

Proposed Plan
for the Former
Nike Site CL-59

City of Parma Heights
Cuyahoga County, Ohio

August 4, 2010

Prepared by:



**US Army Corps
of Engineers®**

**United States Army Corps of Engineers
Louisville District**

Proposed Plan for the former Nike Site CL-59

Version 2.0

City of Parma Heights
Cuyahoga County, Ohio

Prepared by:

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LIST OF ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
bgs	Below Ground Surface
BRA	Baseline Risk Assessment
BUSTR	Bureau of Underground Storage Tank Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Chemical of Concern
COPC	Contaminant of Potential Concern
COPEC	Contaminant of Potential Ecological Concern
CDI	Chronic Daily Intake
DD	Decision Document
DAD	Dermal Absorbed Dose
DERR	Division of Emergency and Remedial Response
DoD	Department of Defense
EPC	Exposure Point Concentration
EU	Exposure Unit
FS	Feasibility Study
FSI	Focused Site Inspection
FUDS	Formerly Used Defense Sites
GSA	General Services Administration
HI	Hazard Index
HHRA	Human Health Risk Assessment
HIPAR	High Power Acquisition Radar
IFC	Integrated Fire Control
ILCR	Incremental Lifetime Cancer Risk
IRIS	Integrated Risk Information System
MDC	Method Detected Concentration
MCL	Maximum Contaminant Level
MW	Monitoring Well
µg	Microgram
NDMA	N-nitrosodimethylamine
ODNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
PA	Preliminary Assessment
PAH	Polynuclear Aromatic Hydrocarbon

PRG	Preliminary Remediation Goal
PPRTV	Provisional Peer Reviewed Toxicity Value
RGO	Remedial Goal Option
RAO	Remedial Action Objective
RI	Remedial Investigation
RL	Reporting Limit
RfD	Reference Dose
SI	Site Inspection
SL	Screening Level
SLERA	Screening Level Ecological Risk Assessment
SVOC	Semivolatile Organic Compound
TTR	Target Tracking Radar
UCL	Upper Confidence Limit
USACE	U.S. Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VA	Veterans Administration
VOC	Volatile Organic Compound

1. Introduction

The military services do environmental work funded by the Defense Environmental Restoration Program to restore sites by addressing environmental contamination. The Formerly Used Defense Site (FUDS) program covers properties that were once used by any military service prior to October 1986. The FUDS program is a part of the Defense Environmental Restoration Program. The Department of Defense (DoD) is responsible for evaluating and cleaning up DoD generated contamination on FUDS properties. The Army oversees the program for DoD and the U.S. Army Corps of Engineers (USACE) manages the evaluation and cleanup of these properties. When a property is evaluated work is planned to ensure that the property is cleaned up in such a way that is protective of human health, safety and the environment. For some properties it may be found that no cleanup work is necessary to protect human health, safety and the environment and in that situation the Corps of Engineers still provides one or more documents presenting the findings of the property investigation.

The USACE Louisville District is responsible for the environmental investigation and cleanup programs at the former Nike CL-59 site. The Louisville District has determined that the site was eligible for work under the FUDS Program.

The U.S. Army, in consultation with the Ohio Environmental Protection Agency (Ohio EPA), issues this Proposed Plan to present the findings of environmental investigations and recommended action for the former Nike CL-59 (Figure 1). The U.S. Army, in consultation with Ohio EPA, will select the remedy for the Nike CL-59 after reviewing and considering all information submitted during the 30-day public review period. This Proposed Plan provides the public with information necessary to participate with the U.S. Army and the Ohio EPA in the selection of an appropriate action. Therefore, the public is encouraged to review and comment on this Proposed Plan.

The detailed information concerning environmental investigation work that has been done at the Nike CL-59 is presented in Section 3 of this Plan. Sections 3 and 5 present the rationale to support the recommendation for the site. The Army is issuing this Proposed Plan as part of its public participation

Information used in selecting the preferred alternative in this proposed plan is available for public review online at:

<http://bit.ly./NikeCL59>.

Copies of this document and supporting documents are available at the following information repository in Northern Ohio:

Cuyahoga Community College
Western Campus
West Student Service Center
(Galleria)
Library – Room WSS - G111
11000 Pleasant Valley Road
Parma, OH 44130
(216) 987-5410
1-800-954-8742

8 a.m. to 5 p.m. Monday through
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responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations, Part 300).

The Proposed Plan summarizes information that can be found in greater detail in other documents. These supporting documents can be found on the internet and at the Cuyahoga Community College. The U.S. Army encourages the public to review these documents to gain a more comprehensive understanding of the site and activities that have been conducted to date.

2. Site Background

The idea of adding a surface-to-air missile system to the United States inventory of weapons and combat systems was conceived near the end of World War II and developed during the early years of the Cold War. With an increasing perception of a direct Soviet bomber threat to the American mainland, the Army rushed the Nike Ajax system into production and deployed the missile system around key urban, military, and industrial locations including the Cleveland metropolitan area.

