



2024 SECRETARY OF DEFENSE ENVIRONMENTAL AWARD

ENVIRONMENTAL RESTORATION – INDIVIDUAL/TEAM



Marine Corps Installations National Capital Region – Marine Corps Base Quantico, Quantico, Virginia

INTRODUCTION

Marine Corps Installations National Capital Region – Marine Corps Base Quantico (MCBQ), known as the *Crossroads of the Marine Corps*, was commissioned on May 14, 1917. The installation, located 35 miles south of the nation’s capital, lies within southern Prince William, northern Stafford, and eastern Fauquier counties. It is bounded on the east by the Potomac River. MCBQ occupies more than 59,000 acres with two sections split by Interstate-95 (I-95)—the “Mainside” (east of I-95) and Guadalcanal (Guad) Area (west of I-95). The Mainside is the most developed portion of the Base and is home to headquarters, housing, storage, supply, administrative, educational, medical, operational, maintenance, utilities, and other facilities. The Guad Area is primarily used for training.

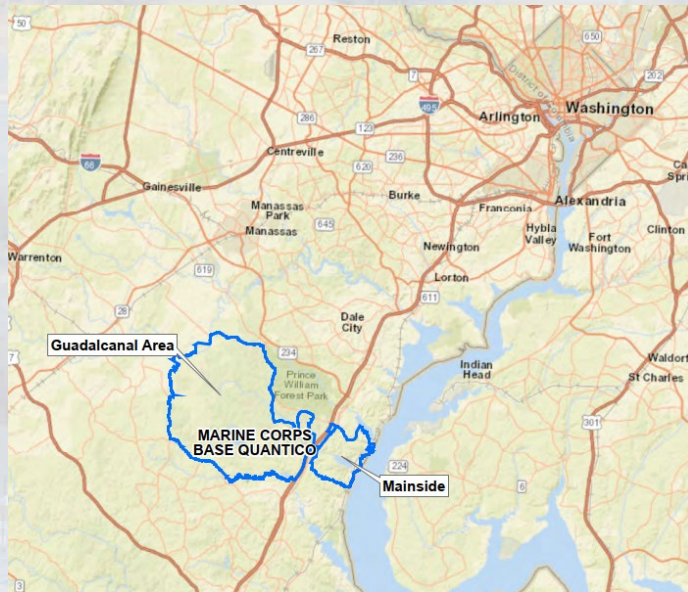


Figure 1 – Location of MCBQ

Historically, MCBQ has led the way in advancing vital concepts, training, equipment, and techniques in warfighting, especially expeditionary warfare, for which the Marine Corps is renowned. Today, that tradition of leadership and innovation is unwavering, with MCBQ providing critical infrastructure, facilities, and resources for the training and readiness of Marine Corps personnel. Essential support extends to military family members through military housing and extensive indoor and outdoor recreation facilities. MCBQ’s Mission commands and controls assigned organizations and provides facilities and services to tenant commands, military and civilian personnel, and family members in order to promote and sustain training and readiness and facilitate interagency, joint, and Service-level missions. Base tenants include colleges, schools, and other Marine Corps Commands. In addition, the Department of Justice complex consisting of the Federal Bureau of Investigation (FBI) laboratory/academy and Drug Enforcement Administration academy is located on the Base.

BACKGROUND

Environmental Restoration Program Summary

MCBQ’s mission has historically required the use, handling, storage, and disposal of hazardous materials and petroleum products. These products may have come into contact with the environment through accidental spills, leaks, and previously common waste disposal practices, resulting in conditions that do not meet today's stricter, more comprehensive environmental standards. In addition, because of training activities involving the live-firing of ordnance, former training areas and ranges require investigation and cleanup of the resulting munitions items, many posing potential explosive hazards. As a result, MCBQ has actively engaged in environmental investigations and remediation programs since 1981. In 1994, the U.S. Environmental Protection Agency (EPA) placed MCBQ on the National Priorities List. In 1998, MCBQ entered into a Federal Facility Agreement with EPA to ensure environmental impacts from past and present activities are investigated and appropriate remedial action is taken to protect public health, welfare, and the environment.

MCBQ’s Environmental Restoration Program (ERP) has aggressively pursued the protection of human health and the environment through prioritization of the environmental sites requiring action.



