FINAL

JOINT BASE McGUIRE-DIX-LAKEHURST, NJ

AIR INSTALLATIONS COMPATIBLE USE ZONES STUDY

AUGUST 2022

PREPARED FOR
87th Air Base Wing Civil Engineering Squadron
Delaware Ave, Building 5320, Joint Base McGuire-Dix-Lakehurst, New Jersey

U.S. AIR FORCE

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DEPARTMENT OF THE AIR FORCE
87TH AIR BASE WING (AMC)
JOINT BASE MCGUIRE-DIX-LAKEHURST, NJ

03 August 2022

MEMORANDUM FOR AREA GOVERNMENTS

FROM: JB MDL/CC
2901 Falcon Lane
JB MDL NJ 08641

SUBJECT: Air Installations Compatible Use Zones (AICUZ) Study for Joint Base McGuire-Dix-Lakehurst (JB MDL)

1. The 2022 AICUZ Study for JB MDL is an update of the AICUZ Study dated July 8, 2013. The United States Air Force initiated the update to assess mission changes such as the beddown of the KC-46A aircraft, and changes in the local land use and zoning since the last AICUZ Study was completed. This study is an evaluation of aircraft noise and accident potential related to Air Force flying operations and local land uses, in addition to noise related to JB MDL range operations. The Air Force provides this AICUZ Study to aid in the development of local planning mechanisms that will protect the public health, safety and welfare, as well as maintain and preserve the operational capabilities of JB MDL.

2. The AICUZ Study contains a description of the affected area around the installation. It outlines the location of runway clear zones, accident potential zones, and operational noise footprint (associated with both the McGuire and Lakehurst airfields as well as the range complex), and provides recommendations for development that is compatible with military operations. It is our recommendation that local governments incorporate these recommendations into community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.

3. This update provides noise contours based upon the day-night average sound level metric and utilizes a planning noise contour for aircraft operations. Chapter 4 of the study describes the metric in detail, along with noise metrics associated with range noise, Chapter 5 describes the safety zones, while Chapter 6 covers land use compatibility. Chapter 7 discusses roles of the Air Force and its neighbors in land use collaboration.

4. We greatly value the positive relationship JB MDL has experienced with its neighbors over the years. As a partner in the planning process, we have attempted to minimize noise disturbances by minimizing night flying and avoiding flights over heavily populated areas, schools, hospitals, and other noise-sensitive areas as much as possible. The Air Force appreciates and values the cooperation of all community stakeholders in the collaborative implementation of the recommendations and guidelines presented in this AICUZ Study update.

5. If you have any questions, comments or concerns, the initial point of contact for AICUZ matters at JB MDL is the 87th Air Base Wing's Public Affairs Office, at (609)754-2104. We thank you for your interest in AICUZ Planning.

B. WESLEY ADAMS, Colonel, USAF
Commander

Attachment:
Excerpt from AFH32-7084

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ABBREVIATIONS AND ACRONYMS

1-150th	1st Assault Helicopter Battalion, 150th Aviation Regiment
87 ABW	87th Air Base Wing
108 WG	108th Wing, NJ Air National Guard
305 AMW	305th Air Mobility Wing
514 AMW	514th Air Mobility Wing
AFH	Air Force Handbook
AFI	Air Force Instruction
AICUZ	Air Installations Compatible Use Zones
Air Force	United States Air Force
ALZ	Assault Landing Zone
APZ	Accident Potential Zone
ASA	United States Army Support Activity
ATC	Air Traffic Control
BASH	Bird/Wildlife Aircraft Strike Hazard
BCMAC	Burlington County Military Affairs Committee
BRAC	Base Closure and Realignment Commission
C5ISR	Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance, and Reconnaissance
CDNL	C-weighted Day-Night Average Noise Level
CFR	Code of Federal Regulations
CY	Calendar Year
CZ	Clear Zone
dB	Decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DoDI	Department of Defense Instruction
EIS	Environmental Impact Statement
EMI	Electromagnetic Interference
EOD	Explosive Ordnance Disposal
FAA	Federal Aviation Administration
FAR	Floor Area Ratio (also Federal Aviation Regulation)
FBI	Federal Bureau of Investigation
FCLP	Field Carrier Landing Practice
FHWA	Federal Highway Administration
FLIP	Flight Information Publication
GCA	Ground Control Approach
GIS	Geographic Information System
HAFZ	Hazards to Aircraft Flight Zone
(non-) HE	(non-) high-explosive
Hz	Hertz
JB MDL	Joint Base McGuire-Dix-Lakehurst
JLUS	Joint Land Use Study
LED	Light-Emitting Diode
LUPZ	Land Use Planning Zone
MAG 49	Marine Aircraft Group
mm	Millimeter
MOB	Main Operating Base
mph	Miles per Hour
NAVAIR	Naval Air Systems Command
NAWCAD	Naval Air Warfare Center Aircraft Division
NVG	Night Vision Goggles
PA	Public Affairs
PK	Peak Sound Pressure Level
REPI	Readiness and Environmental Protection Integration
SDZ	Surface Danger Zone
SLUCM	Standard Land Use Coding Manual
TAD	Tactical Arrival/Departure
T&G	Touch-and-Go
TDY	Temporary Duty
UAS	Unmanned Aircraft Systems
VFR	Visual Flight Rules
VR-64	Fleet Logistics Squadron 64

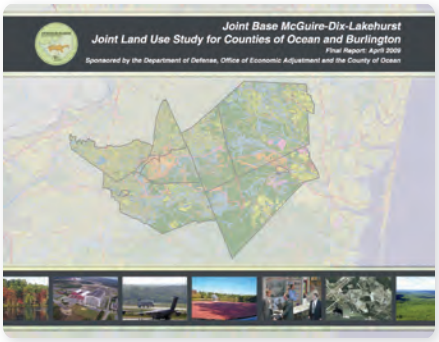
1. INTRODUCTION

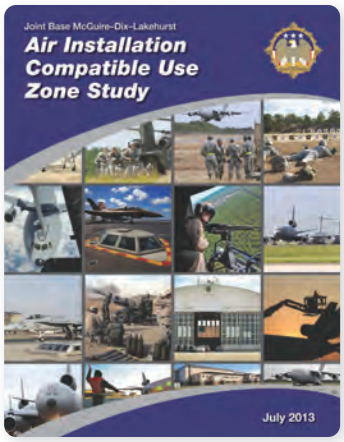
The 2022 Joint Base McGuire-Dix-Lakehurst (JB MDL) Air Installations Compatible Use Zones (AICUZ) Study focuses on the flying missions at JB MDL-McGuire, JB MDL-Lakehurst, which is comprised of Maxfield Field and the Test Site Complex, and JB MDL-Dix (all of these components are described in more detail in **Section 2.5**). This update presents and documents changes that have occurred since the previous AICUZ Study was released in 2013. It reaffirms the United States Air Force's (the Air Force's) policy of promoting public health, safety, and general welfare in areas surrounding an air installation while seeking development that is compatible with the defense mission. This study presents changes in flight operations since the previous study and provides planning noise contours and recommendations for compatible land use.

1.1 AICUZ PROGRAM

Military installations attract development; people who work on the installation want to live nearby, while others want to provide services to installation employees and residents. When incompatible development occurs near an installation or training area, affected parties within the community may seek relief through political channels that could restrict, degrade, or eliminate capabilities necessary to perform the defense mission. In the early 1970s, the Department of Defense (DoD) established the AICUZ Program. The goal of the program is to protect the health, safety, and welfare of those living and working near air installations while sustaining the Air Force's operational mission. The Air Force accomplishes this goal by promoting proactive, collaborative planning for compatible development to sustain mission and community objectives.

