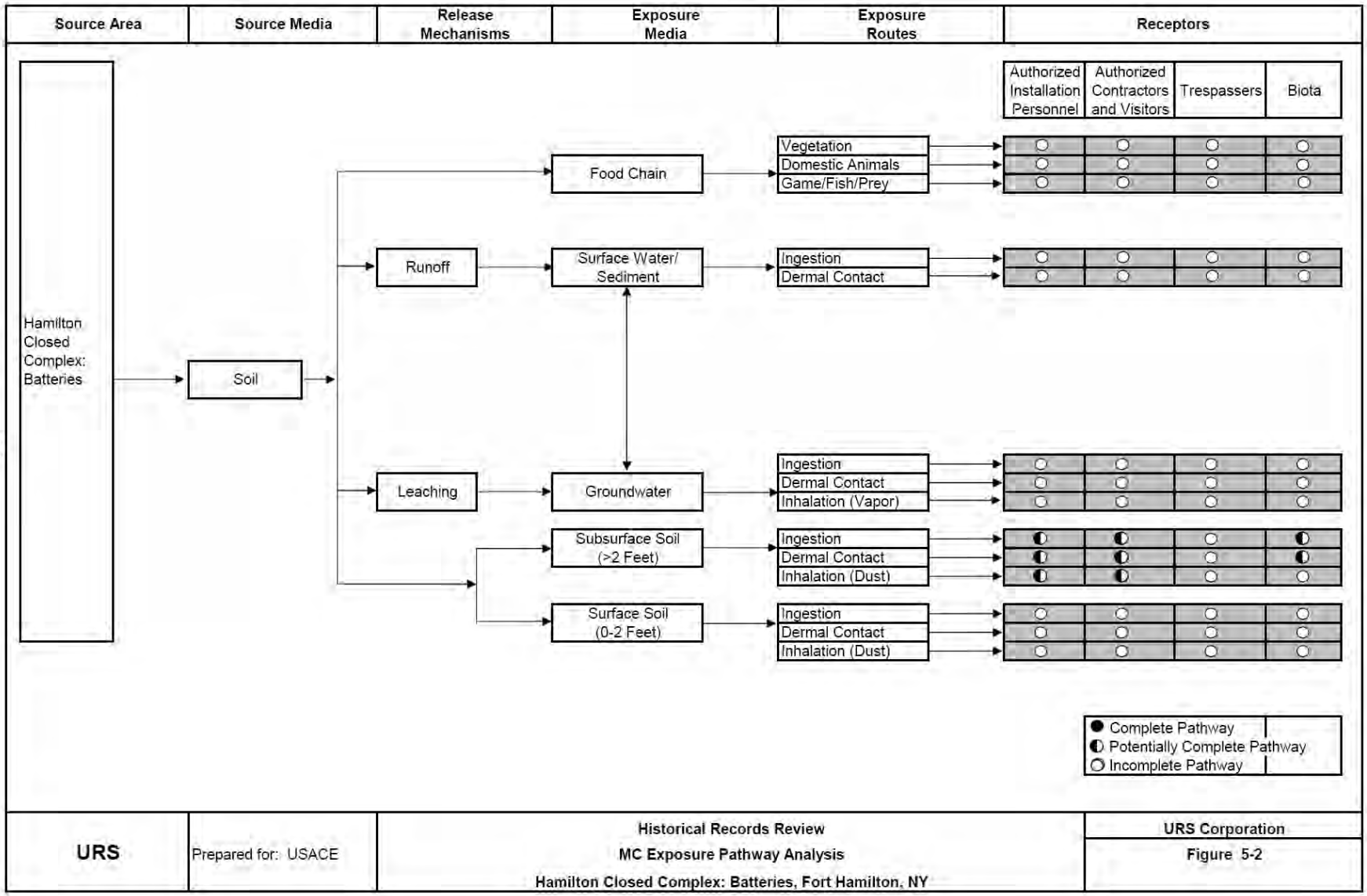
Human exposure would be confined to contractors or Base workers digging in the soil, e.g., utility repair. Visitors and facility residents would not be expected to come into contact with subsurface soil. Fort Hamilton is a secure installation with 100 percent ID check, therefore, trespassers are not considered a potential receptor.

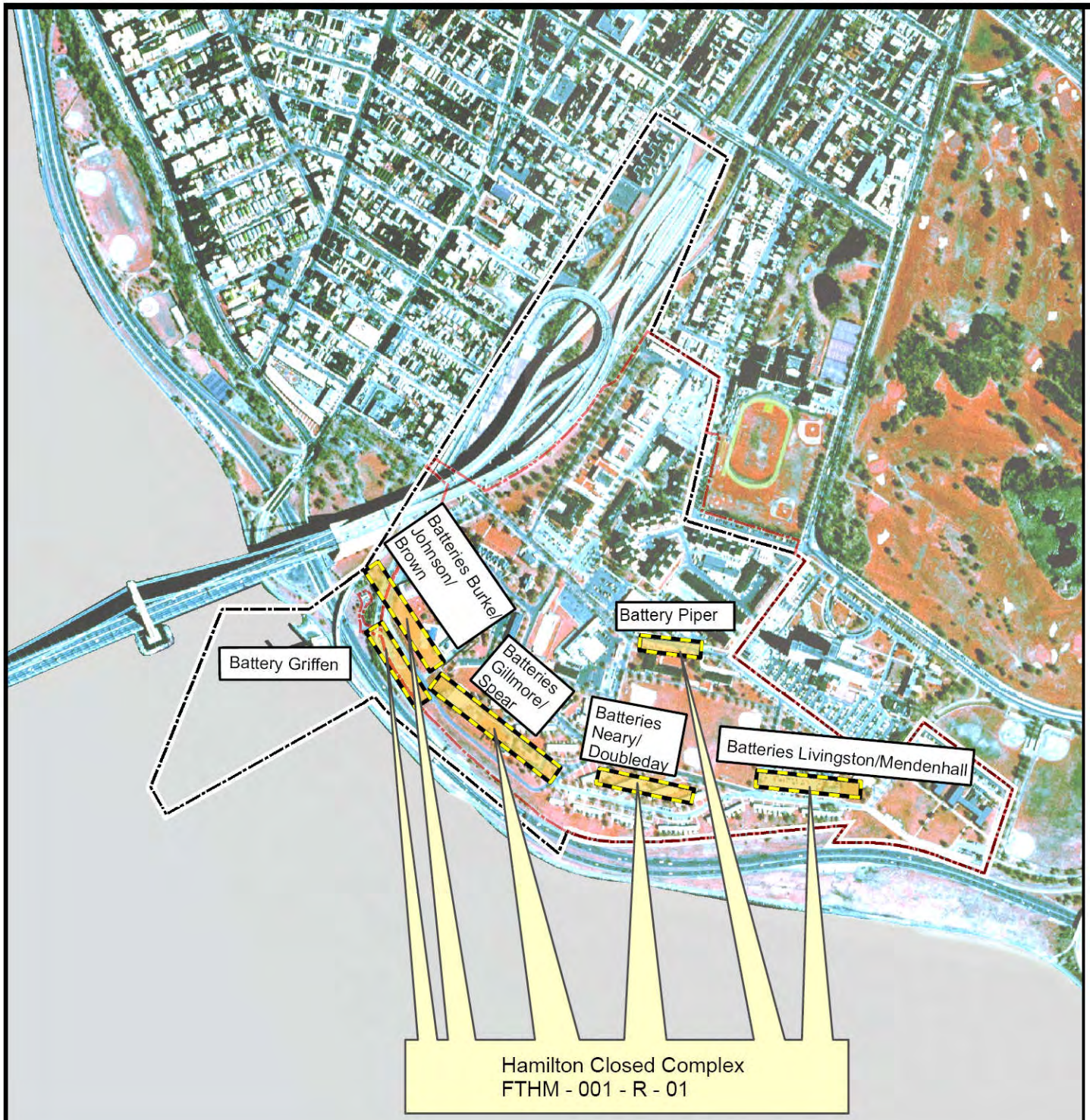
These exposure pathways are graphically summarized in Figures 5-1 and 5-2. Future land use is expected to be consistent with current land use. Thus, it unlikely that the exposure scenarios would change in the foreseeable future. Fort Hamilton is the only active army installation within New York City and has a stable mission (see Section 2.1). The current plan is to increase the number of personnel assigned to Fort Hamilton.

Figure 5-3 shows the revised MRS boundaries, which include only the former batteries of the Hamilton Closed Complex. Although a very small portion of two of the western-most batteries falls outside the fenceline of the installation, they are within government owned property (see also Figure 7-1). The fact remains that the batteries were demolished and the soil highly disturbed prior to the transfer of property. In addition, the findings of the HRR, and the limited potential exposure pathways identified in the CSM above, indicate that a no further action decision can be made for the entire site. Thus, there is little reason to disassociate the very small parts of the batteries in the transferred complex from the majority of the site. This also maintains consistency with site boundary designations used in the *CTT Range Inventory Report* and herein.



URS	Prepared for: USACE	Historical Records Review MEC Exposure Pathway Analysis Hamilton Closed Complex: Batteries, Fort Hamilton, NY	URS Corporation Figure 5-1


Source Area
Source Media
Release Mechanisms
Exposure Media
Exposure Routes
Receptors
Authorized Installation Personnel
Authorized Contractors and Visitors
Trespassers
Biota
Hamilton Closed Complex: Batteries
Soil
Runoff
Leaching
Food Chain
Surface Water/ Sediment
Groundwater
Subsurface Soil (>2 Feet)
Surface Soil (0-2 Feet)
Vegetation
Domestic Animals
Game/Fish/Prey
Ingestion
Dermal Contact
Inhalation (Vapor)
Inhalation (Dust)
Complete Pathway
Potentially Complete Pathway
Incomplete Pathway
URS
Prepared for: USACE
Historical Records Review
MC Exposure Pathway Analysis
Hamilton Closed Complex: Batteries, Fort Hamilton, NY
URS Corporation
Figure 5-2



URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878

Legend

- MRS Boundary
- Installation Fenceline
- Government Owned Property

N
W E
S

1:10,000

0 100 200 400 Meters

0 0.125 0.25 Miles

G:\15900215_MMRP\15298910_FtHamilton\MXD\
FtHamilton_Fig5-03.mxd
Date: 10/09/07
Created: TZ
Checked: RG
Senior: SM

Source Document:
CTT Range Inventory, 2003

Figure 5-3
Revised MRS Boundary
Hamilton Closed Complex
Fort Hamilton, NY

6. MRSPP SCORING SUMMARY

Based on information obtained during the HRR and previously completed investigations, MRSPP ranking was completed for the batteries portion of the Hamilton Closed Complex, the only eligible MRS. No scoring is applied for sites that are not eligible for MMRP.