The Nike Ajax missile was 21 feet long and the missile with its booster was 34 feet 10 inches in length. The missile flew at a speed of Mach 2.3. The sustainer engine was liquid-fueled and the booster rocket was solid-fueled. The missile was made with three high-explosive fragmentation warheads mounted in the nose, center, and aft sections of the missile.

Nike batteries were divided into two areas. Each battery had a Launch complex and an Integrated Fire Control (IFC) or Control area. The sections were separated by at least one thousand yards, with the IFC occupying the higher ground where feasible for radar purposes. The sites were separated because the Missile Tracking Radar (MTR) needed to be distanced from the launch area in order to track fired missiles. The IFC area usually had barracks, a mess hall, and the radar and control systems needed to direct the missiles.

There were usually three radars at the IFC areas: the Target Tracking Radar (TTR), the Missile Tracking Radar (MTR), and the Nike acquisition radar. The Nike crew followed the incoming aircraft using the acquisition radar. If the aircraft was deemed hostile the aircraft location was communicated to the TTR. If a missile was launched, the MTR would follow the missile flight and would receive updates from the TTR.

Using the flight information from both radars guidance information was communicated to the missile in order to guide the missile to the aircraft's position in the sky.

As the Nike Ajax system underwent testing during the early 1950s, the Army became concerned that the missile was incapable of stopping a massed concentration of Soviet aircraft. To enhance the missile's capabilities, the Army explored the feasibility of equipping the Ajax missile with a nuclear warhead. When that proved impractical in July 1953 the service authorized development of a second generation surface-to-air missile, the Nike Hercules.

In 1958, five years after the Army received approval to design and build the system the Nike Hercules was deployed at converted Nike Ajax batteries located in the New York, Philadelphia, and Chicago defense areas. Additional Nike Hercules missiles were deployed at other locations over the next six years.

The radars at the Hercules installations were sometimes supplemented with an additional radar to provide information about aircraft when multiple aircraft were airborne. This additional radar was the high power acquisition radar (HIPAR).

The Nike Hercules had a length of 41 feet and it flew at a speed of Mach 3.65. It was made with a solid propellant missile sustainer and a solid propellant booster. The missile warhead was either a high-explosive fragmentation warhead or a nuclear warhead.

During the course of the Cold War, the Army deployed 145 Nike Hercules batteries. Of that number, 35 were built exclusively for the new missile and 110 were converted Nike Ajax installations.

3. Site Characteristics

The Nike Site CL-59 missile installation occupied 187.2 acres. The installation included an IFC area, a Launch Area, a maintenance area and open space between the IFC and Launch Areas. The IFC Area for Nike CL-59 was located west of the Launch Area in a location that is the present day Nathan Hale Park, near the intersection of Sesquicentennial Park Road and Oakdale Drive. The Launch Area for Nike CL-59 was located on the North side of the present day West Pleasant Valley Road. A park designated as Nike Park is located South of Nathan Hale Park and West of the Cuyahoga Community College West Campus. (Figure 2, Figure 3 and Figure 4) The space that is currently Nike Park was not used for Army operations during the time the Army was operating the missile installation but the space did provide clear area for unobstructed operation of the radars.

Former Nike Site CL-59 was activated in July 1956 and deactivated in 1961. During its operational period, Nike Site CL-59 was retrofitted to allow it to launch Nike Hercules missiles. (Morgan and Berhow, 2002) After deactivation, the site was briefly used to support Army Reserve training.

The Army acquired the property by permit from the Veterans Administration (VA) by letter transfer. In January 1968, the site was reported excess to the General Services Administration (GSA). The property was later disposed of to various local public entities between 1969 and 1971.

The Nike Site CL-59 Control Area was built west of the former Crile Hospital. The hospital was built in 1943 and in 1946 the hospital was transferred to the newly created VA. The Crile Hospital was closed in 1964. The Nike CL-59 Control Area was not constructed on any area actively utilized by the hospital but there was a small area of the Crile Hospital property that was taken to create the Nike CL-59 installation.

The Launch Area for Nike Site CL-59 was located on the eastern side of the installation property. (Figure 2 and Figure 3) The CL-59 Launch Area contained three underground missile magazines. One was a design modified to handle both Ajax and Hercules missiles and the other two magazines were designed for the Ajax missile only. The site was equipped with 30 Ajax Missiles. Other structures at the Launch

Area included Barracks, Missile Assembly and Test Building, Generator Building, and Acid Fueling Station.

Cuyahoga Community College was created in 1965 and took the property of the vacated Crile Hospital facility for the College's western campus in 1966. The College constructed new educational buildings for its western campus beginning in 1972. The college never used any Nike installation structure or building for its operations.