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MCBQ has worked extensively to foster collaborative partnerships with regulators, Marine Corps/Navy leadership, Base stakeholders, and the surrounding community. These efforts have yielded tremendous progress in investigating and cleaning up 276 sites to date (88 percent) with acceptance through the following environmental and regulatory programs: (1) Navy ERP consisting of the Installation Restoration Program and Munitions Response Program which follow the processes and procedures of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); (2) Resource, Conservation, and Recovery Act (RCRA) through the RCRA corrective action permit process; (3) Commonwealth of Virginia Underground Storage Tank Program; and (4) the Commonwealth of Virginia Solid Waste Program.

A recent success of the ERP at MCBQ was the May 2023 reopening a portion of the Lunga Recreation Area (including Lunga Reservoir) to military members and Department of Defense (DoD) civilians. The entire area was closed to public use in 2012 due to ongoing munitions investigations and associated munitions and explosives of concern (MEC) findings related to former artillery and mortar range firing activities. The closure of Lunga Recreation Area and development of an overall strategy for munitions cleanup to address potential explosive hazards and allow the recreation area to reopen posed a challenge for the Navy/MCBQ ERP team. The recreation area closure resulted in negative impacts on the MCBQ and surrounding community due to the absence of these critical morale, welfare, and recreation facilities. In addition, the unavailability of Lunga Recreation Area was detrimental to Marine Corps Community Services (MCCS) and their mission: “To take care of Marines and their families by providing quality of life programs, products, and services in support of the Marine Corps objectives.” This narrative discusses the efforts over the last 11 years through the ERP leading to the successful reopening.

Lunga Recreation Area

Lunga Recreation Area (also called Lunga Park) encompasses approximately 685 acres in the Guad Area of MCBQ. The recreation area generally consists of the Lunga Reservoir and the landside area on the eastern shore of the reservoir. Construction of Lunga Dam and establishment of Lunga Reservoir was started in the mid-1950s with completion in 1956. Lunga Recreation Area was opened in the early 1970s. The recreation area is operated by MCCS; its primary patrons are military members and DoD civilians. Major recreation activities and features within Lunga

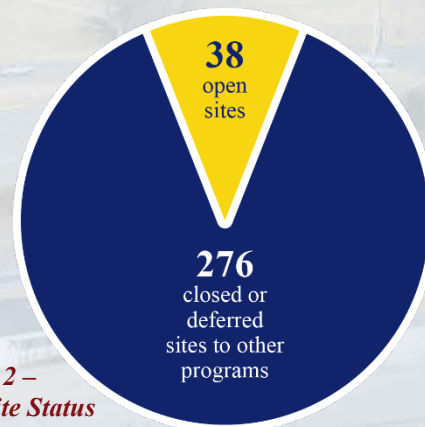


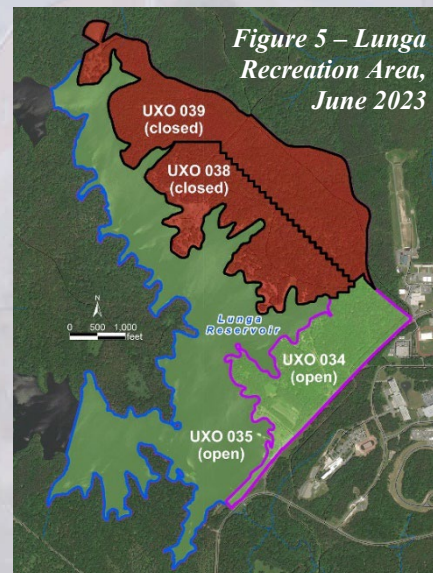
Figure 2 – ERP Site Status



Figure 3 – Soil Removal Action and Engineered Wetland Installation, Site 105, 2021



Figure 4 – 81-mm Mortar removed from Lunga Recreation Area, 2019





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Recreation Area include boating and fishing in the reservoir (no swimming allowed), camping areas (tents and recreational vehicles), picnicking areas and pavilions, a nature/fitness trail, playground areas, baseball fields, and a long-term recreational vehicle storage/parking area. Lunga Recreation Area was closed in April 2012 by the MCBQ Base Commander to public access and recreational use due to ongoing munitions investigations and associated MEC findings related to former artillery and mortar range firing activities. In May 2023, approximately 435 acres of Lunga Recreation Area including Lunga Reservoir were reopened to recreational use.