The MRSPP priority rankings are used by the DoD to prioritize sites for further action. In general, the lower the numerical ranking, the higher priority the site is given. In compliance with 32 CFR §179.5, the MRSPP score(s) for the MRSs are considered interim pending stakeholder input. All MRSPP worksheets are included as Appendix C (CD only), and Table 6-1 summarizes the MRSPP priority ranking.

Table 6-1: Summary of MRS and MRSPP Scores

MRS Name	AEDB-R Number	MRS Priority Ranking
Hamilton Closed Complex: Batteries	FTHM-001-R-01	No known or suspected hazard

7. CONCLUSIONS AND RECOMMENDATIONS

A summary of the SI findings and recommendations are provided in Tables 7-1 and 7-2. The research conducted during the HRR indicated that four of the five MRSs were ineligible for the MMRP because of strong evidence that training never occurred at these sites, and/or MEC and MC were never released. The only MMRP eligible MRS is the Hamilton Closed Complex (FTHM-001-R-01).

Table 7-1. MMRP Summary of SI Findings

MRS (AEDB-R Number)	Acreage CTT/SI	Basis for Acreage Changes	Primary MEC and MC	
			MEC	MC
Hamilton Closed Complex (FTHM-001-R-01)	42/8	Acreage is reduced to only include the batteries subarea.	None. MEC is unlikely.	None. MC is unlikely.
Hamilton Parade Ground #1 (FTHM-002-R-01)	15/0	Site ineligible for MMRP because training/live firing did not occur at the site.	None.	None.
Hamilton Training Field (FTHM-003-R-01)	5/0	Site ineligible for MMRP because training/live firing did not occur at the site.	None.	None.
Hamilton Transferred Complex (FTHM-004-R-01)	609/0	Site ineligible for MMRP because round fired from the batteries were inert.	None.	None.
Hamilton Transferred Complex-OW (FTHM-005-R-01)	2174/0	Site ineligible for MMRP because projectiles fired were inert.	None.	None.

Table 7-2. MMRP Summary of SI Recommendations

MRS (AEDB-R Number)	MRSPP Priority	Recommendations		Basis for Recommendations	
		MEC	MC	MEC	MC
Hamilton Closed Complex (FTHM-001-R-01)	No Known or Suspected Hazard	No Further Action	No Further Action	Artillery firing at former batteries was infrequent and limited to powder charges and inert projectiles, MEC is not suspected to be present.	Artillery firing at former batteries was infrequent and limited to powder charges and inert projectiles, MC is not suspected to be present.

MRS (AEDB-R Number)	MRSPP Priority	Recommendations		Basis for Recommendations	
		MEC	MC	MEC	MC
Hamilton Training Field (FTHM-003-R-01)	NA	Ineligible for MMRP	Ineligible for MMRP	MEC not a concern, training/live firing did not occur at this site.	MC not a concern, training/live firing did not occur at this site.
Hamilton Transferred Complex (FTHM-004-R-01)	NA	Ineligible for MMRP	Ineligible for MMRP	MEC not a concern, training/live firing occurred at the site. Rounds fired from the batteries were inert.	MC not a concern, training/live firing occurred at the site. Rounds fired from the batteries were inert.
Hamilton Transferred Complex-OW (FTHM-005-R-01)	NA	Ineligible for MMRP	Ineligible for MMRP	MEC not a concern, training/live firing occurred at the site. Projectiles fired were inert.	MC not a concern, training/live firing occurred at the site. Projectiles fired were inert.

Figure 7-1 shows the revised boundaries of the single eligible MRS (Hamilton Closed Complex (FTHM-001-R-01)) as based on the SI and includes the sites determined to be ineligible MR sites. A summary of the SI findings for each site (both eligible and ineligible) addressed during the SI is presented in the following sections.

7.1. HAMILTON CLOSED COMPLEX (FTHM-001-R-01)

The Hamilton Closed Complex was identified as a potential MMRP site in the *CTT Range Inventory Report*. The Hamilton Closed Complex identified in the *CTT Range Inventory Report* was composed of three distinct sites: the former batteries, a former parade ground, and a former training area. The HRR found substantial historical information regarding these areas and their use. Based on the reviewed data, artillery firing did occur at the Batteries site but the evidence indicates only infrequent activity limited to powder charges and inert projectiles.

MEC and MC are unlikely at two subareas (Parade Ground #2 and the Training Field) or other undesignated areas within the Hamilton Closed Complex. Firing activities did not occur in any of these areas, thus they are not eligible under the MMRP.

The potential exists for MEC and MC to be present at the batteries area since training that employed powder bags did occur in this area. However, historical research does not indicate improper disposal of powder bags occurred at Fort Hamilton. In addition, buried powder bags have never been discovered during redevelopment activities. In these areas, the ground

has been significantly redeveloped to depths from 2 to 10 feet. Therefore, MEC or MC is not suspected at the site.

The MRS Priority Alternative Rating of "No Known or Suspected Hazard" was scored for the batteries portion of the Hamilton Closed Complex

Based on the type of training activities and subsequent site disturbance, a no further action recommendation is made for this site.

7.2. HAMILTON PARADE GROUND #1 (FTHM-002-R-01)

The Hamilton Parade Ground #1 was identified as a potential MMRP site in the *CTT Range Inventory Report*. It is 15 acres of transferred property outside the northwestern corner of the Fort Hamilton installation boundary under the approach ramps for the Verrazano Narrows Bridge.

Historical evidence indicates that this site was not used for training or live firing, and as a result, neither MEC nor MC is likely to be present. The site is not eligible for further study under the MMRP.

7.3. HAMILTON TRAINING FIELD (FTHM-003-R-01)

The Hamilton Training Field was identified as a potential MMRP site in the *CTT Range Inventory Report*. This is the same Training Field identified as part of the Hamilton Closed Complex, but it the portion that was transferred from U.S. Army control when the property was transferred to the Veteran's Hospital. Based on aerial photographs and historical land use, it is concluded that Hamilton Training Field was not used for small arms training due to the proximity of this area to the barracks and officer's quarters.

Historical evidence indicates that this site was not used for training or live firing, and as a result, neither MEC nor MC is likely to be present. The site is not eligible under the MMRP.

7.4. HAMILTON TRANSFERRED COMPLEX (FTHM-004-R-01)

The Hamilton Transferred Complex is the land portion of the ranges emanating from the batteries at Fort Hamilton. Neither MEC nor MC is likely to be present in this area. The land area closest to the former batteries would have been too close to be fired on, and has been filled to accommodate Belt Parkway construction since the era when the large guns were used. The Staten Island portion of the Hamilton Transferred Complex that was noted in the *CTT Range Inventory Report* was not fired upon, and will not contain MEC or MC from activities at Fort Hamilton. In addition, any indirect fire from the batteries would have been inert rounds, which do not qualify as MEC or MC.

This site is not eligible for further study under the MMRP because it was never a target area and any indirect fire would have been from inert rounds.

7.5. HAMILTON TRANSFERRED COMPLEX-OW (FTHM-005-R-01)

The Hamilton Transferred Complex-OW is the open water portion of ranges emanating from the batteries at Fort Hamilton.

This MRS was used as a training range, however, historical records show only inert shells were fired from the batteries. Inert rounds do not qualify as MEC and MC, therefore, this site is not eligible for the MMRP.

Hamilton Parade Ground #1
(FTHM-002-R-01)
(Not MR eligible, no munitions use)

Hamilton Closed Complex
(FTHM-001-R-01)

Hamilton Training Field
(FTHM-003-R-01)
(Not MR eligible, no munitions use)

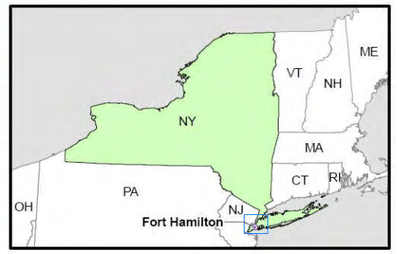
Hamilton Transferred Complex
(FTHM-04-R-01)
(Not MR eligible, no munitions use)

Hamilton Transferred Complex
(FTHM-005-R-01)
(Not MR eligible, no munitions use)

Former Fort
Wadsworth

Hamilton Transferred - OW
(FTHM-004-R-01)
(Not MR eligible, no munitions use)

URS
200 Orchard Ridge Drive
Gaithersburg, MD 20878



Legend

- Ineligible MR Site
- MRS Boundary
- Installation Fenceline
- Government Owned Property

N
W E
S

1:16,000

0 100 200 400 600 800 Meters

0 0.25 0.5 Miles

G:\15900215_MMRP\15298910_FtHamilton\MXD\
FtHamilton_Fig7-1.mxd
Date: 08/23/07
Created: JMW
Checked: RG
Senior: SM

Source Document:
CTT Range Inventory, 2003

Figure 7-1
Munitions Response Site
Fort Hamilton, NY

8. REFERENCES

Beers, Frederick W., 1873. *Atlas of Long Island, New York*. Beers, Comstock and Cline, New York.

Berhow, Mark A., 2000, *Modern American Seacoast Defenses: A List of Military Reservations and Concrete Gun Batteries*, 1890-1950

Cressey, George B., 1977. *Land Forms.* In **Geography of New York State**, edited by John H. Thompson, pp. 19-53. Paperback edition. Syracuse University Press, Syracuse.

Director of Public Works (DPW), 1999. *Final Environmental Baseline Survey, Fort Hamilton, New York*. February 1999.

DPW, 2005. *Integrated Cultural Resources Management Plan (ICRMP) for Fort Hamilton, Brooklyn, Kings County, New York.* Originally prepared by Panamerican Consultants, Inc in 1998 for Director of Public Works (DPW), U. S. Army Garrison Fort Hamilton. Updated by DPW September 2005.

Environmental Data Resources, Inc. (EDR), 2006. *The EDR Aerial Photo Decade Package*, the Standard in Environmental Risk Management Information. July 27, 2006.

Facility Engineers Office, Fort Hamilton, 1991. *Future Development Plans: Master Plan Narrative Fort Hamilton, Brooklyn, New York.* Facility Engineers Office, Fort Hamilton, Brooklyn, NY, with collaboration of: The Office of P. DeBellis, White Plains, NY. On File, Planner's Office, Fort Hamilton, NY.

Historic Preservation Office, Fort Hamilton, 1996. *Phase I (Identification Level) Archaeological Investigation High Sensitivity Zones Fort Hamilton Kings County, New York. Task Order No. 1 Archaeological Inventory*. U.S. Army Fort Hamilton, Directorate of Public Works, Environmental Division, Historic Preservation Office, Fort Hamilton Military Installation, Brooklyn, NY.