The AICUZ Program recommends that local land use agencies incorporate noise zones, Clear Zones (CZs), Accident Potential Zones (APZs), and the Hazards to Aircraft Flight Zone (HAFZ) associated with military operations into local community planning programs to maintain the airfield's operational requirements while minimizing the impact to residents in the surrounding community. Cooperation between military airfield planners and their community-based counterparts serves to increase public awareness of the importance of air installations and the need to address mission requirements and associated noise and risk factors in the community planning process. As the communities that surround airfields grow and develop, the Air Force has the responsibility to communicate and collaborate with local governments on land use planning, zoning, and similar matters that could affect the installation's operations or missions. Likewise, the Air Force has a responsibility to understand and communicate potential impacts that new and changing missions may have on the local community.





1.2 SCOPE & AUTHORITY

1.2.1 Scope

This AICUZ Study presents projected air operations for JB MDL. The Air Force provides JB MDL's CZs, APZs, and noise zones associated with the airfield's runways to the local communities, along with recommendations for compatible land use near the installation, for incorporation into local comprehensive plans, zoning ordinances, subdivision regulations, building codes, and other related land use documents.

1.2.2 Authority

Authority for the Air Force AICUZ Program lies in two documents:

- Air Force Instruction (AFI) 32-1015, *Integrated Installation Planning, implements Department of Defense Instruction (DoDI) 4165.57, Air Installations Compatible Use Zones,* and applies to all Air Force installations with active runways located in the United States and its territories. This AFI lays down the program objectives and responsibilities.
- Air Force Handbook (AFH) 32-7084, *AICUZ Program Manager's Guide,* provides installation AICUZ Program Managers with specific guidance concerning the organizational tasks and procedures necessary to implement the AICUZ Program. It is written in a "how to" format and includes the land use compatibility tables used in AICUZ studies.

1.3 PREVIOUS AICUZ EFFORTS AND RELATED STUDIES

Previous studies relevant to this AICUZ Study include:

- Joint Base McGuire-Dix-Lakehurst Joint Land Use Study (JLUS) for Counties of Ocean and Burlington (2009).
- Joint Base McGuire-Dix-Lakehurst Air Installation Compatible Use Zone Study (2013).
- Final Environmental Impact Statement (EIS): KC-46A Main Operating Base (MOB) 4 Beddown (2018).

1.4 CHANGES THAT REQUIRE AN AICUZ STUDY UPDATE

This 2022 JB MDL AICUZ Study replaces the 2013 AICUZ Study. It provides the installation's flight tracks, CZs, APZs, and noise contour information, presenting the most accurate representation of future military activities as projected to 2023, which is the assumed end state of the KC-46C transition noted below. With this information, the AICUZ Program allows surrounding communities to consider both current and potential activities when making land use decisions.

As the composition of the DoD aircraft fleet and training requirements change over time, the resulting flight operations change as well. These changes can affect noise contours and necessitate an AICUZ Study update. Additionally, non-operational changes, such as noise modeling methods and a local community's land use, may also require the need for an update. No new noise contours were produced for JB MDL – Lakehurst as operations have not significantly changed from 2013. The 2013 AICUZ included C-17 operations at both JB MDL – McGuire and JB MDL – Lakehurst (Maxfield) airfields, with the creation of the assault landing zone (ALZ).

The primary changes occurring since the 2013 JB MDL AICUZ Study that necessitate this update include:

Introduction of new aircraft. The Air Force Strategic Basing Process identified JB MDL as a future beddown location for a KC-46A air refueling squadron. Basing and operating the KC-46A at JB MDL will allow the Air Force to maintain combat capability and mission readiness as U.S. military resources become increasingly committed to missions throughout the world. As a result of this decision to beddown the KC-46A at JB MDL, an EIS was prepared. In the EIS, the Air Force evaluated and found JB MDL to be a reasonable alternative for the MOB 4 mission of 24 KC-46A aircraft. The 24 KC-46A aircraft replace 32 KC 10 aircraft stationed at JB MDL. As part of that replacement process, the Air Force evaluated the number of aircraft operations it would perform at JB MDL, and it was determined that there would be a slight decrease in annual tanker operations resulting from the change. The transition from the KC-10 to the KC-46A is expected to conclude in 2023.

Changes in off-installation land uses. Since the last AICUZ was prepared for JB MDL, land use and zoning changes have occurred in the region surrounding the installation, requiring a fresh evaluation to determine land use compatibility related to JB MDL aircraft and range operations.

Changes to AICUZ AFI. In 2019, the Air Force retired the previous AICUZ guidance (AFI 32-7063) and incorporated its information into AF 32-1015 (published July 2019, revised January 2021); however, there were no substantive changes to the AICUZ guidance and land use compatibility recommendations.

Changes to AICUZ APZs. Adoption across JB MDL of Air Force aircraft safety zones standards.

2. JOINT BASE McGUIRE-DIX-LAKEHURST, NEW JERSEY

2.1 LOCATION

JB MDL is located in south-central New Jersey, 18 miles southeast of Trenton, in Burlington and Ocean counties **(Figure 2-1).** As a tri-service joint base, JB MDL combines the former McGuire Air Force Base (Air Force), Fort Dix (Army), and Lakehurst Naval Air Engineering Station (Navy). In total, JB MDL encompasses just over 42,000 contiguous acres and spans over 20 miles from east to west. The three primary land areas within JB MDL are noted below and described in further detail in **Section 2.5:**

- **JB MDL – McGuire** occupies 3,562 acres within Burlington County and includes two runways, as well as various buildings and facilities;
- **JB MDL – Dix** occupies 31,190 acres straddling both Burlington and Ocean counties and includes training ranges and facilities; and
- **JB MDL – Lakehurst** occupies 7,430 acres within Ocean County and includes the Lakehurst Airfield Test Site Complex, Maxfield Field, an ALZ, and a test runway, among other facilities.

JB MDL is also within the northernmost portion of the Pinelands National Reserve, a region of central and southern New Jersey protected by federal and state statutes for its significant and unique natural and cultural resources.