Navy and Marine Corps Base Quantico Environmental Restoration Team

The ERP at MCBQ is conducted by a core ERP team comprising representatives from Naval Facilities Engineering Systems Command (NAVFAC) Washington, MCBQ Natural Resources and Environmental Affairs (NREA) Branch, and NAVFAC Washington’s ERP contractor (CH2M).

- **NAVFAC Washington Remedial Project Manager (RPM):** Responsible for the overall management and implementation of the ERP at MCBQ providing for the protection of human health and the environment. Coordinates technical support agencies within the Navy and environmental contractors to meet ERP goals while following applicable policies, laws, and regulations. The RPM is the lead Navy individual responsible for all aspects of site management including communications, planning, budgeting, scheduling, and controlling the study, design, remediation, and long-term management.



*Victoria Waranoski,
NAVFAC Washington
RPM*

For Lunga Recreation Area: The NAVFAC Washington RPM was responsible for identifying appropriate munitions response sites (MRSs) within the ERP and prioritizing their investigation and cleanup. The RPM was responsible for the development of the Course of Action alternatives for the reopening approach and strategic investigation and remediation strategy for the recreation area’s reopening. In addition to representing the Navy and MCBQ with regulatory agencies from EPA Region III and Virginia Department of Environmental Quality (VDEQ), the RPM also collaborated with the MCBQ NREA ERP Coordinator to align priorities, expectations, and budgets for the reopening of the recreation area.

The most recent NAVFAC Washington RPM for ERP activities at Lunga Recreation Area was Victoria Waranoski. Other legacy RPMs contributing to the advancement and cleanup of Lunga Recreation Area include Allison Cantu, Preston Postl, and Frederick Evans.

- **MCBQ NREA ERP Coordinator:** Responsible for coordinating the ERP on MCBQ, working with the NAVFAC Washington RPM. Responsible for facilitating ERP activities with appropriate Base stakeholders and ensuring logistical coordination and access requirements at MCBQ are met to allow for efficient completion of investigation and cleanup actions.



*Dylan Lane,
MCBQ NREA
ERP Coordinator*

For Lunga Recreation Area: The MCBQ ERP Coordinator supported technical briefings with MCBQ stakeholder and command staff and provided enhanced access and clearance coordination with MCCA, FBI, MCBQ Range Control, U.S. Army Corps of Engineers (USACE) (for Lunga Dam water flow and construction information), Marine Corps Systems Command, and MCBQ Public Works Branch. The ERP Coordinator also provided the Base



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“perspective” on the importance of Lunga Recreation Area reopening during discussions with the Navy, EPA, and VDEQ.

Dylan Lane is the current MCBQ ERP Coordinator. Other legacy ERP Coordinators contributing to the advancement, cleanup, and reopening of Lunga Recreation Area include Rodney Aguirre, Brian Ventura, and David Grose.

- **NAVFAC Washington’s ERP Contractor (CH2M) Activity Manager (AM):** Responsible for the overall implementation of ERP fieldwork planning, investigation, and reporting for the ERP at MCBQ through multiple contract awards through the Navy’s Comprehensive Long-Term Environmental Action Program. Responsible for long-term forecasting of ERP activities through annual development of Site Management Plan. Serve as primary Navy technical support at meetings with regulatory representatives from EPA and VDEQ; support the Navy and MCBQ as needed/requested for meetings/discussions with MCBQ stakeholders.



*Jeff Woodward,
NAVFAC Washington
ERP Contractor AM*

For Lunga Recreation Area: The CH2M AM supported the development of the Course of Action alternatives and comprehensive investigation and remediation strategy for the recreation area’s reopening, working closely with the NAVFAC Washington RPM and MCBQ ERP Coordinator. In addition, the AM presented several reopening plans for consideration by Navy and MCBQ incorporating a wide range of land use options, cost projections, and project durations.

Jeff Woodward is the CH2M AM for the ERP MRSs and activities at Lunga Recreation Area and has been in that role since 2012.

Supporting organizations that contributed to the Lunga Recreation Area reopening as engaged and coordinated by the RPM and ERP Coordinator are discussed in the Accomplishments section.