Hoffman, Thomas J., undated. *The Defenses of Sandy Hook*, National Park Service, U.S. Department of the Interior, www.nps.gov/gate, undated internet publication

ITRC, 2003. *Technical/Regulatory Guideline for Munitions Response Historical Records Review*, prepared by the Interstate Technology & Regulatory Council (ITRC) Unexploded Ordnance Team, 2003.

Klein, Terry H., A. Friedlander, and M. Bowers, 1986. *A Cultural Resource Overview and Management Plan for the U.S. Army Property, Fort Hamilton, Brooklyn, New York, Fort Totten, Queens, New York*. The Cultural Resource Group, Louis Berger & Associates, Inc., East Orange, NJ. Prepared for the National Park Service, Mid-Atlantic Region, Philadelphia.

Malcolm Pirnie, 2003. *Final Closed, Transferring, and Transferred Range/Site Inventory Report, Fort Hamilton, New York*, December 2003.

Parsons. 1998. *Final Integrated Cultural Resource Management Plan, Fort Hamilton, New York.*

Parsons Harland Bartholomew and Associates, 1998. *Fort Hamilton Environmental Baseline Report*

Robinson, Elisha. **1889 Atlas of Kings County, New York**. Elisha Robinson, New York.

Schieppati, Frank J., K. Nolte, M. A. Cinquino, R. J. Hanley, M. A. Steinback, E. V. Curtin, and K. L. Nelson, 1998. *Cultural Resources Investigations Including National Register Eligibility Assessment of Selected Buildings at Fort Hamilton, Brooklyn, Kings County, New York*. Panamerican Consultants, Inc., Depew, NY. Prepared for Barry A. Vittor & Associates, Inc., Mobile, AL, under contract to New York District, U.S. Army Corps of Engineers, New York.

Smith, Adam and Suzanne K. Loechl, 2000. *Fort Hamilton, NY: Historic Landscape Inventory*, prepared for CERL, September 2000

TechLaw, 2004a. *Property Eligibility Report, Hamilton Parade Ground #1 (FTHM-002-R-01), Fort Hamilton, NY*, Prepared for AEC, December 2004

TechLaw , 2004b. *Property Eligibility Report, Hamilton Transferred Complex (FTHM-004-R-01), Fort Hamilton, NY*, prepared for AEC, December 2004

TechLaw, 2004c. *Property Eligibility Report, Hamilton Training Field (FTHM-003-R-01), Fort Hamilton, NY*, prepared for AEC, December 2004

TRC Environmental Corporation, 1997. *Remedial Investigation Report for Denyse Wharf Sediments (Task 02-5), Fort Hamilton, Brooklyn, NY*, TRC Environmental Corporation, July 1997

U.S. Army Corps of Engineers (USACE), 1998. *Final Ordnance and Explosives Archives Search Report-Findings, Fort Hamilton, Brooklyn, New York*, September, 1998.

USACE-Mobile District, 2002. *Draft Environmental Baseline Survey of Army Property for the Residential Communities Initiative at Fort Hamilton, New York*

Webster, Donald B. **Rodman's Great Guns from Ordnance, July-August 1962**. Located at http://www.clpgh.org/exhibit/neighborhoods/strip/strip_n41.html

Appendix A: Archives Searched/Data Sources

(Provided on Enclosed Compact Disk)

Fort Hamilton
Archival Research Report
Heritage Research Center, Ltd.
September 13, 2006

Heritage Research Center, Ltd. conducted archival research related to this installation. The following lists the repositories visited and sources reviewed in that effort. The list reflects the entries/collections and boxes we actually reviewed. It should be noted that Heritage reviewed finding aids and catalogs extensively for each repository, entry and collection to identify potentially relevant materials for review. The time spent in each repository is noted in bold.

National Archives and Records Administration – College Park, MD – **66.25 hours**

Textual Branch

RG 51, Bureau of the Budget

- Entry 127-A, Records of Property and Supply Management Branch; 1953-60R
  - Boxes 1-24, Acc. 78-1 – Nothing relevant; concerned other governmental agencies.
- Entry 149-A, General Files, War Projects, 1940-45
  - Boxes 1-41 - Nothing relevant; contained diaries, administrative reports and information regarding other installations.

RG 77, Office of the Chief of Engineers

- Entry 106B, General Correspondence, 1918-1945
  - Boxes 775-776, 803-820, 823 – Nothing relevant; pertained to general administrative matters of the Corps of Engineers.
- Entry 171, Land Papers, 1794-1916
  - Box 44 – Nothing relevant; pertained to other installations in New York.
  - Box 45 – Contained real estate-related records for Ft. Hamilton, but nothing descriptive of range areas.
  - Box 46 – Contained materials relevant to Ft. Hamilton, but nothing relevant to range areas.
- Entry 391, Construction Completion Reports
  - Boxes 113-114 – Contained materials for Ft. Hamilton, but nothing relevant to range areas.
- Entry 393, Historical Records of Buildings
  - Box 74 – Contained materials for Ft. Hamilton, but nothing relevant to range areas.
- Entry 1013, Correspondence with Districts
  - Boxes 153-161 – Contained materials for the Manhattan District Office, but nothing relevant to Ft. Hamilton.

  - Boxes 200-206 – Contained materials for the New York District Office, but nothing relevant to Ft. Hamilton.
- Entry 1014, Correspondence with Divisions
  - Boxes 20-27 – Contained materials for the Middle Atlantic Division, but nothing relevant to Ft. Hamilton.

RG 92, Office of the Quartermaster General

- Unnamed Entry
  - Boxes 3-5, 7, 14 – Nothing relevant; pertained to other installations.

RG 94, Records of the Adjutant General's Office, 1780s-1917

- Entry 464, Records of Divisions, Military Reservation Division, Early 1800s-1916
  - Box 37, 53, 61, 72 – Nothing relevant; contained information related to other installations.
  - Box 49 – COPIED materials related to firing ranges at Ft. Hamilton.

RG 107, Office of the Secretary of War

- Entry 100, Cross-Reference Sheets to General Correspondence, 1943-46
  - Box 1-2 – Nothing relevant; contained information related to other installations.
- Entry 102, Administration Assistant to the Secretary of War, 1943-46
  - Boxes 101, 112-114, 117-120, 127-133 – Nothing relevant; contained materials related to other installations.
- Entry 108, Secretary of War (Patterson), Army and Navy Munitions Board, 1946-47
  - Boxes 1-10 – Nothing relevant; contained information related to other installations.
- Entry 158, Under Secretary of War, Special Assistant for Construction, M. J. Madigan, General Correspondence, 1940-45
  - Boxes 893-898, 900-905 – Nothing relevant; contained materials regarding construction and defense plants for other installations.
  - Box 899 – COPIED Fort Hamilton map.
- Entry 159, Under Secretary of War, Special Assistant for Construction, M. J. Madigan, General Correspondence, 1940-45
  - Box 905 – Nothing relevant; contained information related to other installations.
- Entry 168, Office of Under Secretary of War, Purchase and Contract Branch Construction Section, Subject Files, 1940-42
  - Boxes 1205-1210 – Nothing relevant; contained materials regarding ordnance plants, housing and progress reports for other installations.

- Entry 216, Under Secretary of War, Special Assistant for Construction, M. J. Madigan, General Correspondence, 1940-45
    - Boxes 178-186 - Nothing relevant; contained materials related to other installations.

RG 111, Office of the Chief Signal Officer

- Entry 7, Unclassified Central Decimal Files, 1941-1957 – Archives staff could not locate.

RG 156, Office of the Chief of Ordnance

- Entry 46, Reports of Target Firings by Artillery Units, 1895-1924
    - Boxes 1-9 – Nothing relevant; information concerned other installations.
    - Boxes 10-11 – COPIED information concerning target range activities at Hamilton.
    - Boxes 12-18 – Nothing relevant; information concerned other installations.
    - Box 19 - COPIED information concerning target range activities at Hamilton.
    - Boxes 20-22 – Nothing relevant; information concerned other installations.
    - Box 23 - COPIED information concerning target range activities at Hamilton.
    - Box 24 – Nothing relevant; information concerned other installations.
    - Box 25 - COPIED information concerning target range activities at Hamilton.
    - 26-49 – Nothing relevant; information concerned other installations.

RG 159, Office of the Inspector General

- Entry 26C, General Correspondence
    - Boxes 25-35 – Nothing relevant; materials concerned other installations.
    - Box 36 – Contained information for Hamilton, but nothing relevant to range use.
    - Boxes 37-48 – Nothing relevant; materials concerned personnel matters, allotments and administrative matters.

RG 160, Headquarters Army Service Forces

- Entry 25, Directory of Plans and Operations, 1942-44
    - Boxes 1-18 – Nothing relevant; concerned administrative matters.

RG 165, War Department General and Special Staffs

- Entry 484, Legislative and Liaison Division, Legislative Branch, Correspondence and other Papers Relating to Pending Legislation Affecting the War Department, January 1843–August 1946
    - Boxes 244-265 – Nothing relevant; concerned administrative matters.

- Entry 484C, Card File of approved WPA National Defense Projects, 1942-48
    - Boxes 2-5 – Nothing relevant; contained materials for other installations.
- Entry 258, Reports and Correspondence Relating to Construction, Utilization and Disposal of Army Installations, 1944-147
    - Boxes 149-152 – Contained materials on construction in the Pacific region, but nothing related to Fort Hamilton.
- Entry 484D, Reports and Correspondence Relating to Construction, Utilization and Disposal of Army Installations, 1944-47
    - Boxes 45, 46, 69 – Nothing relevant, contained administrative files.

RG 175, Records of the Chemical Warfare Service

- Entry 1
    - Boxes 22, 220, 245-255, 541 – Nothing relevant; contained decimal files for other installations.
- Entry 1A
    - Boxes 13, 23, 382, 286-388, 390, 391, 292, 295, 298, 400, 401 - Nothing relevant; contained decimal files for other installations.
- Entry 2A
    - Boxes 1-14 – Nothing relevant; contained material for other installations.
- Entry 4
    - Boxes 1-45 - Nothing relevant; contained material for other installations.
- Entry 4A
    - Boxes 134-163 - Nothing relevant; contained material for other installations.

RG 177, Chiefs of Arms

- Entry 5, Records of the Office of the Chief of Coast Artillery, Charts, Tables and Other Records pertaining to Target Practice, 1904-35
    - Box 1 - Nothing relevant; contained information regarding other installations.
- Entry 7, Records of the Office of Chief of Coast Artillery, Drill Regulations, Coastal Artillery, n.d.
    - Box 1 - Nothing relevant; contained an operations manual
- Entry 10, Station Books for Artillery Officers, 1878-1900
    - Box 1 - Nothing relevant; contained information regarding personnel.
- Entry 11, Intelligence File, 1928-1930
    - Box 1 - Nothing relevant; contained information regarding other installations.
- Entry 13, Records of Coastal Artillery Board, Working Drawings and Charts for Use in Preparing Land Defense Plans, n.d.
    - Boxes 1-3 – Nothing relevant; contained information regarding other installations.
- Entry 14, Field Artillery Board, Decimal File, 1931-1942
    - Boxes 1-5 - Nothing relevant; materials concerned administrative matters.