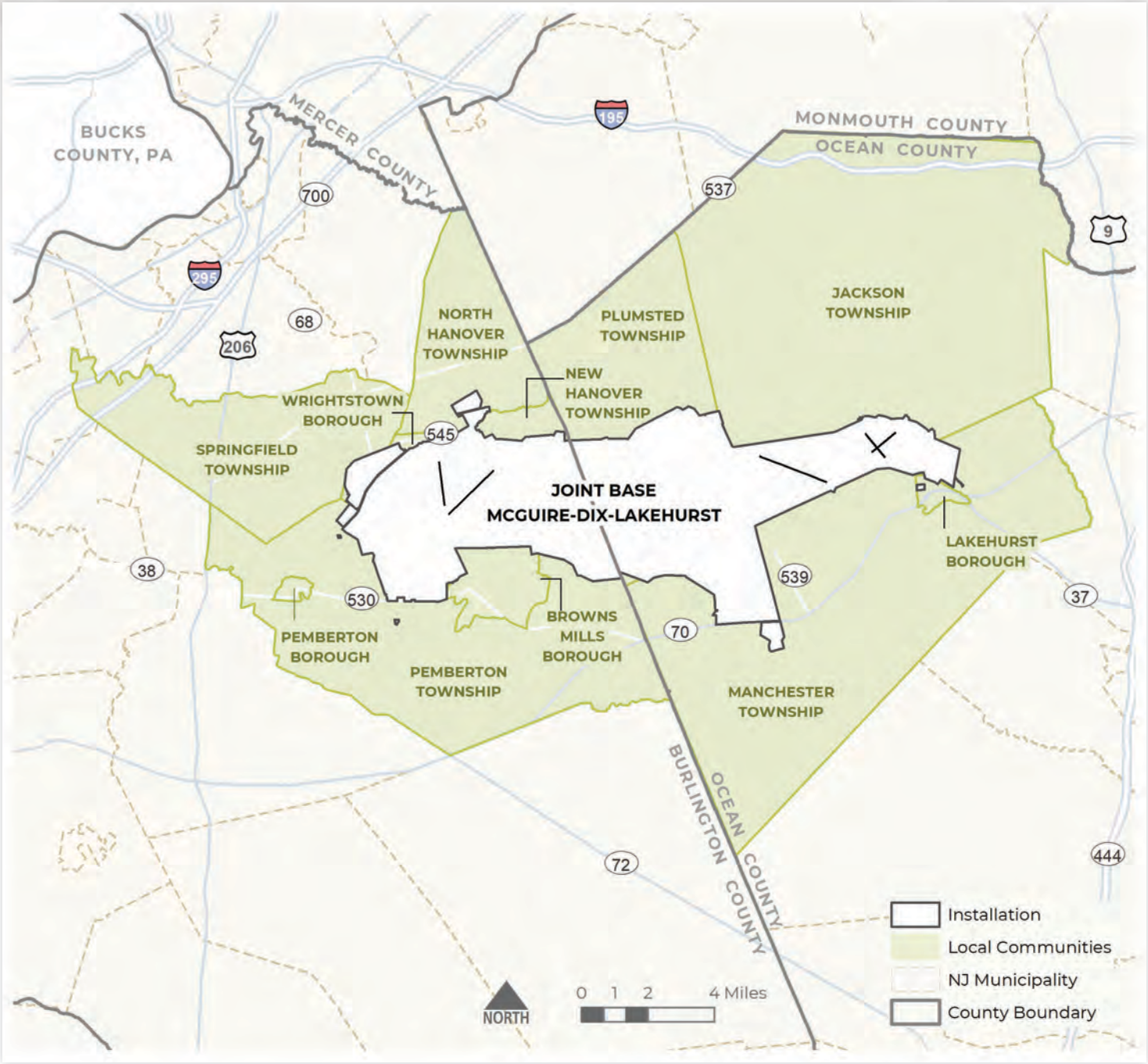


Figure 2-1 Regional Setting

2.2 HISTORY

JB MDL was created when the former McGuire Air Force Base, the Army's Fort Dix, and Naval Air Engineering Station Lakehurst merged in October of 2009. The merger occurred by recommendation of the 2005 Base Closure and Realignment Commission (BRAC), which also directed the support functions for Fort Dix and Naval Air Engineering Station Lakehurst to relocate to McGuire Air Force Base.

As one of 12 joint bases established through the 2005 BRAC process, JB MDL is host to a multitude of Air Force, Army, Marine Corps, and Navy assets. With every service represented on the installation, JB MDL brings integral resources to today's fight as America's premiere warfighting base.

2.2.1 JB MDL – McGuire

McGuire originated in 1941 as Fort Dix Army Air Force Base. By 1942, the airfield was supporting World War II missions, including training parachutists and receiving wounded soldiers from Europe. After closing briefly after World War II, it reopened in 1948 as McGuire Air Force Base in honor of Major Thomas B. McGuire, Jr., Medal of Honor recipient, and the second leading ace in American history.

▲ **Major Thomas B. McGuire, Jr.** was the second leading American Air Ace of World War II and a posthumous recipient of the Medal of Honor.
SOURCE: AIR FORCE HISTORICAL SUPPORT DIVISION.

▶ **Hangar 1 is a registered national historical landmark.** At one time, the hangar housed all of the Navy's rigid airships and Germany's two most famous airships, the Hindenburg and the Graf Zeppelin. SOURCE: JB MDL.

Over the years, McGuire Air Force Base supported many Air Force missions and grew famous as the Air Force's "Gateway to the East," when its core mission became global mobility in 1945. In 1992, it became part of the newly reorganized Air Mobility Command.

The 305th Air Mobility Wing served as the host wing from October 1994 to March 2009, when the newly activated 87th Air Base Wing assumed installation command. The 305th, along with the 21st Expeditionary Mobility Task Force, 108th Air Wing (ANG), 621st Contingency Response Wing, and the 514th Air Mobility Wing (AFRC), has supported every major type of air mobility mission over the past 15 years.

2.2.2 JB MDL – Dix

Fort Dix, built in 1917 as Camp Dix, is named after Major General John Adams Dix a veteran of the War of 1812 and the Civil War, and a former United States Senator, Secretary of the Treasury, and Governor of New York.

▲ **Major General John Adams Dix** was a veteran of the War of 1812 and the Civil War. He had a distinguished public career as a U.S. Senator, Secretary of the Treasury, Minister to France, and Governor of New York.

SOURCE: U.S. SENATE.

Camp Dix functioned as a training and staging ground for soldiers as early as World War I, while flight operations to support Camp Dix, at an adjacent airfield, took place as early as 1926. It continued as a training facility for active Army, Army Reserve, and National Guard units, as well as the Civilian Conservation Corps, after the war to the present day.

In 1939, Camp Dix became Fort Dix, a permanent Army post. Fort Dix supported training missions throughout World War II, the Vietnam War, and the Gulf War. In 1978, the first female recruits entered basic training at Fort Dix. In 1991, Fort Dix trained Kuwaiti civilians in basic military skills so they could take part in their country's liberation.

Dix ended its active Army training mission in 1988 due to Base Realignment and Closure Commission (BRAC) recommendations. It began a new mission of mobilizing, deploying and demobilizing soldiers and providing training areas for Reserve and National Guard Soldiers. In 1994, the United States Air Force Expeditionary Center was established as the Air Mobility Warfare Center on Fort Dix.

2.2.3 JB MDL – Lakehurst

Naval Air Engineering Station Lakehurst began as a remote ammunition proving ground for the Russian Imperial Government in 1915. The facility was acquired by the U.S. Army in 1917 as Camp Kendrick during World War I and the Navy purchased the property in 1921 for use as an airship station and renamed it as Naval Air Station Lakehurst.

Between 1921 and 1961, the station operated as a Lighter-than-Air Center for rigid airships and became the first trans-Atlantic international airport in the United States. During World War II, anti-submarine patrol blimps were operated from Lakehurst.

Lakehurst conducts the unique mission of supporting and developing the Aircraft Launch and Recovery Equipment and Support Equipment for naval aviation. The Electromagnetic Aircraft Launch System and the Advanced Arresting Gear system that will replace the existing steam catapults and the Mk-7 arresting gear are being developed and tested at Lakehurst at full-scale shipboard representative test facilities here.

Naval Air Engineering Station Lakehurst supported many missions, including the Naval Air Testing Facility, Naval Air Engineering Center, Naval Air Warfare Center, and the Naval Air Warfare Center Aircraft Division.

2.3 MISSION

With Air Force, Army, and Navy missions, JB MDL is the nation's only tri-service joint base and the largest DoD installation in the New York Metropolitan-Delaware Valley area. Located 18 miles southeast of Trenton, N.J., the 42,000-continguous acres are home to more than 80 mission partners and 40 mission commanders providing a wide range of combat capability.

U.S. Air Force

The 87th Air Base Wing is the host unit at JB MDL and provides installation management to the joint base. The wing reports to the Air Force Expeditionary Center, which is under the direction of the Air Mobility Command headquartered at Scott Air Force Base in Illinois. In addition to providing installation management, the 87th Air Base Wing also provides mission-ready, expeditionary airmen to support unified combatant commanders in ongoing military operations. During wartime, for example, the wing supports deployment and resupply of major combat units.