In 1998, a Limited Phase I Environmental Site Assessment of the land formerly occupied by the Crile Hospital and Nike Site CL-59 was conducted for Cuyahoga Community College. The assessment concluded that "there is no evidence that the site may have been extensively contaminated by the operation of either Crile Hospital or the Nike Missile Site but there is some potential for localized environmental impairments directly associated with specific work and research operations including the use of degreasers and solvents, operations related to petroleum underground storage tanks and hydraulic elevators, battery maintenance operations and incinerator ash disposal [the incinerator was associated with hospital operations]."

In 2000, the USACE Louisville District and its agent, AmTech Engineering, Inc. planned work to remove two underground tanks from the Nike CL-59 Control Area. One of the tanks was used for gasoline storage and was located under a parking lot. This tank was found to be a 5000 gallon tank. The other tank held diesel fuel and was located under a soccer field. This tank was found to be a 6000 gallon tank. The tanks were removed and closed in accordance with the State of Ohio Bureau of Underground Storage Tank Regulations (BUSTR). Samples of the soil at both the diesel tank and the gasoline tank locations did not show evidence of contamination. In February 2001, the Bureau of Underground Storage Tanks formally stated in a letter that the Control Area site had been deemed as being in no further action status.

A Preliminary Assessment (PA) covering both the Launch and Control Areas of former Nike Site CL-59 was completed by USACE in 2002. As part of the PA, analysis of historic aerial photographs (covering the period from 1952 through 1994) was performed. As depicted on the 1959 and 1962 aerial photographs, two ground scars were identified on the northern portions of the former launch area site. These two areas were later investigated during a Site Inspection (SI) conducted by USACE.

The PA did not find any evidence of contamination beyond the underground tanks that had already been addressed in work completed by the Louisville District and its agent AmTech Engineering, Inc. After the completion of the tank removal action and the PA the Control Area was considered to not require further action.

A Site Inspection (SI) covering the Nike CL-59 Launch Area was completed by USACE in 2002. The findings of the PA relating to the Launch Area were utilized in determining the sampling locations and analytical tests for the SI. During the SI field effort, eight surface and 22 subsurface soil samples were collected, as well as one screening groundwater sample. A variety of organic compounds, primarily Polynuclear Aromatic Hydrocarbons (PAHs) and two metals (arsenic and iron) were detected and subsequently compared to United States Environmental Protection Agency (USEPA) Region 9 residential soil and tap water Preliminary Remediation Goals (PRGs). Based on this information, it was decided that further investigation and/or assessment was warranted in order to determine if clean up would be necessary for Nike Site CL-59 Launch Area.

A Focused Site Inspection (FSI) covering the Launch Area was completed by USACE in 2007. The FSI was conducted to determine if the PAHs and metals detected during the SI were related to the Nike site activities or were present area-wide. Twelve surface soil samples were collected for analysis of geotechnical and chemical characteristics relating to contaminant transport and availability as well as PAHs and metals. One off-site and two on-site groundwater monitoring wells were installed, and sampled, in order to assess groundwater quality.

The data collected showed arsenic and PAH constituents at concentrations that merited evaluation. PAHs are commonly found throughout the country, and the PAHs found in the Nike Site C-59 results may not have originated from the Nike operations. The arsenic concentrations were similar to those found in background concentrations in Ohio and other Midwestern states. There was no evidence that the Nike operations caused contamination beyond what could be expected to be found at the site due to regional causes. Minerals in the soil could account for the arsenic concentrations and combustion of fossil fuels and operation of ordinary motor vehicles could account for the PAH concentrations.

4. Scope and Role

The Secretary of the Army has been designated as the DoD Executive Agent for the FUDS Program. FUDS are defined as real property that was under the jurisdiction of the Secretary and owned by, leased by, or otherwise possessed by the United States (including governmental entities that are the legal predecessors of DoD or the Components) and those real properties where accountability rested with DoD but where the activities at the property were conducted by contractors that were transferred from DoD control prior to 17 October 1986. The term "Secretary" means the Secretary of Defense and the Secretaries of each of the Military Departments, as well as the Secretaries of any predecessor departments or agencies of DoD. The FUDS eligibility status of former DoD property is not affected by its being the current responsibility of another federal agency. Funding for FUDS is programmed and budgeted as a part of the DoD environmental restoration account.

The USACE serves as the DoD Execution Agent for cleanup of FUDS. USACE manages the cleanup of more than 9,000 potentially contaminated sites ranging from military training sites containing ordnance to industrial operations and production facilities containing solvents, organic materials and petroleum contamination.

The USACE Louisville District is responsible for the environmental investigation and cleanup programs at the former Nike CL-59 site in accordance with CERCLA. The Louisville District has determined that the site was eligible for evaluation under the FUDS Program.