- Entry 22, Outline History and Organization Data Pertaining to the Coast Artillery Corps, 1901-20
    - Box 1 - Nothing relevant; contained information regarding other installations.
- Entry 32, Coast Artillery Training Camps, 1917-19
    - Boxes 1-17 - Nothing relevant; contained information regarding personnel.

RG 319, Army Staff

- Entry 47C, Project Decimal File, 1941-45
    - Boxes 1-30 – Nothing relevant; materials concerned administrative matters.

RG 330, Records of the Department of Defense

- Entry 179
    - Boxes 1-2 – Nothing relevant; contained information for other installations.

RG 334, Inter-Service Agencies

- Entry 15, Armed Service Explosives Safety Board
    - Boxes 1-19 – Nothing relevant; pertained to reports on explosions at other installations.

RG 335, Office of the Secretary of the Army

- Entry 60, Assistant Secretary of the Army (Installations and Logistics), General Correspondence, 1963-64
    - Boxes 1-137 - Nothing relevant; contained materials for other installations.
- Entry 116, Army Installation Board, Decimal File, 1951-52
    - Boxes 1-8 - Nothing relevant; contained materials for other installations.
- Entry 118, UIC Wo4WAA, White Sands MR, 1978—81
    - Boxes 10-11 – Nothing relevant; contained materials for other installations.

RG 337, Army Ground Force HQ

- Entry 1, Inspection Reports, 1948-1950
    - Box 8 – Contained materials for Hamilton, but nothing relevant to range areas.
- Entry 30, Troop Training Division, Replacement Training Branch Inspection Reports, 1942-1944
    - Box 179 – Alphabetical organization covering Hamilton, but nothing found for that installation.
- Entry 30A, Training Reports, 1943-1947

  - Box 183 – Alphabetical organization covering Hamilton, but found nothing for that installation.

- Entry 55, General Correspondence, 1942-48
  - Boxes 677-684 – Nothing relevant; contained general information on training and target ranges and information for those activities at other installations.
  - Boxes 722-724 - Nothing relevant; contained general information on target practice and small arms ranges.
  - Boxes 1024-1046 – Nothing relevant; contained general information on various ordnance and munitions.
- Entry 55B, Classified Central Files, 1942-1954
  - Boxes 60-64 – Nothing relevant; contained general information on training exercises.
- Entry 91, Special Staff Ordnance Section – Classified Decimal Files, 1945-1948
  - Boxes 1-10 – Nothing relevant; contained information concerning budgets, strength and training status, National Guard training and ammunition types.

RG 338, U.S. Army Commands, 1942-

- Unnumbered entry
  - Box 1, Acc. 81-0051 - Nothing relevant; concerned other installations.
- Entry A1 189
  - Boxes 1495-97, 1500-01, 1584-86, 1642-44 - Nothing relevant; concerned other installations.
- Entry A1 242
  - Box 2165-66 - Nothing relevant; concerned other installations.
- Entry 71
  - Boxes 1-5 - Nothing relevant; concerned other installations.
- Entry 78-L
  - Boxes 1-2, Acc. 95-0485 - Nothing relevant; concerned other installations.
- Entry 93-118
  - Box 1, Acc. 79-0079 - Nothing relevant; concerned other installations.

- Entry 109
    - Boxes 1-6 - Nothing relevant; concerned other installations.
- Entry 118
    - Box 1-9, Acc. 86-0559 - Nothing relevant; concerned other installations.
- Entry 119
    - Boxes 1-2, Acc. 91-400 - Nothing relevant; concerned other installations.
- Entry 145
    - Box 1092 - Nothing relevant; concerned other installations.
- Entry 240
    - Boxes 2145-2155 - Nothing relevant; concerned other installations.
- Entry 241
    - Boxes 2156-64 - Nothing relevant; concerned other installations.
- Entry 330
    - Box 198 - Nothing relevant; concerned other installations.
- Entry 331
    - Box 199 - Nothing relevant; concerned other installations.
- Entry 401-25
    - Acc. 68-A-6509 - Nothing relevant; concerned other installations.
- Entry 401-46
    - Acc. 73-A-0125 - Nothing relevant; concerned other installations.
- Entry 401-53
    - Boxes 1-3, Acc. 69-A-0561 - Nothing relevant; concerned other installations.
- Entry 401-118
    - Boxes 1, 2, Acc. 69-B-5761 - Nothing relevant; concerned other installations.
- Entry 401-243
    - Box 1, Acc. 83-0591 - Nothing relevant; concerned other installations.

- Entry 401-297
    - Box 1, Acc. 78-0986 - Nothing relevant; concerned other installations.
    - Entry 401-3451
- Boxes 2-23, Acc. 68-C-389 - Nothing relevant; concerned other installations.
    - Entry 401-366
- Acc. 92-0567 - Nothing relevant; concerned other installations.
    - Entry 401-400
- Boxes 38-39, Acc. 74-F-0740 - Nothing relevant; concerned other installations.
    - Entry 401-423
- Box 1, Acc. 80-0573 - Nothing relevant; concerned other installations.
    - Entry 410-143
- Box 1-2, Acc. 69-B-0691 - Nothing relevant; concerned other installations.
    - Entry 410-144
- Boxes 5-6, Acc. 69-O-0691 - Nothing relevant; concerned other installations.
    - Entry 410-145
- Boxes 8-9, Acc. 69-F-0691 - Nothing relevant; concerned other installations.
    - Entry 410-150
- Acc. 69-A-0692 - Nothing relevant; concerned other installations.
    - Entry 410-218
- Box 1-2, Acc. 81-0044 - Nothing relevant; concerned other installations.
    - Entry 410-219
- Box 1, Acc. 81-0047 - Nothing relevant; concerned other installations.
    - Entry 410-220
- Acc. 81-0049 - Nothing relevant; concerned other installations.
    - Entry 410-221
- Box 3, 5 (4 missing), Acc. 81-0045 - Nothing relevant; concerned other installations.
    - Entry 410-223

- Acc. 81-0053 - Nothing relevant; concerned other installations.
    - Entry 410-224
- Acc. 81-0051 - Nothing relevant; concerned other installations.
    - Entry 410-225
- Box 1, Acc. 81-0052 - Nothing relevant; concerned other installations.
    - Entry 410-338
- Boxes 1-4, Acc. 74-A-A740 - Nothing relevant; concerned other installations.
    - Entry 410-338
- Box 1, Acc. 70-A-0667 - Nothing relevant; concerned other installations.
    - Entry 410-527
- Boxes 1-2, Acc. 81-0034 - Nothing relevant; concerned other installations.
    - Entry 412
- Box 503 - Nothing relevant; concerned other installations.
    - Entry 1038
- Box 23 - Nothing relevant; concerned other installations.
    - Entry 34173
- Boxes 1-2 - Nothing relevant; concerned other installations.
    - Entry 35226
- Boxes 1-10 - Nothing relevant; concerned other installations.
    - Entry 42851
- Boxes 1-4 - Nothing relevant; concerned other installations.
    - Entry 42852
- Box 1 - Nothing relevant; concerned other installations.

RG 392, U.S. Army Coast Artillery District and Defenses, 1901-42

- Reviewed finding aid, but identified nothing relevant to Hamilton.

RG 393, U.S. Army Central Command, 821-1920

- Reviewed finding aid, but identified nothing relevant to Hamilton.

RG 407, Adjutant General's Office

- Entry 360, Project Decimal File, 1940-54
  - Boxes 414, 500-513, 957-958, 961 and 995 – Nothing relevant; materials concerned training and ranges, but for other installations.
- Entry 363A, Project Decimal File, 1940-45
  - Boxes 2468-9 – Nothing relevant; materials concerned inspections at other installations
  - Boxes 2650-71 – Nothing relevant; materials concerned training, generally.
  - Box 3965 – Nothing relevant; materials concerned ranges at other installations.
  - Box 3985 – Nothing relevant; materials concerned other installations.
  - Box 4047 – Nothing relevant; materials concerned ranges at other installations.
- Entry 363B, Project Decimal File, 1946-48
  - Boxes 1132, 1223-33 and 1506 – Nothing relevant; materials concerned inspections and training exercises at other installations.
- Entry 363C, Project Decimal File, 1949-50
  - Boxes 596, 655-75, 956, 959 and 974 – Nothing relevant; materials concerned ranges at other installations.
- Entry 363D, Project Decimal File, 1951-52
  - Boxes 505, 569-88, 941, 944 and 956 - Nothing relevant; materials concerned inspections, training and ranges at other installations.
- Entry 363E, Project Decimal File, 1953-54
  - Boxes 194-98, 229-243, 356-57 and 931-32 – Nothing relevant; materials concerned investigations, training, construction and administrative matters at other installations.

RG 429, Organizations in the Executive Office of the President

- Entry 12, Central Real Property Surveys
  - Box 36 – Contained information for Hamilton, but nothing relevant to range areas.
  - Boxes 37, 42 and 88 – Nothing relevant; materials concerned other installations.

RG 546, U.S. Army Continental Command, 1945-

- Reviewed finding aid, but identified nothing relevant to this installation.

Cartographic Branch

RG 77, Office of the Chief of Engineers

- War Department Map Collection – Contained materials concerning Hamilton, but nothing relevant to range areas.
- Drawers/Sheets Series – Contained materials concerning Hamilton, but nothing relevant to range areas.

RG 92, Office of the Quartermaster General

- Blueprint File – Contained materials concerning Hamilton, but nothing relevant to range areas.

RG 94, Office of the Adjutant General's Office, 1780s-1917

- Enclosure File - Contained materials concerning Hamilton, but nothing relevant to range areas.

Still Picture Branch

RG 77, Office of the Chief of Engineers

- Reviewed finding aids for the following series, but identified nothing relevant to this installation: A, AB, CE, F. OT, SD, X.

RG 92, Office of the Quartermaster General

- Reviewed finding aids for the following series, but identified nothing relevant to this installation: CD, FL, M, MA, PS, S, UF, WC.

RG 111, Chief Signal Officer of the U.S. Army

- Series SCA, Central Photo File
  - Album 284 – Contained material for Hamilton, but nothing relevant to ranges.
  - Album 284A – COPIED relevant material for Hamilton.
- Series SC – Searched the following boxes, but found nothing relevant to this installation: 16, 269, 275, 284, 291, 305, 307, 310, 313-4, 361, 367, 379, 386, 390, 393, 396, 407.
- Series CC - Searched the following boxes, but found nothing relevant to this installation: 35-40, 44, 59, 98-99, 104, 110.