ACCOMPLISHMENTS

On May 26, 2023, after 11 years of extensive munitions investigation and cleanup efforts conducted across more than 330 acres both on land and within the footprint of Lunga Reservoir, a portion of Lunga Recreation Area was reopened for recreational use. To support this cleanup, nine major investigations and removal actions were completed; eight through the ERP and one effort completed through the Operational Range Clearance (ORC) Program. Collectively, 590 MEC items were recovered, most of which were the 2.36-inch rocket. Almost 20 tons of munitions debris inspected and certified as material documented as safe were also removed from the recreation area. These activities resulted in the opening of approximately 435 acres (consisting of 98 acres on land and 377 acres of the Lunga Reservoir) for recreational use, with some limitations as detailed below. The ERP successfully tackled the following key challenges:

- **Lowering of Water Level in Reservoir:** To ensure munitions clearance was performed in underwater shoreline areas that could be periodically exposed to recreational users during drought events, the water level in the reservoir had to be substantially lowered. Because Lunga Reservoir is a secondary drinking water supply for MCBQ and Stafford County, Virginia, substantial coordination efforts were



Figure 6 – Lowered Reservoir Water Level and Exposed Shoreline, 2019



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required. The RPM and ERP Coordinator conducted an extensive campaign to engage both MCBQ and non-MCBQ stakeholders (including Public Works Branch, MCBQ NREA, USACE, and Stafford County) in this process and obtain endorsement on lowering the water level using the Lunga Dam to facilitate removal action activities. These efforts resulted in an agreement to lower the water level in the reservoir by 8 feet below normal water level conditions, reducing the capacity of the reservoir by approximately 50 percent (2 x 10⁹ gallons), and exposing approximately 230 acres for munitions clearance activities. Upon completion of these activities, the reservoir was allowed to recharge to the normal water level elevation.

- **Lunga Dam Repairs:** ERP efforts required coordination with USACE’s Lunga Dam safety upgrades and repairs completed in 2016 and 2017; these items included extensive engineered fill placement (to increase the overall height of the crest of the dam) and regrading. Lunga Recreation Area-experienced unexploded ordnance (UXO) technicians familiar with the ERP efforts were engaged by USACE (under the USACE contract) to support the dam repair construction, including removal and disposal of MEC items.

ERP contractors supporting the investigations and removal actions included CH2M, APTIM, Gilbane Federal, USA Environmental, Tetra Tech, and Shaw Environmental. The ORC Program contractor was GSI-Kemron.

In 2017, the RPM and ERP Coordinator began to strategize on how to reopen Lunga Recreation Area as they gained a clearer understanding of the extent of munitions impacts. To help evaluate options and associated timeline for the completion of the ERP actions and the reopening of the recreation area, the RPM and ERP Coordinator formed the Lunga Advisory Council, a multidisciplinary group of MCBQ stakeholders including representatives from the following organizations:

- G-F Installation and Environment Division
- Counsel Office
- Explosives Safety Office
- Range Management
- MCCC
- Public Works Branch
- FBI
- NREA (ERP Coordinator)
- NAVFAC Washington (RPM)

The Lunga Advisory Council met periodically starting with the final phase of the ERP investigation and removal action process and agreed to an innovative strategy to open Lunga Recreation Area through the use of an Interim Land Use Control (LUC) Plan issued through a MCBQ Base Order from the Base Commander. Although extensive munitions cleanup was completed, as discussed herein, LUCs were deemed appropriate because of the potential for explosive hazards (MEC) in the subsurface areas that were inaccessible for investigation (for example, underneath buildings or trees) or at deeper excavation depths beyond 12 inches. An exhaustive evaluation of LUCs was performed as part of this process, resulting in the following major LUC elements to support the reopening of the recreation area:

- **Engineering Controls:** Fencing and signage to restrict access to select areas of Lunga Recreation Area to the north (remaining closed to recreational use) and the adjacent FBI Academy (not part of the recreation area). Signage was added to warn recreational users to avoid exposed root balls from downed trees, comply with boating and fishing requirements, avoid entering active training areas to the west across the reservoir (via boat using the reservoir or the western shoreline), and avoid entering portions of the recreation area to the north still closed.