5. Summary of Site Risks

A baseline human health risk assessment (HHRA) was performed to evaluate potential risks and hazards from current and predicted future exposures to contaminated media at the Nike CL-59 Launch Area. The HHRA was conducted in accordance with an Ohio EPA-approved work plan. The concepts of exposure pathway and receptor are used in evaluating risk coming from exposure to agents in the environment. An

exposure pathway is the course an agent takes from a source to an exposed organism. A receptor is the exposed individual receiving the exposure by means of the exposure pathway. For example if a homeowner uses a well to supply water for household use and drinking water the well and water piping is the mechanism that allows contamination in the groundwater to reach the homeowner and the homeowner is the receptor.

The HHRA involves a series of steps to estimate human exposure and level of risk. One of the key steps is the definition of the human receptors. For the Nike CL-59 HHRA the College Student and College Faculty/Staff member were determined to be the receptors because the current land use is higher education. The only complete exposure pathway for the College Student and College Faculty/Staff member is by surface soil. The hazard indices for the College Student and College Faculty from exposure to surface soil are both 0.02, significantly less than the target hazard index of 1.0. Carcinogenic slope factors for PAHs were used to estimate cancer risks. The estimated baseline Incremental Lifetime Cancer Risk (ILCR) for surface soil to the College Student and College Faculty/Staff receptors are 2×10^{-7} and 2×10^{-6} , respectively. Both are below the Ohio EPA risk goal of 10^{-5} . The Ohio EPA uses an excess lifetime cancer risk goal of 10^{-5} . The use of this goal is explained in the Ohio EPA publication DERR-00-RR-038 dated June 28, 2005.

The ILCR for the Construction Worker receptor was 6×10^{-8} for surface soil and 2×10^{-7} for subsurface soil. The HI for the Construction Worker receptor was 0.1 for surface soil and was 0.4 for subsurface soil. All of these levels are below the Ohio EPA risk goals.

The chemicals detected in soil that contribute the most carcinogenic risk are benzo(a)pyrene and arsenic. Remedial Goal Options (RGOs) were calculated for these chemicals by setting a Target Risk (TR) of 10^{-5} and using the intake and cancer risk equations to solve for C_s (the soil concentration that would result in the target risk level). Under the current educational land use scenario, the lowest RGOs were determined for the College Faculty/Staff receptor. The RGO was 4 mg/kg for surface soil for benzo(a)pyrene. The RGO was 21 mg/kg for surface soil for arsenic. Both the arsenic and benzo(a)pyrene RGOs are higher than the maximum detected concentration (MDCs) in the soil samples collected from the Nike CL-59 installation.

The overall risk from exposure to shallow Nike CL-59 groundwater is contributed by arsenic levels that are similar to arsenic levels in groundwater in the Ohio region. (Matisoff et al. 1980) The arsenic levels are caused by minerals in the soil and similar levels could be found across the state.

The assumption of a complete exposure pathway between shallow groundwater and human receptors is not truly applicable to the situation in the community because the water in the community is supplied by the City of Cleveland, Division of Water using treated water from Lake Erie. In addition during the work to gather the data for Nike CL-59 the unit sampled by the installed wells was found to yield water at such low rates as to be not capable of producing water for a supply well.

Of the organic contaminants of concern (COC)s in groundwater, only PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene were detected in samples, and only at MW101 in 2005. In May 2009, groundwater samples collected from MW101 were analyzed for these contaminants. Benzo(a)pyrene was not detected in these groundwater samples from May 2009. It is reasonable to assume that the prevailing groundwater concentration at MW101 is at most 0.007 $\mu\text{g/l}$, i.e., below the

Region 9 tap water PRG (0.009 µg /l). Thus, the most recent groundwater data from 2009 suggest that PAHs in groundwater are not a human health concern at the Nike CL-59 site.

Ecological risk assessments are conducted to evaluate the likelihood that adverse ecological effects could result from the exposure to one or more chemical contaminants in the environment. An ecological risk assessment provides needed information to adequately evaluate ecological concerns as they relate to chemical contamination. The ecological risk assessment may consider plants and animals known to live on or near the site and evaluate the nearby habitat capability to support plant and animal life. A Screening Level Ecological Risk Assessment (SLERA) is performed to determine if ecological threats are almost, or entirely, absent and therefore no further work is needed; or if the ecological risk assessment should continue to determine whether risk exists; or if there is the possibility of adverse ecological effects, and a more detailed ecological risk assessment, with more information about the site, is needed. A SLERA was performed to evaluate ecological risks from current and potential future exposure to constituents at the Former Nike CL-59 Launch Area if no remedial action is taken. The SLERA concluded that there are no Constituents of Potential Ecological Concern for the Former Nike CL-59 Launch Area. This, combined with the absence of aquatic or terrestrial habitats on the site and the closest ecological resource being approximately 500 feet away, suggests that there are minimal ecological risks from any potential soil contamination from the Former Nike CL-59 Launch Area. The risk assessment acquired no evidence of ecological risk derived from the Nike CL-59 installation.