RG 319, Army Staff

- Series CF - Searched the following boxes, but found nothing relevant to this installation: 1-2, 9, 11-14.

RG 394, U.S. Army Continental Commands, 1920-42

- Entry 1
  - Box 177, 206, 222-234 – Nothing relevant; contained guidelines, plans and procedures for training.
- Entry 2
  - Box 12 – Nothing relevant; contained general correspondence.
- Entry 3
  - Box 45 – Nothing relevant; contained personnel ROTC files.
- Entry 4 – Nothing relevant; contained materials related to Squantum Airport.
- Entry 5
  - Box 420 – Nothing relevant; contained materials related to the training curricula.
- Entry 6
  - Boxes 1, 2 – Nothing relevant; concerned maneuver operations.
- Entry 8
  - Boxes 1-3 – Nothing relevant; concerned maneuver operations.
- Entry 19
  - Boxes 1-3 - Nothing relevant; concerned maneuver operations.
- Entry 20
  - Box 1-7 – Nothing relevant; concerned leases and general correspondence.
- Entry 21 – Nothing relevant; concerned ROTC training.
- Entry 24
  - Box 188 – Nothing relevant; concerned classroom training.
- Entry 25
  - Boxes 11, 12 – Nothing relevant; concerned other installations.
- Entry 29
  - Boxes 1-7 – Nothing relevant; concerned other installations.
- Entries 53, 54 – Nothing relevant; concerned personnel.
- Entry 78
  - Box 172 – Nothing relevant; concerned lectures and procedures.
- Entry 79
  - Box 300 – Nothing relevant; concerned lectures and training at foreign posts.
- Entry 80
  - Box 407 – Nothing relevant; contained a correspondence index.
- Entry 81
  - Box 3 – Nothing relevant; concerned investigations of insubordination.
- Entry 82 - Nothing relevant; concerned mobilization plans.
- Entry 83
  - Box 335 – Nothing relevant; concerned other installations.
- Entry 84
  - Box 424 – Nothing relevant; concerned other installations.
- Entry 88
  - Box 1-11 – Nothing relevant; concerned manuals, training, and use of installation correspondence.

- Entry 89
  - Boxes 1, 2 – Nothing relevant; concerned training.
- Entry 111
  - Box 1310, 1452 – Nothing relevant; contained general orders and correspondence.
- Entry 284 - Nothing relevant, concerned Courts Martial correspondence logs and administrative correspondence.
- Entry 269
  - Boxes 435, 436, 451-458 – Nothing relevant; concerned materials related to training.
- Entry 276 – Nothing relevant; concerned maneuvers.
- Entry 298
  - Box 1 A & B, 5C, 10, 13A, 22, 23, 26, 27, 42, 52 – Nothing relevant; concerned other installations.
- Entry 301 – Nothing relevant; concerned the Infantry Division and training directives.
- Entry 448 – Contained materials related to Fort Hamilton, but nothing relevant to ranges.
- Entry 449 – Nothing relevant; contained special orders.
- Entry 450 – Nothing relevant; concerned notes on personnel and competitions.
- Entry 469 – Nothing relevant; concerned other installations.
- Entry 520 – Nothing relevant; concerned other installations.
- Entry 521
  - Boxes 1-3 – Nothing relevant, concerned general and special orders.

National Archives and Records Administration – Northeast Region, New York City, NY – **48.5 hours**

RG 77, Records of the Office of the Chief of Engineers

- Unnumbered Entry, Real Estate Supervisory Files
  - Box 135323D, Acc. 72A1488 – Nothing relevant; concerned surplus wharf information.
- Unnumbered Entry, Military Construction Administration Files
  - Boxes 93116B, Box 933117B, Box 933120B, Acc. 71A155 – Nothing relevant; concerned personnel, construction, contracts and guidelines.
- Unnamed Entry
  - Boxes 596344, 596362, Acc. 62A505 – Nothing relevant, concerned housing, property agreements, acquisitions and disposal.
- Entry 802, District Engineer Office, New York City, Fort Hamilton 1907-1930
  - Box 26-29 – Nothing relevant; concerned property improvements and repairs correspondence.
- Entry 806
  - Boxes 54-57 – Contained material related to Ft. Hamilton; but nothing related to range areas.
- Entry 807

  - Box 50 – Contained material related to Ft. Hamilton; but nothing relevant to range areas.
- Entry 810, Northeast Region, Press Copies, Letters Sent Regarding Fort Hamilton, 1866-1906
  - Volumes 1–7 – Nothing relevant; contained acknowledgment letters, supply requests and financial correspondence.
  - Volume 5–9 - COPIED letter in Volume 6 regarding target butt location.
- Entry 811, Northeast Region, Letters and Reports Sent Relating to Fort Hamilton 1866-1906
  - Volume 1, May 2, 1894–July 29, 1896 - COPIED letters related to target practice at Fort Hamilton.
- Entry 812, Press Copies of Letters Sent Relating to Construction of a Counterpoise Battery at Fort Hamilton, March 22, 1889-March 17, 1892
  - Not relevant; concerned operations reports and board proceedings on construction.
- Entry 826, Letters Received from Engineer Department, Washington Relating to Fort Hamilton and its Gun Batteries, February 20, 1862 – Dec. 21, 1870
  - Not relevant, concerned correspondence related to land and construction.
- Entry 827 Letters Sent Fort Hamilton Batteries, March 2, 1867-Dec. 17, 1874
  - 1 volume: operations correspondence
- Entry 828 Fort Hamilton Gun and Mortar Batteries July 23, 1892 – August 21, 1896
  - 1 volume: register of letters (brief descriptions of letters received)
- Entry 829, New York City District Office, Letters Received
  - Boxes 26-28 – Materials related to Fort Hamilton; but nothing relevant to ranges.
  - Box 30-33 – Nothing relevant; contained materials related to other installations.

RG269/270, Real Property Disposal Files

- Review of finding aid revealed nothing related to Ft. Hamilton.

RG338, Records of U.S. Army Operational, Tactical and Support Organizations (WW II and Thereafter)

- General management files for Ft. Hamilton, but nothing related to range areas.

RG 392, Records of the U.S. Army Coast Artillery Districts and Defenses, 1901-1942

- Entry 221 Harbor Defenses of New York, 1901-1942
  - Contained material related to Ft. Hamilton; but nothing related to range areas.

Military History Institute, Carlisle Barracks, PA – **2 hours**

The following concern only materials in the Institute's library. Heritage reviewed the catalog extensively for other materials, also.

- Bretz, Benjamin P. Collection – COPIED a map of Ft. Hamilton.
- *U.S. Army Training and Doctrine Command – TRADOC Installation Guides, 1988* – COPIED history and maps for Ft. Hamilton.

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EXHIBIT A

WEB SEARCH

The following web sources were checked for information regarding Fort Hamilton history, in accordance with guidance provided by the Interstate Technology & Regulatory Council.

Department of Defense Information Sources

- Air Force Historical Research Agency, Maxwell Air Force Base, AL https://www.aupress.au.af.mil/SASS_Theses/SAASS_Out/Cox/cox.pdf
- Ammunition and Explosives Safety Standards https://www.army.mil/usapa/epubs/pdf/p385_64.pdf
- Defense Ammunition Center https://www3.dac.army.mil/
- Defense Environmental Network & Information Exchange https://www.denix.osd.mil/
- Defense Environmental Restoration Program—Formerly Used Defense Sites (DERP-FUDS) http://www.lrb.usace.army.mil/derpfuds/
- Defense Supply Center Richmond, Richmond, VA http://www.dscr.dla.mil/
- Defense Technical Information Center http://www.hamilton.army.mil/
- Defense Visual Information Center http://www.dodmedia.osd.mil/DVIC_View/Still_Search.cfm
- Department of Defense Ammunition and Explosives Hazard Classification Procedure http://www.ddesb.pentagon.mil/HazardClass/TB700%20Review%20Draft.pdf
- Department of Defense Contractor's Safety Requirements for Ammunition and Explosives. April 9, 2005 http://www.dtic.mil/whs/directives/corres/pdf/i414526_040905/i414526p.pdf
- Department of Defense Directive http://dtic.mil/whs/directives/corres/pdf/d60559_081905/d60889p.pdf
- Department of Defense Explosives Safety Board (DDESB) http://www.ddesb.pentagon.mil/ https://intranet.nossa.navsea.navy.mil/security/logon/logon.asp?ToPage=../..default.asp
    - Technical Papers http://www.ddesb.pentagon.mil/techpapers.html
        - TB-12 Fragments and Debris Hazard http://www.secureweb.hqda.pentagon.mil/ddesb/
        - TB-13 Prediction of Building Debris for Quantity-Distance Siting http://www.ddesb.pentagon.mil/tp13.pdf
        - TB-14 Methods and Algorithms Used in the SAFER Model. September 2003 http://www.ddesb.pentagon.mil/TP14.pdf
        - TB-15 Approved Protective Construction http://www.ddesb.pentagon.mil/TP1%2015/TP%2015.htm
        - TB-16 Methodologies for Calculation Primary Fragment Characteristics

  - TB-17 DDESB Blast Effects Computer Version 6 User's Manual and Documentation http://www.secureweb.hqda.pentagon.mil/ddesb/
  - TB-18 Minimum Qualifications for Unexploded Ordnance Technicians and Personnel http://www.ddesb.pentagon.mil/TP18_122004.pdf