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- **Institutional Controls:** Implemented with the primary goal of communicating munitions safety awareness to recreation area patrons, visitors, and operational staff including:
 - Safety Brochure for Lunga Area Visitors: Communication of munitions safety awareness (3Rs for Recognize, Retreat, and Report of potential munitions items) with the brochure provided to new visitors at the camp store, and the office used for new visitor registration and check-in.
 - Updated Registration and Visitor Communication (Fees Brochure): Identifying restrictions for recreational users (for example, no digging, campfires and cooking fires in designated fire rings only; no swimming/wading in the reservoir).
 - Munitions Safety Awareness for Lunga Recreation Area Staff: Following the principals of DOD Environment, Safety and Occupational Health Network and Information Exchange Explosives Safety Education.
 - Incorporation into future MCBQ Installation Master Planning documents.
 - Excavation Permit Process: Administrative mechanism to provide potential excavators and construction staff notice of the potential munitions items, associated land use restrictions, and the need for onsite UXO construction support (depending on the depth and area of excavation).
 - Recording of the Interim LUCs in the Naval Installation Restoration Information Solution LUC Tracker.
 - Issuance of a Base Order notice that the southern parcel of Lunga Recreation Area is reopened for recreational use and this Interim LUC Plan is disseminated throughout MCBQ.
- **UXO Construction Support:** The requirements for UXO construction support for ground-disturbing activities at the reopened Lunga Recreation Area.



Figure 7 – Lunga Recreation Safety Brochure, May 2023

The LUCs and associated information on Lunga Recreation Area were published through the MCCS Lunga Park website and MCBQ iSportsman website to effectively reach potential visitors to the recreation area. In addition, ERP-related activities pertaining to the removal actions were communicated to the public via multimedia efforts through the Base Community Involvement Plan including the MCBQ ERP website, MCBQ Facebook page, and hardcopy postings at the information repositories, both on- and off-Base.



Figure 8 – Boat Dock Area, Lunga Recreation Area Reopening, May 26, 2023

Although the issuance of the Interim LUC Plan was not a direct outcome of a CERCLA record of decision, the RPM and ERP Coordinator’s strong relationship with the regulatory Partnering Team, including EPA Region III and VDEQ, allowed for successful completion and



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approval of investigation and removal action work plans, reports, and action memorandums. In addition, EPA also provided valuable input for the interim LUCs.

The RPM and ERP Coordinator also engaged the Base Explosives Safety Officer and Marine Corps Systems Command (MARCORSYSCOM) in the Lunga Recreation Area reopening through the last removal action After Action Report, which included the Interim LUC Plan. MARCORSYSCOM and the Department of Defense Explosives Safety Board concurred with the reopening of Lunga Recreation Area under LUCs identified in August 2022.

Marine Corps Base Order 5090.1 (Interim Land Use Control Plan Lunga Recreation Area) was issued on December 15, 2022. Subsequently, after the completion of infrastructure improvements and renovations to recreation area buildings and features completed by MCBQ/MCCS, Lunga Recreation Area was reopened on Saturday, May 26, 2023

(<https://www.quantico.marines.mil/News/Article/3447222/lunga-park-treasured-resource-reopens/>
<https://www.quantico.marines.mil/News/Article/3387989/lunga-park-opens-after-being-closed-for-more-than-a-decade/>) with a daylong celebration

including a reopening ceremony by the Base Commander. The RPM and ERP Coordinator, in conjunction with MCCS and other MCBQ staff, shared historical information regarding the ERP activities at Lunga Recreation Area, the overall efforts completed to reopen the recreation area, and handouts/supporting information to promote the LUCs implemented. These community outreach efforts included a poster table with oversized posters and photos of the recreation area and numerous handouts including: Safety Brochure; 3Rs munitions safety awareness with stickers, guides, and coloring books; and a postcard explaining the ERP, their work at MCBQ, and the associated MCBQ point of contact (ERP Coordinator). Since reopening over five months, over 2,300 visitors have enjoyed the renovated and reopened Lunga Recreation Area.



Figure 9 – Lunga Recreation Area Reopening Community Outreach, May 26, 2023

NAVFAC Washington allocated approximately \$25M to date through the ERP to support the reopening of Lunga Recreation Area and ultimately helping the Base and MCCS achieve their mission. ERP efforts continue at adjacent areas of Lunga Recreation Area currently closed to recreational use.



Figure 10 – Lunga Recreation Area Renovated, May 2023