6. Remedial Action Objectives

Remedial Action Objectives (RAOs) may be developed for protection of human health and/or for protection of ecological receptors. An earlier step in the development of the risk assessment is the development of pathway and media specific remedial goal options (RGOs) for individual analytes. The RGO concentration represents a concentration at which human health risk or ecological risk is acceptable. In the process of using the data gathered for the Nike Site CL-59 installation, it was determined that the maximum detected concentration for the individual analytes was below the respective RGOs. Since the RGO levels were not exceeded, RAOs were not needed for protection of human health and/or for protection of ecological receptors. This proposed plan therefore does not have remedial action objectives.

7. Summary of Alternatives

Since the site does not pose an unacceptable risk to human health and the environment, a set of remedial action alternatives was not developed and evaluated. Only the no further action alternative is therefore presented in this Proposed Plan.

8. Evaluation of Alternatives

A set of alternatives was not evaluated for addressing the site. The preferred alternative is no further action. The U.S. Army, in consultation with Ohio EPA, is recommending no further action with respect to Nike Site CL-59 including the Control Area and the Launch Area. If this recommendation is selected no additional environmental investigation or remediation will be performed.

9. Preferred Alternative

The preferred alternative is no further action. The U.S. Army, in consultation with Ohio EPA, is recommending no further action with respect to Nike Site CL-59 including the Control Area and the Launch Area. If this recommendation is selected, no additional environmental investigation or remediation will be performed and the Army's environmental actions for Nike Site CL-59 will be considered complete.

10. Community Participation

Public participation is an important component of remedy selection. The U.S. Army and Ohio EPA are soliciting input from the community on the preferred alternative. The comment period extends from August 6, 2010 to September 4, 2010.

The 30-day comment period provides an opportunity for public involvement in the decision-making process for the proposed action. All public comments will be considered by the U.S. Army and Ohio EPA before selecting the remedy. The public is encouraged to review and comment on this Proposed Plan. During the comment period, the public is encouraged to review documents pertinent to the Nike CL-59 installation.

Information used in selecting the preferred alternative in this proposed plan is available for public review on the Internet at the following internet address:

<http://bit.ly./NikeCL59>.

Copies of this document and supporting documents are available at the following information repository in Northern Ohio:

Cuyahoga Community College
Western Campus
West Student Service Center (Galleria)
Library – Room WSS - G111

11000 Pleasant Valley Road
Parma, OH 44130
1-800-954-8742

8 a.m. to 5 p.m. Monday through Friday

If the public would like to comment in writing on the Proposed Plan or other relevant issues, please mail written comments (postmarked no later than Sept. 4, 2010) to the address provided in this Proposed Plan.

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Army Engineer District Louisville
Engineering Division,
Environmental Engineering Branch
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KY 40201
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The U.S. Army will hold a public meeting at Cuyahoga Community College on August 24, 2010. This meeting will provide an opportunity for the public to comment on the proposed plan.

PUBLIC MEETING
Tuesday, August 24, 2010
7 - 8:30 p.m.

Cuyahoga Community College,
Western Campus

11000 Pleasant Valley Road,
Parma, OH 44130

Galleria, Room G04A-B

The U.S. Army will review the public's comments as part of the process in reaching a final decision on the most appropriate action to be taken.

A Responsiveness Summary, a document that summarizes the U.S. Army's responses to comments received during the public comment period, will be included in the Decision Document (DD). The U.S. Army's final choice of action will be documented in the DD.