- Department of Defense Explosives Safety Board (DDESB) Hazard Classification
  http://www.ddesb.pentagon.mil/HazardClass/hazclass.htm
  http://www.ddesb.pentagon.mil/HazardClass/hcprocedures.htm
  http://www.ddesb.pentagon.mil/HazardClass/HCShippingName.pdf
  http://www.ddesb.pentagon.mil/HazardClass/coalition.pdf
  http://www.ddesb.pentagon.mil/HazardClass/Competent.pdf
  http://www.ddesb.pentagon.mil/HazardClass/technical_name.pdf
  http://www.ddesb.pentagon.mil/HazardClass/rocketmotoralternatetests.pdf
  http://www.ddesb.pentagon.mil/HazardClass/ChgstoSeries6.pdf
  http://www.ddesb.pentagon.mil/HazardClass/HCchgs.pdf
  http://www.ddesb.pentagon.mil/HazardClass/25Jan00.pdf
  http://www.ddesb.pentagon.mil/HazardClass/Criteria.pdf
  http://www.ddesb.pentagon.mil/HazardClass/Analogy.pdf
  http://www.ddesb.pentagon.mil/HazardClass/28Jan99.pdf
  http://www.ddesb.pentagon.mil/HazardClass/27Jan99.pdf
  http://www.ddesb.pentagon.mil/HazardClass/26Jan99.pdf
  http://www.ddesb.pentagon.mil/HazardClass/20Jul98.pdf
  http://www.ddesb.pentagon.mil/HazardClass/27Jun98.pdf
  http://www.ddesb.pentagon.mil/HazardClass/interimhc.htm
- Department of Defense Publications Archive www.defenselink.mil/pubs/archive.html
- Explosives ordnance disposal detachments at nearby military facilities
  http://www.hackworth.com/links.html
  http://www.army.mil/cmh/books/DAHSUM/1970.chII.htm
  http://www.173rdairborne.com/Bases.htm http://www.nad/usace.army.mil/fh.htm
- Explosives Safety Standards, October 18, 2001 http://www.e-publishing.af.mil/pubfiles/af/91/afman91/-201/afman91-201.pdf
- Explosives Safety Submissions for Removal of Ordnance and Explosives from Real Property. January (Feb) 1998
  http://www.ddesb.pentagon.mil/guidanceForclearancePlans27Jan(Feb)98.pdf
- Federal Register Notices of Change for DoD 6055.9-STD
  http://www.ddesb.pentagon.mil/documents.html
  http://www.ddesb.pentagon.mil/fed%20reg%20Notice%2023%20Mar%2098.pdf
- National Imagery and Mapping Agency, Bethesda, MD http://www.nima.mil/
- Naval Construction Battalion Centers, Port Hueneme, CA
  http://www.ncbc.navfac.navy.mil/
- Naval Facilities Historian's Office, Port Hueneme, CA
  http://www.ncbc.navfac.navy.mil/cecmuseum/historian.htm

- Naval Historical Center, Washington, DC http://www.history.navy.mil/
  http://www.history.navy.mil/library/online/readingroom.htm
  http://www.history.navy.mil/cannons/cannons.html
  http://www.history.navy.mil/library/online/bombing_tool.htm
  http://www.history.navy.mil/library/online/onipubno14.htm
  http://www.history.navy.mil/cgi-bin/htsearch
  http://www.history.navy.mil/ar/alfa/asnie.htm
  http://www.history.navy.mil/branches/org12-7k.htm
- Structures to Resist the Effects of Accidental Explosions. Nov. 1990.
  http://www.ddesb.pentagon.mil/TM%205-1300,%20November%201990.pdf
- U.S. Air Force Safety Center, Kirtland AFB, NM http://afsafety.af.mil/
- U.S. Army Center for Health Promotion of Preventive Medicine, Aberdeen Proving Ground, MD http://chppm-www.apgea.army.mil/hra/human.html
- U.S. Army Center of Military History, Fort McNair, Washington, DC
  http://www.atsdr.cdc.gov/HAC/PHA/ftdevenssudbury/sta_p3.html
- U.S. Army Explosives Safety Program Document
  http://www.army.mil/usapa/epubs/pdf/r385_64.pdf
- U.S. Army Soldier and Biological Chemical Command
  http://www.sbccom.army.mil/about/sbccom.htm
- U. S. Army Corps of Engineers District Offices http://www.usace.army.mil/where.html
- U. S. Army Corps of Engineers Office of History, Alexandria, VA
  http://www.hq.usace.army.mil/history/
- U.S. Army Corps of Engineers Topographic Engineering Center (TEC), Alexandria, VA http://www.tec.army.mil/index.cfm?SearchString=hamilton
- U.S. Army Military History Institute, Carlisle, PA http://carlisle-www.army.mil/usamhi/
- U.S. Army Safety Center, Fort Rucker, AL http://safety.army.mil/home.html
- U. S. Army Technical Center for Explosives Safety, McAlester, OK
  http://www.dac.army.mil/web_access.html
- U.S. Army Technical Escort Unit Historical Office, Aberdeen Proving Ground, MD
- U.S. Army Test and Evaluation Command http://www.atec.army.mil/
- U.S. Army War College Library, Carlisle Barracks, PA http://carlisle-www.army.mil/library/
- U.S. Naval District, Washington, DC http://www.ndw.navy.mil/
- U.S. Naval Explosive Ordnance Disposal Technology Division, Indian Head, MD
  https://naveodtechdiv.navsea.navy.mil/
- U.S. Naval War College Archives, Newport, RI http://www.nwc.navy.mil/default.htm

- U.S. Navy Safety Center, Naval Air Station, Norfolk, VA
  http://www.safetycenter.navy.mil/
- Questionnaires for Explosives Effects Software
  http://www.ddesb.pentagon.mil/Questionnaire%20for%20Developers%20of%20Explosion%20Effects%20Software.pdf
  http://www.ddesb.pentagon.mil/EXPLOSION%20EFFECTS%20SOFTWARE%20QUESTIONAIRRE.doc
  http://www.ddesb.pentagon.mil/EES%20User%20Survey_July%202004.doc

Other Federal Government Information Sources

- Department of the Interior Bureau of Land Management http://www.blm.gov/
- Department of the Interior, U.S. Geological Survey (USGS) http://www.usgs.gov/
- Federal Geographic Data Committee (geographic information systems)
  http://www.fgdc.gov/
- General Services Administration http://www.gsa.gov/
- The Library of Congress, Geography and Map, and Prints and Photographs Divisions, Washington, DC http://www.loc.gov/
- U.S. EPA Environmental Photographic Interpretation Center (EPIC)
  http://www.epa.gov/nerlesd1/land-sci/epic/default.htm
- U.S. National Registry of Surviving Civil War Artillery http://www.cwartillery.org/ws-ham.html
- U.S. National Archives and Records Administration (NARA) http://www.archives.gov/

State and Local Information Sources

New York State Military Museum
http://www.dmna.state.ny.us/forts/fortsE_L/hamiltonFort.htm

EXHIBIT B

CONTACT/INTERVIEW REPORTS

CONTACT/INTERVIEW REPORT

Date: 09/01/2006 Originator: Rosa Gwinn

Contact by: Telephone _X_ Meeting ____ Other _____

Site: Fort Hamilton

Name, Title, and Organization: Mr. Heasley, Curator, Army Ordnance Museum, Aberdeen Proving Ground, Aberdeen, Maryland

Address and Telephone Number: 410-278-3602

Summary: Mr. Heasley provided information regarding the likely training activities at Coastal Defense Installations. Although he is not personally familiar with Fort Hamilton, he mentioned that standard training procedures for artillery would have included loading, siting, and firing training exercises. The accuracy of siting (i.e., setting a pieces angle and azimuth) would necessarily require the use of a projectile, although typically steel cannon balls or concrete filled projectiles would be adequate. He also mentioned that training exercises within a battery could also include loading procedures that did not require firing. He directed URS to two publications by the Coastal Defense Study Group that may contain more detailed information regarding firing practices. (The author of these documents runs a web page, which was visited by URS for supporting information.)

CONTACT/INTERVIEW REPORT

Date: 10/09/2006 Originator: Rosa Gwinn

Contact by: Telephone _X_ Meeting ____ Other _____

Site: Fort Hamilton

Name, Title, and Organization: Tom Hoffman, Park Historian, Gateway National Park, Sandy Hook, NJ

Address and Telephone Number: 732-872-5950

Summary: Mr. Hoffman was contacted because URS desired information regarding artillery training at Fort Hancock as an analogue for Fort Hamilton.

Hoffman stated that artillery practice was annual in 1930s:

- Usually in May/June.
- Notice in the form of posters was given to residents prior to training to observe safety precautions, such as:
  - Remove china from shelves.
  - Open windows/doors.
- Local population during that time was largely beach tourists vacationing at 'tourist houses' (similar to a bed and breakfast inn).

Training involved a pyramidal structure towed in water on about 300- to 400-yd cable. Pyramid was wooden frame with red/orange fabric covering. Practice objective was to get close to, not actually hit, the target as it would be destroyed for future practice.

Hoffman recalls hearing that troops from Hamilton trained at Hancock annually; plans to check fort diary.

Enlisted men arrived at Whitehall Street (NYC) and were taken by boat to their assigned station.

The permanent garrison at Hancock was built in 1898-1899.

In 1948 two 6-inch pedestal mounted guns were replaced due to worn out rifling. These guns had been at Battery Peck until 1903 then moved to Battery Gunnison. The replacement guns were from Battery Livingston at Fort Hamilton.

Appendix B: Archive Documents

(Provided on Enclosed Compact Disk)

Appendix C: MRSPP Scoring Summary

(Complete Scoring Sheets also available on CD)

Summary of MRSPP
Fort Hamilton, NY

Site	*Module Priority Scores*			Overall Priority
	Explosive Hazard Evaluation	***Chemical Hazard Evaluation***	***Human Hazard Evaluation***	
Hamilton Closed Complex: Batteries (FTHM-001-R-01)	No Known or Suspected Explosive Hazard	No Known or Suspected CWM Hazard	No Known or Suspected MC Hazard	No Known or Suspected Hazard

The MRSPP presented is considered interim until pending stakeholder input.

Table A

MRS Background Information

DIRECTIONS: Record the background information below for the MRS to be evaluated. Much of this information is available from Service and DoD databases. If the MRS is located on a FUDS property, the suitable FUDS property information should be substituted. In the **MRS Summary**, briefly describe the UXO, DMM, or MC that are known or suspected to be present, the exposure setting (the MRS's physical environment), any other incidental nonmunitions-related contaminants (e.g., benzene, trichloroethylene) found at the MRS, and any potentially exposed human and ecological receptors. If possible, include a map of the MRS.

Munitions Response Site Name:	**Fort Hamilton Closed Complex (FTHM-001-R-01)**
Component:	US Army
Installation/Property Name:	**Fort Hamilton**
Location (City, County, State):	Brooklyn, Kings County, New York
Site Name/Project Name (Project No.):	Fort Hamilton/MMRP SI (GS-10F-0105K)
Date Information Entered/Updated:	31-Oct-2007
Point of Contact (Name/Phone):	Rosa Gwinn & Sarah Gettier/URS Group, Inc. 301.721.2299

Project Phase ("X" only one):										
	PA	**X**	**SI**		**RI**		**FS**		**RD**	
	RA-C		**RIP**		**RA-O**		**RC**		**LTM**	

Media Evaluated ("X" all that apply):					
	Groundwater		**Sediment (human receptor)**		
X	**Surface soil**		**Surface water (ecological receptor)**		
	Sediment (ecological receptor)		**Surface water (human receptor)**		

MRS Summary:

MRS Description: Describe the munitions-related activities that occurred at the installation, the dates of operation, and the UXO, DMM, or MC known or suspected to be present. When possible, identify munitions, CWM, and MC by type:

The Fort Hamilton Closed Complex is the land area within the footprint of the former gun batteries and their firing fans. Gun batteries were installed here as early as 1825, and maintained through early WWII. There is no record of firing of live projectiles from any of the various guns at the batteries, although firing of inert rounds as part of training is known to have occurred until the 1920s. There is very low expectation for MC at the site, as it has been heavily modified through regrading, development, and modernization. The batteries no longer exist, and the area of the former batteries and range have been altered to depths of at least 2 feet throughout.