U.S. Army

As an Installation Management Agency-Army Reserve training, mobilization, and deployment center, JB MDL provides training support to active and reserve component units of all services and licensed non-DoD activities. JB MDL also serves as a major power projection platform, with the mission of receiving, training, equipping, and deploying military forces. In addition, JB MDL provides intra-area service support and services for off-base active and reserve component units.

U.S. Navy

JB MDL supports and develops the aircraft launch and recovery equipment and support equipment, a unique mission for naval aviation. The Navy conducts advanced research and development programs at JB MDL in support of worldwide air platform operations. JB MDL is also home to Naval Air Systems Command's aircraft platform interface support, development, and testing facilities. Aircraft carrier catapult and arresting gear research and development is conducted on one of the runways at JB MDL – Lakehurst. JB MDL also includes a complex of manufacturing and prototyping facilities, training facilities, and three active test tracks for aircraft landing simulations.

2.4 HOST AND TENANT ORGANIZATIONS

The following are some of the major tenant units within JB MDL that have active flying or range missions; they are grouped by their location at either JB MDL – McGuire, JB MDL – Dix, or JB MDL – Lakehurst:

JB MDL – McGuire

87th Air Base Wing (87 ABW)

The **87 ABW** is responsible for providing installation support to the DoD's only tri-service joint base. The wing also provides mission-ready, expeditionary warfighters to support unified combatant commanders in ongoing military operations. The 87 ABW consists of more than 3,100 military and civilian personnel from the Air Force, Army, and Navy.

305th Air Mobility Wing (305 AMW)

The **305 AMW** extends America's global reach by generating, mobilizing and deploying KC-10 Extender (being replaced by the KC-46 airframe) and C-17 Globemaster III aircraft to conduct strategic airlift and air refueling missions worldwide. Additionally, the 305 AMW operates two of America's largest strategic aerial ports (at JB MDL – McGuire and at Baltimore International Airport) supporting the delivery of cargo to combatant commanders abroad. The 305 AMW also provides aviation-related support for the joint base, as defined in the joint basing construct.

514th Air Mobility Wing (514 AMW), United States Air Force Reserve

The mission of the 514 AMW is to recruit, train, and sustain reserve citizen airmen to fly, fight, win, and overall enhance the nation's air mobility capability. The 514 AMW flies and also shares the responsibility of maintaining the aircraft assigned to the active duty 305 AMW, including the KC-10 Extender (being replaced by the KC-46 airframe) and the C-17 Globemaster III. If mobilized, the 514 AMW becomes part of the Air Mobility Command at Scott AFB in Illinois. Approximately 2,000 people are assigned to the 514 AMW.

108th Wing (108 WG), New Jersey Air National Guard

The **108 WG, New Jersey Air National Guard,** fulfills numerous missions at JB MDL, and its service to the state and nation is diverse. Eight KC-135R Stratotankers assigned to the 141st Air Refueling Squadron are one part of 108 WG's mission, along with three relatively new units: the 204th Intelligence Squadron, the 150th Special Operations Squadron, and the 140th Cyber Operations Squadron. The 150th Special Operations Squadron, operating the C-32, provides a dedicated rapid response airlift to the DoD in support of US government crisis response to events abroad and domestically. The 204th Intelligence Squadron supports both the Air Mobility Command and the USAF Expeditionary Center.

Marine Aircraft Group 49 (MAG 49), Marine Corps Reserve

The purpose of **MAG 49** is to augment and reinforce the active component with trained units and individual Marines as a sustainable and ready operational reserve. Flying units under MAG 49 homebased at JB MDL include the following:

Marine Heavy Helicopter Squadron 772: Flies the CH-53 Sea Stallion heavy lift helicopter, which provides heavy lift assault support for the full range of military operations, expeditionary maneuver warfare, and operational maneuver from the sea.

Marine Light/Attack Helicopter Squadron 773 Detachment B: Flies the AH-1Z Viper attack helicopter and UH-1 Venom utility helicopter, which perform Marine Corps aviation missions in support of ground operations, including close air support, deep air support, surface escort, air escort, and reconnaissance.

An additional support squadron at MAG 49 has trucks and other vehicles, but no helicopters.

Fleet Logistics Squadron 64 (VR-64)

The Condors of **VR-64** are part of a team that executes effective, safe response via C-130 Hercules air logistics missions in direct support of fleet and combatant commanders worldwide.

2-228th Aviation Regiment (Army Reserve Aviation Command)

The 2-**228th Aviation Regiment** is one of the two fixed-wing battalions in the entire Army Reserve. This aviation regiment stands ready to deploy to a specified theater of operations to execute fixed-wing aviation operations and mission command in support of the combatant commander. The 2-228th Aviation Regiment operates C-12 and Citation aircraft at JB MDL.

JB MLD Range

Army Support Activity (ASA)

The **ASA** engages, integrates, and delivers base support and sustainment of Army mission assets on JB MDL and Devens Reserve Forces Training Area in order to enable Army units and partners to sustain directed levels of readiness. Upon order, ASA can activate and perform as a primary mobilization force generation installation in support of deploying units sourced for combatant command requirements for Army Reserve Command.

Although several other tenants utilize JB MDL – Dix for live-fire range training and other field training, all range activities are coordinated with ASA.

JB MDL – Lakehurst

Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR), US Army

C5ISR is an applied research and development center whose mission is to develop and integrate C5ISR technologies that enable information dominance and decisive lethality for the networked soldier. It has the vision to be the DoD leader in C5ISR systems engineering and technology development. They provide the technical expertise and operational awareness and understanding to develop, engineer, and foresee essential Army needs in mission command and intelligence technologies, applications, and networks. State-of-the-art equipment such as night vision goggles, satellite technology providing friendly and enemy target recognition, and enhanced audio and visual wireless, were all developed by C5ISR to enhance soldier capabilities in the field. C5ISR was formerly known as the Communications-Electronic Research, Development, and Engineering Center.

1st Assault Helicopter Battalion, 150th Aviation Regiment (1-150th), New Jersey Army National Guard Aviation Unit

The three primary missions of the **New Jersey Army National Guard Aviation Unit** are: **(1)** to prepare its units and their soldiers for the execution of their federal wartime mission; **(2)** to prepare for their mission in support of civil authorities; and **(3)** to support community revitalization and nation-building through counter-narcotic operations, environmental initiatives, and youth programs. The 1-150th 1st Assault Helicopter Battalion prepares its units and soldiers for their federal wartime mission and operates UH-60 Blackhawk helicopters.

Naval Air Systems Command's (NAVAIR's) Naval Air Warfare Center Aircraft Division (NAWCAD)

NAVAIR's NAWCAD is the Navy's engineering support activity for aircraft launch and recovery equipment and naval aviation support equipment. As such, NAVAIR's NAWCAD at JB MDL – Lakehurst is the critical link between naval aviation and Navy aircraft carrier strike groups worldwide. NAVAIR's NAWCAD at JB MDL – Lakehurst is responsible for maintaining fleet support and infusing modern technology across the entire spectrum of equipment needed to launch, land, and maintain aircraft from ships at sea.

Department of Justice/ Federal Bureau of Investigation

The **Federal Bureau of Investigation (FBI),** under the Department of Justice, is the domestic intelligence and security service of the United States. At JB MDL – Lakehurst, the FBI field office operates an aviation unit to support investigations in the region.