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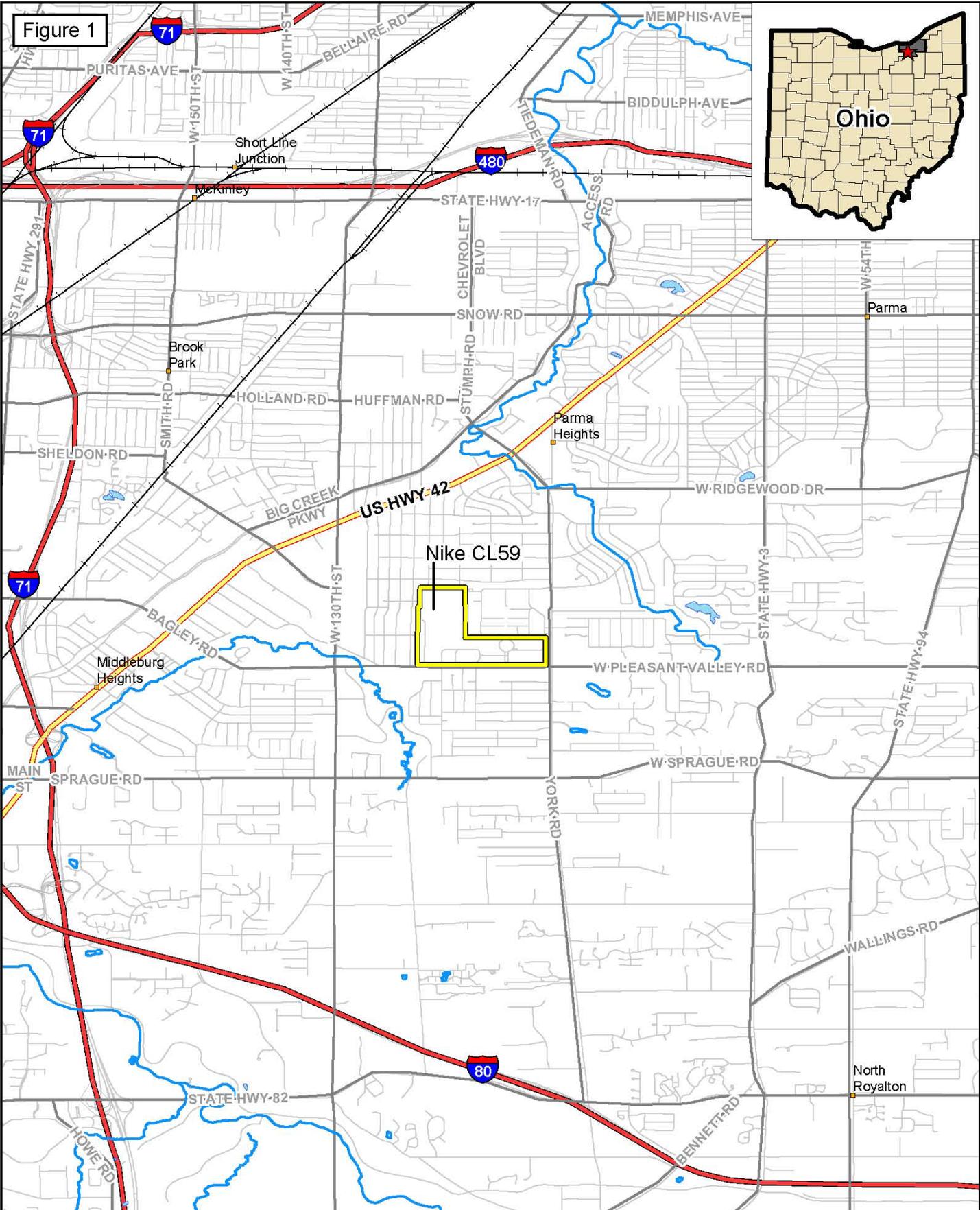
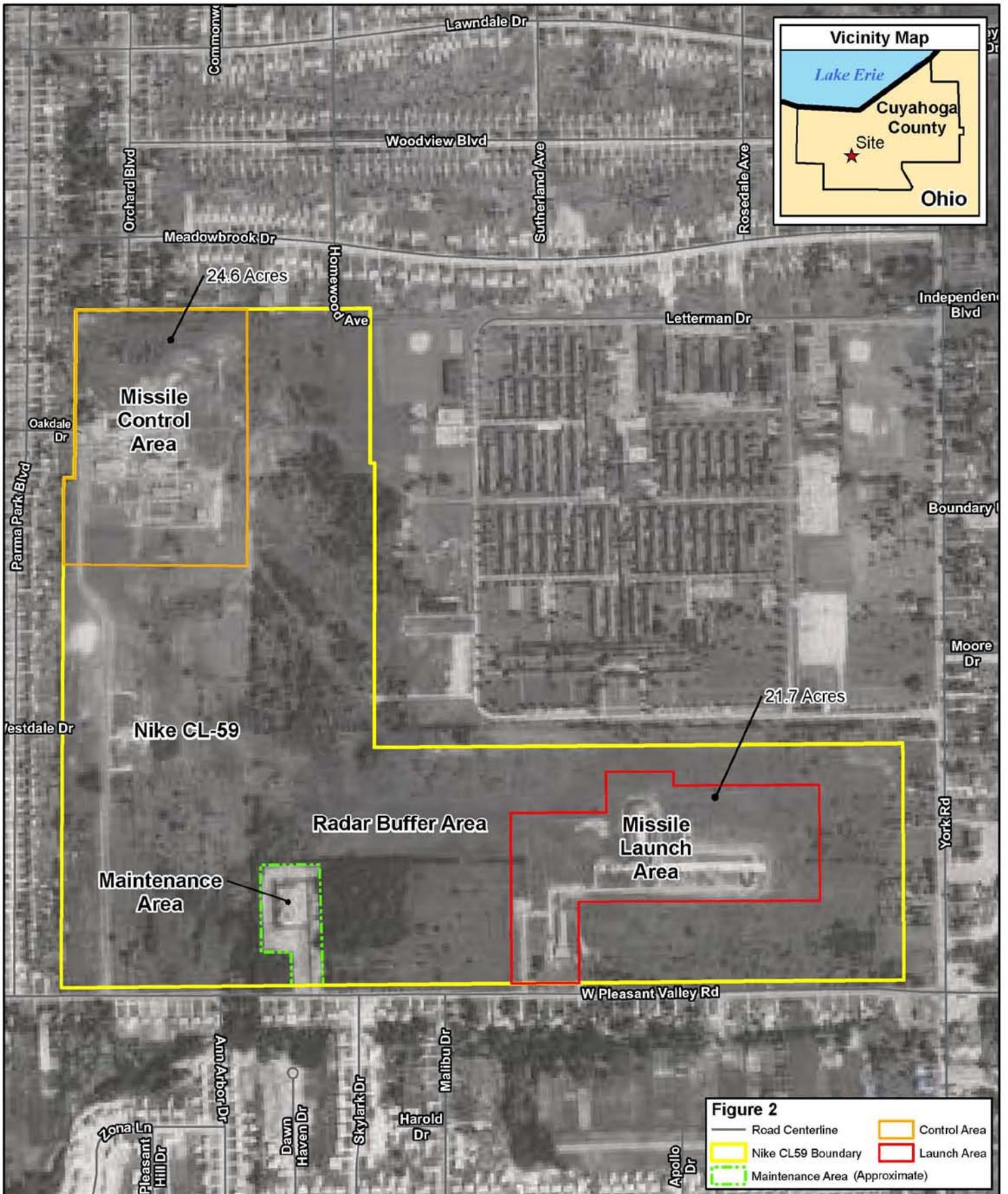