Description of Pathways for Human and Ecological Receptors:

All exposure pathways require a source, a pathway, and a receptor. There is no source in the form of MEC or MC, therefore, there is no exposure pathway.

Description of Receptors (Human and Ecological):

All exposure pathways require a source, a pathway, and a receptor. There is no source in the form of MEC or MC, therefore, there is no receptor.

Table 1
EHE Module: Munitions Type Data Element Table

DIRECTIONS: Below are 11 classifications of munitions and their descriptions. Annotate the score(s) that correspond with **all** munitions types known or suspected to be present at the MRS.

Note: The terms *practice munitions* , *small arms ammunition* , *physical evidence* , and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Possible Score	Score
Sensitive	♦ UXO that are considered most likely to function upon any interaction with exposed persons (e.g., submunitions, 40mm high-explosive [HE] grenades, white phosphorous [WP] munitions, high-explosive antitank [HEAT] munitions, and practice munitions with sensitive fuzes, but excluding all other practice munitions). ♦ Hand grenades containing energetic filler. ♦ Bulk primary explosives, or mixtures of these with environmental media, such that the mixture poses an explosive hazard.	30	
High explosive (used or damaged)	♦ UXO containing a high-explosive filler (e.g., RDX, Composition B), that are not considered "sensitive." ♦ DMM containing a high-explosive filler that have: ■ Been damaged by burning or detonation ■ Deteriorated to the point of instability.	25	
Pyrotechnic (used or damaged)	♦ UXO containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades). ♦ DMM containing pyrotechnic fillers other than white phosphorous (e.g., flares, signals, simulators, smoke grenades) that have: ■ Been damaged by burning or detonation ■ Deteriorated to the point of instability.	20	
High explosive (unused)	♦ DMM containing a high-explosive filler that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	15	
Propellant	♦ UXO containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ♦ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor) that are: ■ Damaged by burning or detonation ■ Dteriorated to the point of instability.	15	
Bulk secondary high explosives, pyrotechnics, or propellant	♦ DMM containing mostly single-, double-, or triple-based propellant, or composite propellants (e.g., a rocket motor). ♦ DMM that are bulk secondary high explosives, pyrotechnic compositions, or propellant (not contained in a munition), or mixtures of these with environmental media such that the mixture poses an explosive hazard.	10	
Pyrotechnic (not used or damaged)	♦ DMM containing a pyrotechnic filler (i.e. red phosphorous), other than white phosphorous filler, that have not been damaged by burning or detonation, or are not deteriorated to the point of instability.	10	
Practice	♦ UXO that are practice munitions that are not associated with a sensitive fuze. ♦ DMM that are practice munitions that are not associated with a sensitive fuze and that have not: ■ Been damaged by burning or detonation ■ Deteriorated to the point of instability.	5	
Riot control	♦ UXO or DMM containing a riot control agent filler (e.g., tear gas).	3	
Small arms	♦ Used munitions or DMM that are categorized as small arms ammunition [Physical evidence or historical evidence that no other types of munitions [e.g., grenades, subcaliber training rockets, demolition charges] were used or are present on the MRS is required for selection of this category.].	2	
Evidence of no munitions	♦ Following investigation of the MRS, there is physical evidence that there are no UXO or DMM present, or there is historical evidence indicating that no UXO or DMM are present.	0	0
MUNITIONS TYPE	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***Munitions Type*** classifications in the space provided.

Firing records show that only inert cannonballs (i.e., neither fuzed or explosive) were fired (SI Report - page 4-9).

Tables 2-9 are intentionally omitted according to Active-Army Guidance

Table 10

Determining the EHE Module Rating

DIRECTIONS:

1. From Tables 01 - 09, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **EHE Module Total** box below.

4. Circle the appropriate range for the **EHE Module Total** below.

5. Circle the **EHE Module Rating** that corresponds to the range selected and record this value in the **EHE Module Rating** box found at the bottom of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

	Source	Score	Value
Explosive Hazard Factor Data Elements			
Munitions Type	Table 1	0	0
Source of Hazard	Table 2	0	
Accessibility Factor Data Elements			
Location of Munitions	Table 3	0	0
Ease of Access	Table 4	0	
Status of Property	Table 5	0	
Receptor Factor Data Elements			
Population Density	Table 6	0	0
Population Near Hazard	Table 7	0	
Types of Activities/Structures	Table 8	0	
Ecological and/or Cultural Resources	Table 9	0	
EHE MODULE TOTAL			**0**

EHE Module Total	EHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected Explosive Hazard
EHE MODULE RATING	**No Known or Suspected Explosive Hazard**

Table 11

CHE Module: CWM Configuration Data Element Table

DIRECTIONS: Below are seven classifications of CWM configuration and their descriptions. Annotate the score(s) that correspond to **all** CWM configurations known or suspected to be present at the MRS.

Note: The terms *CWM/UXO*, *CWM/DMM*, *physical evidence*, and *historical evidence* are defined in Appendix C of the Primer.

Classification	Description	Possible Score	Score
CWM, that are either UXO, or explosively configured, damaged DMM	The CWM known or suspected of being present at the MRS are: ♦ CWM that are UXO (i.e. CWM/UXO) ♦ Explosively configured CWM that are DMM (i.e. CWM/DMM) that have been damaged.	30	
CWM mixed with UXO	♦ The CWM known or suspected of being present at the MRS are undamaged CWM/DMM or CWM not configured as a munition that are commingled with conventional munitions that are UXO.	25	
CWM, explosive configuration that are undamaged DMM	♦ The CWM known or suspected of being present at the MRS are explosively configured CWM/DMM that have not been damaged.	20	
CWM/DMM, not explosively configured or CWM, bulk container	The CWM known or suspected of being present at the MRS are: ♦ Nonexplosively configured CWM/DMM either damaged or undamaged ♦ Bulk CWM (e.g., ton container).	15	
CAIS K941 and CAIS K942	♦ The CWM/DMM known or suspected of being present at the MRS is CAIS K941-toxic gas set M-1 or CAIS K942-toxic gas set M-2/E11.	12	
CAIS (chemical agent identification sets)	♦ CAIS, other than CAIS K941 and K942, are known or suspected of being present at the MRS.	10	
Evidence of no CWM	♦ Following investigation, the physical evidence indicates that CWM are not present at the MRS, or the historical evidence indicates that CWM are not present at the MRS.	0	0
CWM CONFIGURATION	**DIRECTIONS:** Record **the single highest score** from above in the box to the right (maximum score = 30).		**0**

DIRECTIONS: Document any MRS-specific data used in selecting the ***CWM Configuration*** classifications in the space provided.

CWM was not used at Fort Hamilton.

Tables 12-19 are intentionally omitted according to Active-Army Guidance

Table 20

Determining the CHE Module Rating

DIRECTIONS:

1. From Tables 11 - 19, record the data element scores in the **Score** boxes to the right.

2. Add the **Score** boxes for each of the three factors and record this number in the **Value** boxes to the right.

3. Add the three **Value** boxes and record this number in the **CHE Module Total** box below.

	Source	Score	Value
CWM Hazard Factor Data Elements			
CWM Configuration	Table 11	0	0
Sources of CWM	Table 12	0	
Accessibility Factor Data Elements			
Location of CWM	Table 13	0	0
Ease of Access	Table 14	0	
Status of Property	Table 15	0	
Receptor Factor Data Elements			
Population Density	Table 16	0	0
Population Near Hazard	Table 17	0	
Types of Activities/Structures	Table 18	0	
Ecological and/or Cultural Resources	Table 19	0	
CHE MODULE TOTAL			**0**

4. Circle the appropriate range for the **CHE Module Total** below.

5. Circle the **CHE Module Rating** that corresponds to the range selected and record this value in the **CHE Module Rating** box found at the bottom of this table.

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more data elements, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

CHE Module Total	CHE Module Rating
92 to 100	A
82 to 91	B
71 to 81	C
60 to 70	D
48 to 59	E
38 to 47	F
less than 38	G
Alternative Module Ratings	Evaluation Pending
	No Longer Required
	No Known or Suspected CWM Hazard
CHE MODULE RATING	**No Known or Suspected CWM Hazard**

Table 21

HHE Module: Groundwater Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's groundwater and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional groundwater contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the groundwater, select the box at the bottom of the table.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	

CHF Scale	CHF Value	Sum the Ratios
CHF > 100	H (High)	CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Annotate the value that corresponds most closely to the groundwater migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the groundwater is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in groundwater has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the groundwater to a potential point of exposure (possibly due to geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Annotate the value that corresponds most closely to the groundwater receptors at the MRS.

Classification	Description	Value
Identified	There is a threatened water supply well downgradient of the source and the groundwater is a current source of drinking water or source of water for other beneficial uses such as irrigation/agriculture (equivalent to Class I or IIA aquifer).	H
Potential	There is no threatened water supply well downgradient of the source and the groundwater is currently or potentially usable for drinking water, irrigation, or agriculture (equivalent to Class I, IIA, or IIB aquifer).	M
Limited	There is no potentially threatened water supply well downgradient of the source and the groundwater is not considered a potential source of drinking water and is of limited beneficial use (equivalent to Class IIIA or IIIB aquifer, or where perched aquifer exists only).	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
	Place an "X" in the box to the right if there is no known or suspected Groundwater MC Hazard	**X**

Table 22

HHE Module: Surface Water - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard with human endpoints present in the surface water, select the box at the bottom of the table.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value	
CHF > 100	H (High)	CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L

MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L

RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Human Endpoint) MC Hazard	**X**

Table 23

HHE Module: Sediment - Human Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for human endpoints present in the sediment, select the box at the bottom of the table.

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**		
100 > CHF >2	**M (Medium)**	**CHF = ∑ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])**	
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Annotate the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Annotate the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Sediment (Human Endpoint) MC Hazard		**X**

Table 24

HHE Module: Surface Water - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface water and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface water contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the surface water, select the box at the bottom of the table.

Note: Use either dissolved or total metals analyses.

Contaminant [CAS No.]	Maximum Concentration (µg/L)	Comparison Value (µg/L)	Ratios
		Total from Table 27	
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**		
100 > CHF >2	**M (Medium)**	**CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])**	
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Annotate the value that corresponds most closely to the surface water migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface water is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface water has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface water to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Annotate the value that corresponds most closely to the surface water receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface water to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface water to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface water to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Place an "X" in the box to the right if there is no known or suspected Surface Water (Ecological Endpoint) MC Hazard	**X**

Table 25

HHE Module: Sediment - Ecological Endpoint Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's sediment and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the **ratios** together, including any additional sediment contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard for ecological endpoints present in the sediment, select the box at the bottom of the table.