2.5 AIRFIELD ENVIRONMENT

As noted in **Section 2.1,** JB MDL is one contiguous installation that consists of three former DoD installations that were combined in October 2009. Although JB MDL is a single entity, operations are conducted in distinct areas, including JB MDL – McGuire, JB MDL – Dix, and JB MDL – Lakehurst, which are discussed individually below.

2.5.1 JB MDL – McGuire

Located on the western side of the installation, JB MDL – McGuire **(Figure 2-2)** includes, but is not limited to, aircraft hangars for maintenance and storage, aircraft parking ramps and taxiways, two hard surface runways, assorted office buildings, and support facilities. The airfield's two runways are oriented to a magnetic heading. The main runway, Runway 06/24, is a northeast-southwest runway; it faces southwest on a heading of 240°, and the opposite end faces northeast on a heading of 060°. Runway 06/24 is a 150-foot-wide by 10,014-foot-long Class B runway. The airfield identifier for JB MDL – McGuire is KWRI in the published Flight Information Publication (FLIP).

> A runway is typically used in both directions and counted as two separate runways, depending on the direction of the departure. Each direction is labeled as a separate runway and numbered based on its magnetic heading, divided by 10 and rounded to a whole number. Parallel runways have the same heading and are distinguished by the suffix "L" for 'left,' "C" for 'center,' and "R" for 'right,' as applicable.

Runway 18/36 is the crosswind runway (oriented roughly north-south); it faces north on a heading of 360,° and the opposite end faces south on a heading of 180.° Runway 18/36 is a 150-foot-wide by 7,126-foot-long where JB MDL follows Class A runway criteria to preserve ramp parking capacity. (Note that although Runway 18/36 has Class A runway criteria applied internal to the installation, it is maintained as a Class B runway for APZ planning purposes; **see Section 5.1** for additional details.)

Figure 2-2 JB MDL McGuire Airfield Diagram

Operational, airspace safety, and environmental constraints, as well as a variety of other factors, determine runway utilization **(discussed in Section 3.5).** For example, the Air Force must comply with Federal Aviation Administration (FAA) opposite direction operations policy that applies to the use of one runway for two-directional traffic.

JB MDL – McGuire also supports helicopter operations on both runways and along various taxiways, including arrivals, departures, and pattern operations. Helicopters operating out of JB MDL – McGuire may also utilize JB MDL – Dix or other off-installation locations for maneuvers.

2.5.2 JB MDL – Dix

Centrally located on JB MDL, JB MDL – Dix **(Figure 2-3)** supports a variety of training exercises and activities. JB MDL – Dix has numerous different drop and landing zones, weapons marksmanship and live fire ranges/facilities, and non-live fire facilities. Overall, there are 17 administrative landing zones and 17 tactical landing zones. Live-fire training activities include small arms and large caliber weapons and explosives, all of which generate noise and therefore are addressed by this AICUZ Study update in **Section 3.6.** These activities include training ranges and facilities for active duty, reserve, and National Guard forces associated with all four services, as well as non-military users (i.e., the FBI and New York City Police Department).

2.5.3 JB MDL – Lakehurst (Maxfield Airfield and Test Site Complex)

Located on the eastern side of the installation, JB MDL – Lakehurst (including Maxfield Airfield and the Test Site Complex **[Figure 2-4])** includes aircraft hangars for maintenance and storage, aircraft parking ramps and taxiways, multiple hard surface runways, assorted office buildings, and support facilities. The airfield, referred to as Maxfield Field, consists of two main runways oriented to a magnetic heading. Runway 06/24 is a northeast-southwest runway; it faces southwest on a heading of 240°, and the opposite end faces northeast on a heading of 060°. Runway 06/24 is a 150-foot-wide and 5,002-foot-long Class A runway. Runway 15/33 is the crosswind runway (oriented northwest-southeast); it faces northwest on a heading of 330°, and the opposite end faces southeast on a heading of 150°. Runway 15/33 is a 150-foot-wide by 5,001-foot-long Class A runway. The airfield identifier for JB MDL – Lakehurst (Maxfield Field) is KNEL in the FLIP.

In addition, to the two main runways, there are other airfield facilities utilized for specific training and testing activities at JB MDL – Lakehurst, including:

- **The ALZ, or "Assault Strip,"** which is a shorter runway (90 feet wide by 3,500 feet long) immediately northwest and parallel to Runway 06/24, utilized for simulating tactical aircraft operations with short takeoffs and landings, primarily for the C-17 Globemaster aircraft;
- **Test Strip 12/30,** which is utilized for Field Carrier Landing Practice (FCLP) patterns and equipped with arresting gear and catapult launching capabilities to simulate aircraft operations on a carrier;
- **Multiple helipad locations;** and
- **The Jet Car Track Site,** which comprises five tracks ranging in length from 1.25 to 1.5 miles, is where "dead loads" of between 10,000 and 100,000 pounds are propelled down the tracks at up to 280 miles per hour (mph) by jet engines. The purpose of this system is to test the functionality of aircraft arresting systems for use on aircraft carriers.