Figure 1

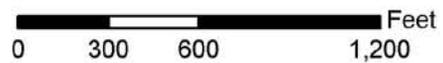


Former Nike Missile Site CL-59
General Location Map

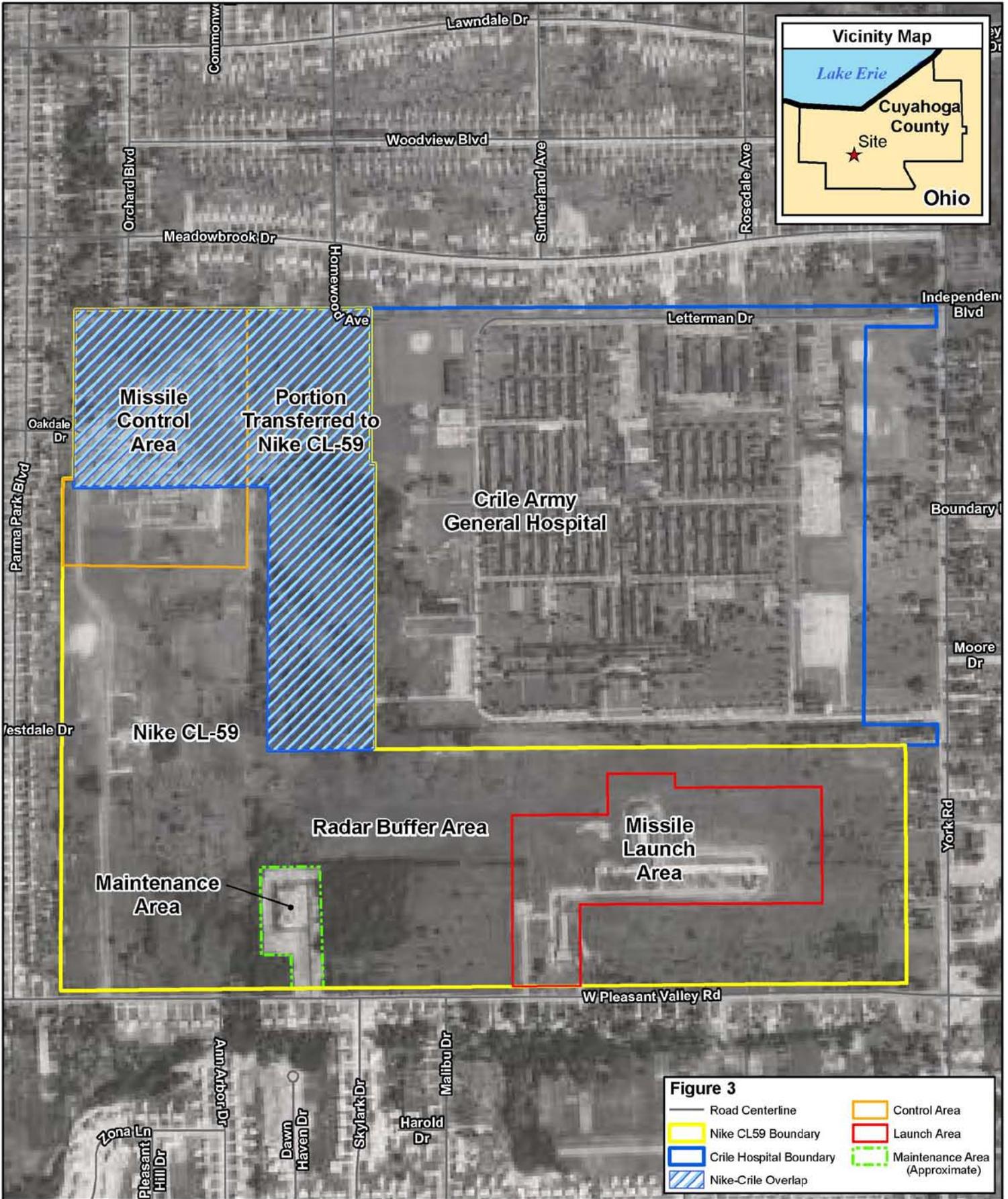




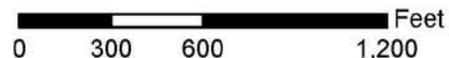
Former Nike Missile Site CL-59 with 1959 Aerial Basemap