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
CHF Scale	**CHF Value**	**Sum the Ratios**	
CHF > 100	**H (High)**		
100 > CHF >2	**M (Medium)**	**CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])**	
2 > CHF	**L (Low)**		
CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).		

Migratory Pathway Factor

DIRECTIONS: Annotate the value that corresponds most closely to the sediment migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the sediment is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in sediment has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the sediment to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Annotate the value that corresponds most closely to the sediment receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to sediment to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to sediment to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to sediment to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Sediment (Ecological Endpoint) MC Hazard		**X**

Table 26

HHE Module: Surface Soil - Data Element Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Record the **maximum concentrations** of all contaminants in the MRS's surface soil and their **comparison values** (from Appendix B of the Primer) in the table below. Additional contaminants can be recorded on Table 27. Calculate and record the **ratios** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** by adding the contaminant **ratios** together, including any additional surface soil contaminants recorded on Table 27. Based on the **CHF**, use the **CHF Scale** to determine and record the **CHF Value**. If there is no known or suspected MC hazard present in the surface soil, select the box at the bottom of the table.

Contaminant [CAS No.]	Maximum Concentration (mg/kg)	Comparison Value (mg/kg)	Ratios
		Total from Table 27	
		Sum the Ratios	

CHF Scale	CHF Value	
CHF > 100	H (High)	CHF = $\sum$ ([Max Conc of Contaminant] / [Comparison Value for Contaminant])
100 > CHF >2	M (Medium)	
2 > CHF	L (Low)	

CONTAMINANT HAZARD FACTOR	Directions: Record **the CHF Value** from above in the box to the right (maximum value = H).	

Migratory Pathway Factor

DIRECTIONS: Annotate the value that corresponds most closely to the surface soil migratory pathway at the MRS.

Classification	Description	Value
Evident	Analytical data or observable evidence indicates that contamination in the surface soil is present at, moving toward, or has moved to a point of exposure.	H
Potential	Contamination in surface soil has moved only slightly beyond the source (i.e. tens of feet), could move but is not moving appreciably, or information is not sufficient to make a determination of Evident or Confined.	M
Confined	Information indicates a low potential for contaminant migration from the source via the surface soil to a potential point of exposure (possibly due to presence of geological structures or physical controls).	L
MIGRATORY PATHWAY FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	

Receptor Factor

DIRECTIONS: Annotate the value that corresponds most closely to the surface soil receptors at the MRS.

Classification	Description	Value
Identified	Identified receptors have access to surface soil to which contamination has moved or can move.	H
Potential	Potential for receptors to have access to surface soil to which contamination has moved or can move.	M
Limited	Little or no potential for receptors to have access to surface soil to which contamination has moved or can move.	L
RECEPTOR FACTOR	Directions: Record **the single highest value** from above in the box to the right (maximum value = H).	
Place an "X" in the box to the right if there is no known or suspected Surface Soil MC Hazard		**X**

Table 27

HHE Module: Supplemental Contaminant Hazard Factor Table

Contaminant Hazard Factor (CHF)

DIRECTIONS: Only use this table if there are more than five contaminants in any given medium present at the MRS. This is a supplemental table designed to hold information about contaminants that do not fit in the previous tables. Indicate the **media** in which these contaminants are present. Then record all **contaminants**, their **maximum concentrations** and their **comparison values** (from Appendix B of the Primer) in the table below. Calculate and record the **ratio** for each contaminant by dividing the **maximum concentration** by the **comparison value**. Determine the **CHF** for each medium on the appropriate media-specific tables.

Note: Do not to add ratios from different media.

Media	Contaminant [CAS No.]	Maximum Concentration	Units	Comparison Value	Units	Ratios
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
Surface soil			mg/kg		mg/kg	
				SUBTOTAL FOR SURFACE SOIL		0
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
Sediment			mg/kg		mg/kg	
				SUBTOTAL FOR SEDIMENT		0
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
Surface water			µg/L		µg/L	
				SUBTOTAL FOR SURFACE WATER		0
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
Groundwater			µg/L		µg/L	
				SUBTOTAL FOR GROUNDWATER		0

Table 28

Determining the HHE Module Rating

DIRECTIONS:

1. Record the letter values (H, M, L) for the **Contaminant Hazard**, **Migration Pathway**, and **Receptor Factors** for the media (from Tables 21 - 26) in the corresponding boxes below.
2. Record the media's three-letter combinations in the **Three-Letter-Combination** boxes below (three-letter combinations are arranged from Hs to Ms to Ls).
3. Using the HHE ratings provided below, determine each medium's rating (A - G) and record the letter in the corresponding **Media Rating** box below.

Medium (Source)	Contaminant Hazard Factor Value	Migratory Pathway Factor Value	Receptor Factor Value	Three-Letter Combination (Hs-Ms-Ls)	Media Rating (A - G)
Table 21 - Groundwater					
Table 22 - Surface Water (Human Endpoint)					
Table 23 - Sediment (Human Endpoint)					
Table 24 - Surface Water (Ecological Endpoint)					
Table 25 - Sediment (Ecological Endpoint)					
Table 26 - Surface Soil					
			HHE MODULE RATING		**No Known or Suspected MC Hazard**

DIRECTIONS (Continued):

4. Select the single highest **Media Rating** (A is the highest; G is the lowest) and enter the letter in the **HHE Module Rating** box below.

HHE Ratings (for reference only)	
HHH	A
HHM	B
HHL	C
HMM	
HML	D
MMM	
HLL	E
MML	
MLL	F
LLL	G

NOTE: An alternative module rating may be assigned when a module letter rating is inappropriate. An alternative module rating is used when more information is needed to score one or more media, contamination at an MRS was previously addressed, or there is no reason to suspect contamination was ever present at an MRS.

Alternative Module Ratings
Evaluation Pending
No Longer Required
No Known or Suspected MC Hazard

Table 29

MRS Priority

DIRECTIONS: In the chart below, enter the letter **rating** for each module recorded in Table 10 (EHE), Table 20 (CHE), and Table 28 (HHE). Enter the corresponding numerical **priority** for each module. If information to determine the module rating is not available, choose the appropriate alternative module rating. The MRS priority is the single highest priority; record this relative priority in the **MRS Priority or Alternative MRS Rating** at the bottom of the table.

NOTE: An MRS assigned Priority 1 has the highest relative priority; an MRS assigned Priority 8 has the lowest relative priority. Only an MRS with CWM known or suspected to be present can be assigned Priority 1; an MRS that has CWM known or suspected to be present cannot be assigned Priority 8.

EHE Rating	Priority	CHE Rating	Priority	HHE Rating	Priority
		A	1		
A	2	B	2	A	2
B	3	C	3	B	3
C	4	D	4	C	4
D	5	E	5	D	5
E	6	F	6	E	6
F	7	G	7	F	7
G	8			G	8
Evaluation Pending		Evaluation Pending		Evaluation Pending	
No Longer Required		No Longer Required		No Longer Required	
No Known or Suspected Explosive Hazard		No Known or Suspected CWM Hazard		No Known or Suspected MC Hazard	

Reference Table 10:		Reference Table 20:		Reference Table 28:	
EHE Module Rating	**Priority**	**CHE Module Rating**	**Priority**	**HHE Module Rating**	**Priority**
No Known or Suspected Explosive Hazard	No Known or Suspected Explosive Hazard	No Known or Suspected CWM Hazard	No Known or Suspected CWM Hazard	No Known or Suspected MC Hazard	No Known or Suspected MC Hazard

MRS Priority or Alternative MRS Rating	No Longer Required No known or suspected hazard

Appendix D: TPP Meeting Minutes

URS

MEETING MINUTES

PURPOSE: Technical Project Planning (TPP) 2 Meeting, Fort Hamilton, NY
Military Munitions Response Program Site Inspection (MMRP SI)

LOCATION: Building 129, Fort Hamilton

DATE: 7 February 2007

TIME: 0930 – 1130

Attendees	Organization	Phone	E-mail
George Kiernan	Fort Hamilton Environmental	718-630-4489	george.kiernan@us.army.mil
Tim Peck	USACE-Baltimore	410-962-3416	timothy.j.peck@usace.army.mil
Dan Eaton	NYDEC	518-402-9620	djeaton@gw.dec.state.ny.us
Rosa Gwinn	URS	301-258-5817	rosa_gwinn@urscorp.com

I. Introduction of meeting attendees

II. Presentation

- Reviewed primary and secondary MMRP SI goals.
  - The primary goal is to determine whether a Munitions Response Site (MRS) will require an RI/FS, an Interim Response, or No Further Action.
  - At Fort Hamilton, there is only one MRS and data support a No Further Action decision.
  - The secondary goals are improving cost to complete estimates and collecting data sufficient for scoring the MRS on the Prioritization Protocol (MRSPP).

- Reviewed MMRP Policy.
  - Emphasized the involvement of stakeholders.

- Reviewed the TPP Process.
  - The kick-off was TPP1.
  - TPP2 (this meeting) is to focus on data needs.

- Reviewed the HRR Findings.
  - Of the five sites identified in the CTT Range Inventory Report only the Batteries portion of the Hamilton Closed Complex MRS is eligible for the MMRP. None of the other sites had training with live firing.
  - The Batteries portion of the Hamilton Closed Complex MRS is only the footprint of the former batteries themselves. Only inert projectiles were used for training according to firing records; however, if powder bags used in the firing were improperly disposed of in the immediate vicinity of the batteries, they would constitute Munitions and Explosives of Concern (MEC) and potentially Munitions Constituents (MC) under MMRP. There is no evidence that such disposal occurred at Fort Hamilton.

- Since the batteries were removed, and the areas developed, no reports of abandoned powder bags, unexploded ordnance, or munitions debris have been reported at Fort Hamilton.
- The area of the former batteries has been altered through construction development, and no undisturbed site soil remains at the former battery locations.

III. Discussion

New York State Department of Environmental Conservation (NYDEC) representative Dan Eaton stated that he had anticipated no further action with respect to munitions at the site. In particular, he mentioned that he had spoken with other NYDEC staff familiar with the site, and their opinion was the same: no munitions at Fort Hamilton. He was familiar with the high level of disturbance throughout the site, and was perceptive to the specific nuances in site locations, histories, and past uses.

We had a lively discussion regarding the site history, and we took a brief site walk.

URS will send a copy of the stakeholder draft HRR Report this week for NYDEC review, likely to be complete by end of March.

We agreed that URS would prepare an SI Report, complete with MRSPP for the single eligible site, assuming after the HRR review that NYDEC concurred with the likely no further action recommendation based on historical data.