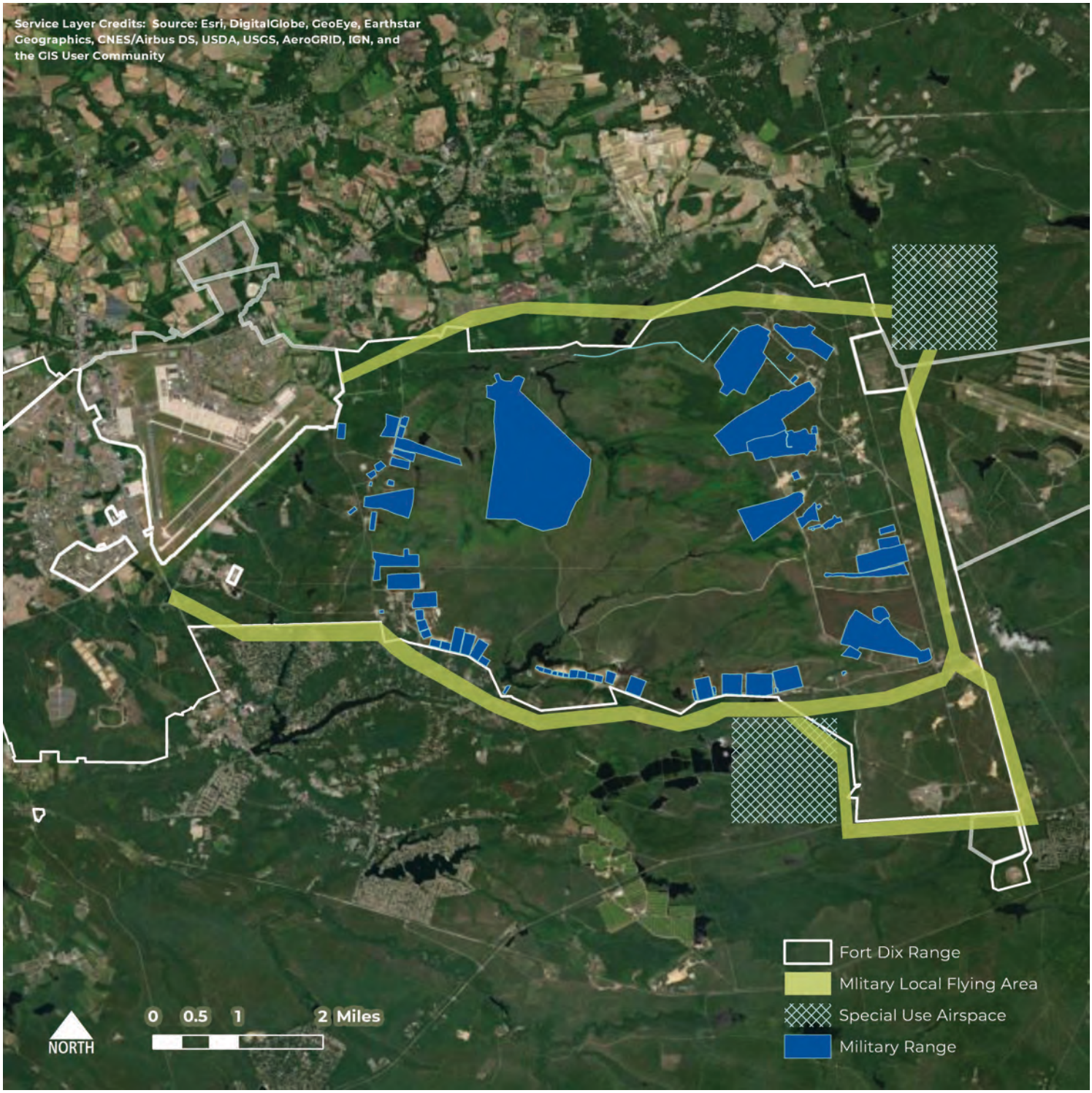


Figure 2-3 JB MDL – Dix Diagram

Figure 2-4 JB MDL – Lakehurst – Airfield Diagram

2.6 LOCAL ECONOMIC IMPACTS

The military provides direct, indirect, and induced economic benefits to local communities through jobs and wages. Benefits include employment opportunities and increases in local business revenue, property sales, and tax revenue. JB MDL is the largest DoD employer in the State of New Jersey, providing well-paying jobs and economic stability that creates demand for goods and services, and supports local businesses and the local economy through household spending.

The 87th Comptroller Squadron at JB MDL conducted an economic impact analysis for Fiscal Year 2018, which covered the operating and construction expenditures of the installation. The analysis quantified the economic impact for the State of New Jersey and, in particular, the three-county area surrounding the installation—Burlington, Ocean, and Monmouth counties. Overall, the estimated annual economic impact of JB MDL was $4.8 billion (87th Comptroller Squadron, 2019).

This figure includes operational expenditures such as payroll of active duty, reserve, and guard military members of five branches, as well as civilian payroll. In addition, operational expenditures included costs of utilities, supplies, services, and construction. Table 2-1 outlines these expenditures in further detail.

The military further contributes to the economic development of communities through demand for local goods and services, and household spending by military and civilian employees, oftentimes referred to as indirect and induced impacts, which were also accounted for within the economic impact analysis. These impacts were calculated using an economic impact model developed by the assistant secretary of the Air Force for financial management and utilized multipliers from the US Department of Commerce and the Bureau of Economic Analysis.

Table 2-1 Summary of Payroll, Construction, Contracts, and Expenditures for Materials, Equipment and Supplies (Millions of Dollars)

Expense Category	Direct Fy18 Data	Indirect Impact	Total Impact
Payroll	$1,050,160,377	$1,246,120,303	$2,296,280,680
Construction	$62,404,500	$56,494,794	$118,899,294
Locally Produced Goods and Services (Non-Construction)	$95,427,913	$80,465,738	$175,893,651
Goods and Services Produced Elsewhere	$492,226,043	$400,409,904	$892,635,947
Other Spending (Tdy/Travel)	$167,347,874	$148,915,544	$316,263,418
Sub Total	**$1,867,566,707**	**$1,932,406,283**	**$3,799,972,990**
Military Retirees	$1,040,000,000	—	$1,040,000,000
Grand Total	**$2,907,566,707**	**—**	**$4,839,972,990**

Source: 87th Comptroller Squadron, Economic Impact Analysis—Operating Expenditures of Joint Base McGuire-Dix-Lakehurst for Fiscal Year 2018, May 2019.


WELLS FARGO


AMC
McGUIRE

3. AIRCRAFT OPERATIONS

Aircraft operations are the primary source of noise associated with a military air installation. The level of noise exposure relates to a number of variables, including the aircraft type, engine power setting and afterburner use, altitude flown, direction of the aircraft, flight track, temperature, relative humidity, frequency, and time of operation (day/night). This chapter discusses the aircraft based at or transient to JB MDL, the types and number of operations conducted at the airfields, and the runways and flight tracks used to conduct the operations.

3.1 AIRCRAFT TYPES

There are two primary types of aircraft operating at JB MDL: fixed-wing and rotary-wing (helicopters). Aircraft permanently based at JB MDL are the most common aircraft conducting flight operations at the installation. Aircraft that are not permanently assigned to the installation but conduct operations from the installation on an occasional basis are referred to as “transient” aircraft. Below are brief descriptions of assigned aircraft and the most common transient aircraft at JB MDL.

3.1.1 Permanently Assigned Aircraft at JB MDL

The majority of the permanently assigned aircraft are noted below for both JB MDL – McGuire and JB MDL – Lakehurst. Many of the aircraft that are permanently assigned to one airfield oftentimes operate at both airfields; therefore, these aircraft descriptions are combined for all of JB MDL.

It should be noted that the Air Force is transitioning from the KC-10, which has been a mainstay at JB MDL for years, to the KC-46A. This AICUZ Study presents the aircraft operational data and noise contours of the transition between these two aircraft; therefore, the KC-46A is presented in this section, and the KC-10 has been omitted.

KC-46A

The KC-46A is powered by two Pratt & Whitney 4062 engines (thrust reversers removed). Each engine has the capability to provide approximately 62,000 pounds of thrust. With new technology and a maximum fuel capacity expected to be 212,000 pounds, the KC-46A is capable of accomplishing all current aerial refueling missions. The KC-46A will be able to refuel any certified fixed-wing receiver-capable aircraft on any mission, both day and night. The aircraft will be equipped with a modernized KC-10 refueling boom integrated with a proven fly-by-wire control system and will have the ability to deliver fuel through a centerline hose and drogue system, which adds additional mission capability independent of the boom system. The aircraft will be able to operate at certain night vision goggle (NVG) and/or defensive system-required airfields with a minimum of 7,000 feet of paved runway available for takeoff or landing. The aircraft will be capable of operating in day-night and adverse weather conditions over vast distances to enable deployment, employment, sustainment, and redeployment of US, joint, allied, and coalition forces.

KC-135R

The KC-135R Stratotanker is a medium-range tanker aircraft capable of cargo and AE support. The KC-135 has been the mainstay of the Air Force tanker fleet for approximately 50 years. It is similar in size and appearance to commercial 707 aircraft but is designed to military specifications. This unique asset enhances the Air Force's capability to accomplish its primary mission of global reach. It also provides aerial refueling support to Air Force, Navy, Marine Corps, and allied nation aircraft. The KC-135 is capable of transporting litter and ambulatory patients using patient support pallets during aeromedical evacuations.

C-17

The C-17 Globemaster III is the most flexible cargo aircraft to enter the airlift force. The C-17 is capable of rapid strategic delivery of troops and all types of cargo to main operating bases or directly to forward bases in the deployment area. The aircraft can perform tactical airlift and airdrop missions and can transport litters and ambulatory patients during aeromedical evacuations. The inherent flexibility and performance of the C-17 force improve the ability of the total airlift system to fulfill the worldwide air mobility requirements of the United States.

C-32

The C-32 is a specially configured version of the Boeing 757-200 commercial intercontinental airliner. The C-32 body is identical to that of the Boeing 757-200 but has different interior furnishings and 21st century avionics. It primarily provides safe, comfortable, and reliable transportation for our nation's leaders to locations around the world.