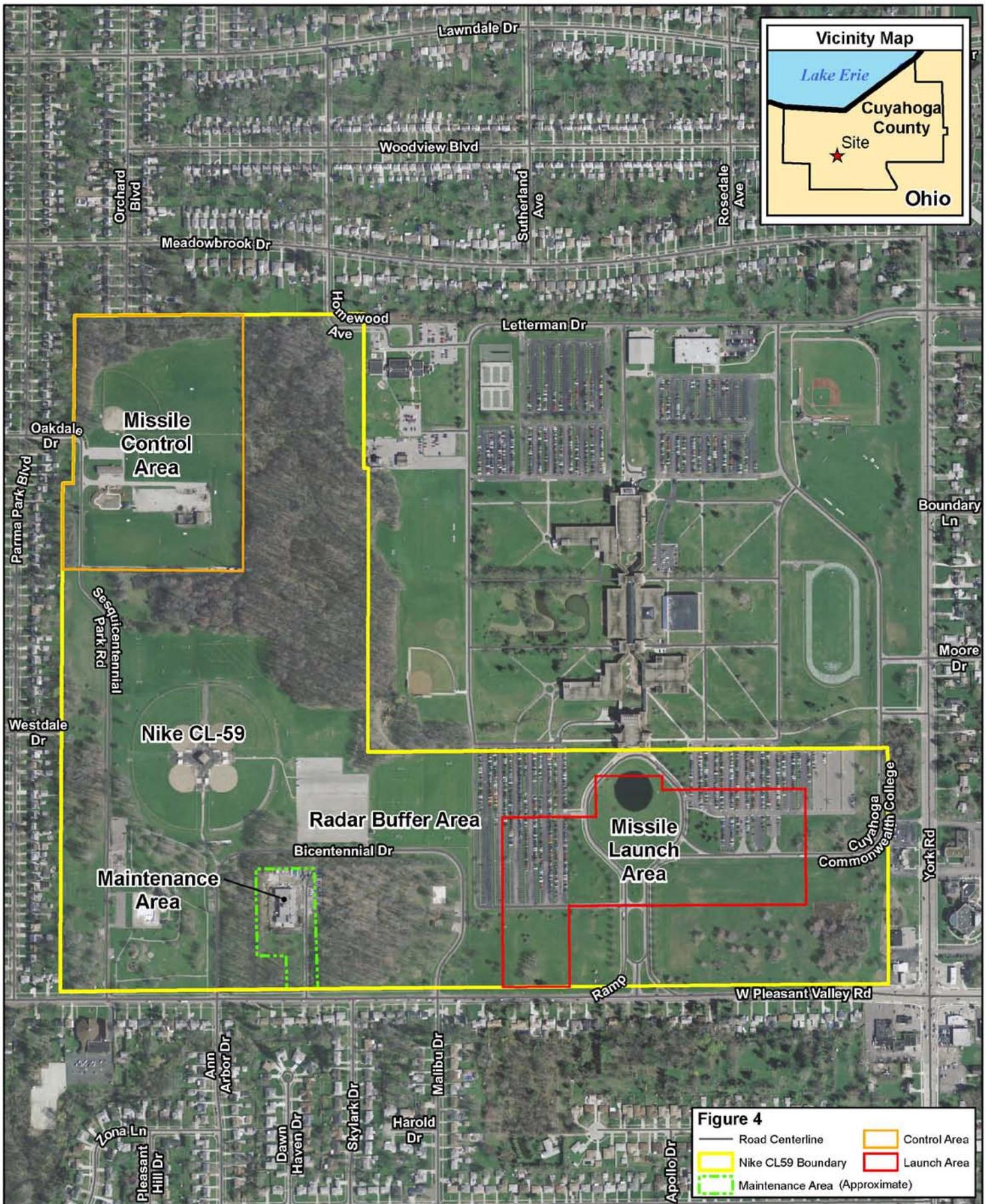


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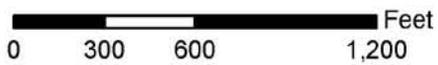


**Former Nike Missile Site CL-59
with Hospital Property Overlay
and 1959 Aerial Basemap**





Former Nike Missile Site CL-59 Missile Launch and Control Areas



US Army Corps
of Engineers
Louisville District

Figure 4

- Road Centerline
- Control Area
- Nike CL59 Boundary
- Launch Area
- Maintenance Area (Approximate)