CH-53E

The CH-53 helicopters are a family of medium – and heavy-lift helicopters used by the Marine Corps, including the CH-53E Super Stallion at JB MDL. The CH-53E is a heavy-lift helicopter used for the transportation of materials and supplies and is compatible with most amphibious class ships. It is capable of transporting 30 passengers and has a center external hook as well as dual fore and aft point hook systems for carrying external loads safely at higher airspeeds.

AH-1Z/UH-1Y

The AH-1Z is an attack helicopter capable of operating day or night and in marginal weather. It provides fire support and security for ground forces, as well as anti-helicopter support, armed escort, and visual reconnaissance, among other missions. The UH-1 utility helicopter provides command and control and assault support under day and night conditions, as well as under adverse weather conditions. The two helicopters are both out of the H-1 Upgrade Program and share many identical parts, allowing for easier maintenance.

C-130

The C-130 Hercules primarily performs the tactical portion of the airlift mission. The aircraft is capable of operating from rough, dirt strips and is the prime transport aircraft for airdropping troops and equipment into hostile areas. The C-130 operates throughout the Air Force and Navy, serving with Air Mobility Command, Air Force Special Operations Command, Air Combat Command, U.S. Air Forces in Europe, Pacific Air Forces, Air National Guard, and the Air Force Reserve Command, fulfilling a wide range of operational missions in both peace and war situations. Basic and specialized versions of the aircraft airframe perform a diverse number of roles, including airlift support, Antarctic ice resupply, aeromedical missions, weather reconnaissance, aerial spray missions, firefighting duties for the U.S. Forest Service, and natural disaster relief missions.

C-12

The C-12 Huron is a military version of an executive passenger and transport aircraft based on the Beech Model 200 Super King Air. The C-12 Huron is a twin turboprop aircraft used for cargo and passenger airlift. The aircraft can carry 19 passengers or up to 3,500 pounds of cargo. It is used by the Air Force and other DoD branches for several functions, including range clearance, embassy support, medical evacuation, very important person transport, and passenger and light cargo transport.

UH-60 / SH-60

The UH-60 Black Hawk is the Army's front-line utility helicopter used for air assault, air cavalry, and aeromedical evacuation units. It is designed to carry 11 combat-loaded air assault troops and is capable of transporting a 105-millimeter howitzer and 30 rounds of ammunition. First deployed in 1978, the Black Hawk's advanced technology makes it easy to maintain in the field. The Black Hawk has performed admirably in a variety of missions, including air assault, air cavalry, and aeromedical evacuations. Modified Black Hawks also operate as command and control, electronic warfare, and special operations platforms. The SH-60 Seahawk is the Navy's multi-mission helicopter based on the UH-60.

3.1.2 Transient Aircraft at JB MDL

Transient aircraft at JB MDL include fixed-wing and rotary-wing aircraft belonging to multiple military branches. Common transient aircraft include transport and refueling aircraft, and the occasional fighter aircraft. Many of the transient aircraft types are identical to the based aircraft at JB MDL described above (e.g., C-17s, C-130s, and KC-135s), but are visiting from other installations.

C-5M

The C-5M Super Galaxy is a large, strategic military transport aircraft and is the largest aircraft in the Air Force inventory. Its primary mission is to transport cargo and personnel for the DoD. It occasionally utilizes JB MDL – McGuire.

B-747

The Boeing 747 (B-747) is a large, long-range, wide-bodied aircraft that occasionally flies out of JB MDL – McGuire. This civilian aircraft is used for cargo transport of goods typically associated with activities of the 305th Aerial Port Squadron.

F/A-18 E/F

The F/A-18 E/F Super Hornet is an all-weather aircraft, used as both an attack and fighter aircraft. In its fighter mode, the F/A-18 E/F is used for fighter escort and fleet air defense. In its attack mode, the aircraft is used for force projection, interdiction, and close and deep air support. As the nation's first strike-fighter, the F/A-18 E/F was designed with excellent fighter and self-defense capabilities to increase strike mission survivability.

Other civilian aircraft types that may utilize JB MDL – McGuire occasionally include KC-46s, F-16s, B-737s, B-757s, and the Douglas DC-8 for transport of cargo and/or personnel.

3.2 MAINTENANCE OPERATIONS

Maintenance is an integral part of any flying operation and requires a dedicated team of professionals to ensure that units can meet their flying requirements. Two key tasks in maintaining aircraft are low – and high-powered engine maintenance runs. JB MDL may conduct low-power engine maintenance runs at either JB MDL – McGuire or JB MDL – Lakehurst on aprons or ramps, or in hangars to functionally check the operation of engines or other aircraft systems.

Aircraft maintainers may conduct engine maintenance runs at power settings ranging from idle to maximum power. Maintainers typically conduct low – to mid-range-powered engine maintenance runs on aircraft parking ramps or just outside of maintenance hangars. Operational noise generated from aircraft maintenance is included in the JB MDL noise contours.

There are no specified restrictions on maintenance operations; however, there will occasionally be designated quiet hours during on-base events as specified in the airfield operations manual.

3.3 FLIGHT OPERATIONS

Flight activities, including where aircraft fly, how high they fly, how many times they fly over a given area, and the time of day they operate, must be fully evaluated to understand the relationship between flight operations and land use. This chapter discusses typical flight operations for aircraft based at or visiting JB MDL.

Each time an aircraft crosses over a runway threshold (the beginning or ending of a runway's useable surface) to either take off, practice an approach, or land, it is counted as a single flight operation. For example, a departure counts as a single flight operation, as does an arrival. As another example, when an aircraft conducts a pattern (a departure followed by an immediate return) it counts as two flight operations because the aircraft crosses both the approach and departure ends of the runway during the pattern.

This AICUZ Study considers operations from any of the airfields at JB MDL, occurring at both JB MDL – McGuire as well as at JB MDL – Lakehurst. JB MDL operations include both base assigned and transient military fixed-wing and rotary-wing aircraft.

The following list highlights typical operations utilized during normal or increased flight operations. Each flight track utilized is designed to maximize flight operations and, when possible, minimize the effects of noise.

Takeoff: When a pilot positions an aircraft on the runway and the engine power is set to facilitate movement and eventual flight.

Departure: An aircraft that has been cleared for takeoff, for the purpose of air traffic sequencing, separation, noise abatement, compliance with avoidance areas, and overall safety of flight, should follow specific ground tracks and altitude restrictions as they depart the airfield's immediate airspace.

Straight-In Arrival: An aircraft performing a straight-in arrival aligns with the runway extended centerline and begins a gradual descent for landing. This type of approach enables an aircraft to maintain a smooth, stable, and steady approach and requires no additional maneuvering.

Tactical Arrival/Departure (TAD): Aircraft stationed at JB MDL (specifically JB MDL – McGuire) practice non-standard arrivals and departures, known as Tactical Arrival/Departure, or TAD procedures, on a regular basis. Aircraft such as C-17s, KC-46s, and KC-135s conduct TAD procedures at JB MDL. JB MDL – McGuire aircrews practice these maneuvers to prepare for operations into high-threat environments overseas. The maneuvers are designed to minimize exposure of the aircraft to various threats on the ground. Aircrews conducing TAD procedures operate under Visual Flight Rules (VFR) and include maneuvers in which the aircraft flies a spiraling maneuver either up or down at a high rate of ascent/descent.

Pattern Work: Pattern work refers to traffic pattern training in which the pilot performs takeoffs and landings in quick succession by taking off, flying the pattern, and then landing. A closed pattern consists of two portions, a takeoff/departure and an approach/landing; a complete closed pattern is counted as two flight operations because the aircraft crosses over a runway threshold twice, once on departure and once on arrival. Traffic pattern training is demanding and utilizes all of the basic flying maneuvers a pilot learns—takeoffs, climbs, turns, climbing turns, descents, descending turns, and straight and level landings.

- **Low Approach:** A low approach is an approach to a runway that does not result in a landing but rather a descent toward the runway (usually below 500 feet above ground level [AGL]) followed by a climb out away from the airfield. Pilots perform low approaches for a number of reasons, including practicing to avoid potential ground obstructions (e.g., vehicles, debris, stray animals).
- **Touch-and-Go (T&G):** A T&G landing pattern is a training maneuver that involves landing on a runway and taking off again without coming to a full stop. Usually, the pilot then circles the airfield in a defined pattern, known as a circuit, and repeats the maneuver.
- **Circling Approach:** A circling approach is an extension of an instrument approach procedure which provides for visual circling prior to landing. It is the visual phase of an instrument approach to bring an aircraft into position for landing on a runway which is not suitably located for a straight-in approach.
- **Precision Approach RADAR (PAR) Approach:** Primary radar equipment used to determine the position of an aircraft during final approach, in terms of lateral and vertical deviations relative to an aircraft's approach path. PAR approaches are used by pilots in order to receive radio transmitted guidance from air traffic controllers for their entire approach segment.

Instrument Approach: Instrument approaches performed with active assistance from ATC during poor weather conditions. ATC personnel direct the aircraft toward the runway centerline. Once established on the centerline, pilots use aircraft instruments to maintain runway alignment and adherence to altitude restrictions until the pilot is able to acquire visual sight of the runway environment. Pilots often practice this type of approach to maintain proficiency.

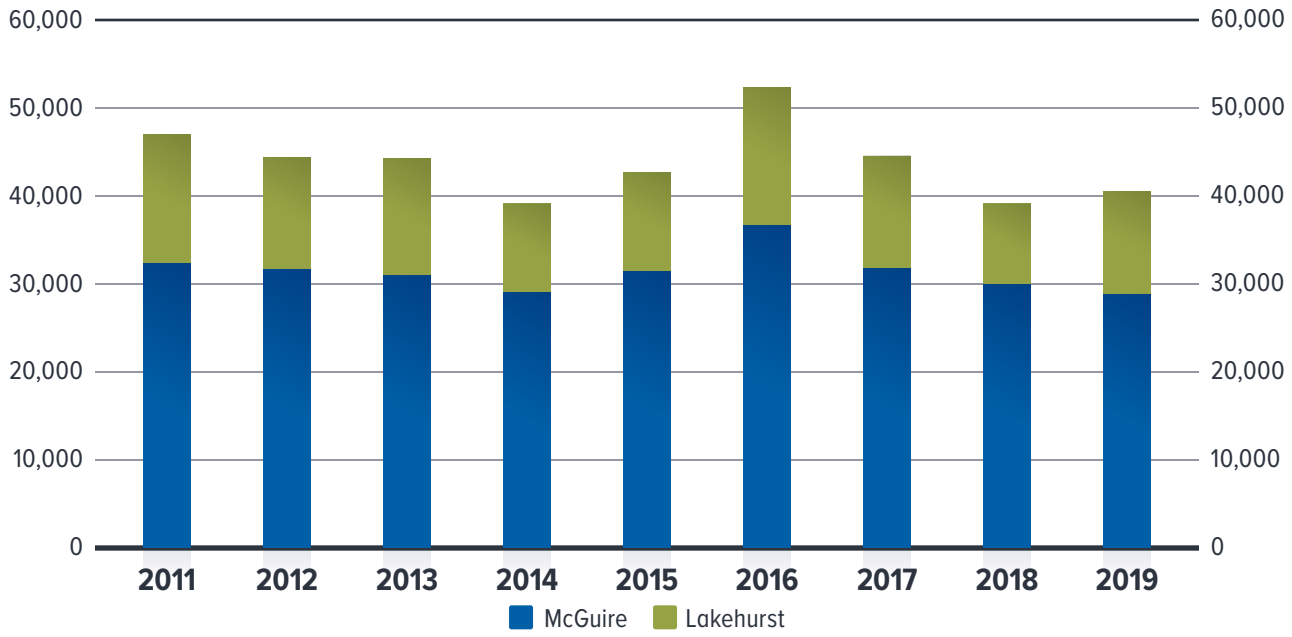
3.4 ANNUAL AIRCRAFT OPERATIONS

Total annual aircraft operations account for each departure and arrival, including those conducted as part of a pattern operation. Figure 3-1 provides the number of aircraft operations that have occurred at JB MDL airfields over a nine-year period, including assigned and transient aircraft using the installation. The historical average over this time period was approximately 43,800 total annual operations for the installation, with slightly more of those operations occurring at JB MDL – McGuire than at JB MDL – Lakehurst.

The projected annual aircraft operations for JB MDL utilized for the planning noise contour used in this 2022 AICUZ Study are 104,216, which is generally comparable to the number of aircraft operations noted in the 2013 AICUZ Study (103,958), but higher than JB MDL's historical average. This total consists of 61,430 operations associated with JB MDL – McGuire and 42,786 operations associated with JB MDL – Lakehurst. The mix of aircraft has changed, due primarily to the transition from the KC-10 to KC-46 aircraft. Operation levels since 2013 have not reached the levels projected in the MOB 4 EIS for the KC-46 beddown. However, utilizing these projected operations numbers at JB MDL allows the base and community to plan for a larger operational footprint which aligns with the Air Force's NEPA projection of JBMDL operations.

The modeling assumptions applied in the previous studies that generated the noise contours being utilized in this AICUZ Study were based upon interviews and historical data and include 57 percent of aircraft operations at JB MDL – McGuire taking place during acoustical daytime (defined as taking place from 7:00 a.m. to 10:00 p.m.) and 43 percent occurring during acoustical nighttime (defined as taking place from 10:00 p.m. to 7:00 a.m.). At JB MDL – Lakehurst, it is estimated that 76 percent of the aircraft operations take place during the daytime, and 24 percent occur during the nighttime.

Figure 3-1 Summary of Flight Operations for Calendar Years (CYs) 2011 to 2019



Source: McGuire ATC 2020, Lakehurst ATC 2020

3.5 RUNWAY UTILIZATION AND FLIGHT TRACKS

3.5.1 Runway Utilization

A variety of factors influence the frequency with which aircraft utilize a runway, including, but not limited to:

- **Airfield environment** (layout, lights, runway length);
- **Direction of prevailing winds;**
- **Location of natural terrain features** (rivers, lakes, mountains, and other features);
- **Wildlife activity;**
- **Number of aircraft in the pattern;** and/or
- Preference of a runway for the **purpose of safety and noise abatement.**

ATC personnel establish the runway in use. Aviation planners adjust the pattern procedures accordingly to maximize air traffic flow efficiency. Table 3-1 lists how frequently each runway at JB MDL is used.

Each runway has designated flight tracks that provide for the safety, consistency, and control of an airfield. Flight tracks depict where aircraft fly in relation to an airfield. They are for departures, arrivals, and pattern work procedures, and are designated for each runway to facilitate operational safety, noise abatement, aircrew consistency, and the efficient flow of air traffic within the ATC tower's controlled airspace. Aircraft flight tracks are not set "highways in the sky." While flight tracks are depicted as narrow lines on a map, they are actually wider bands in practice. Aircraft de-confliction, configuration, pilot technique, takeoff weight, and wind all affect the actual path taken on any given flight.

Due to the large amount of operations occurring at JB MDL, the typical or more commonly used flight tracks are shown in Figures 3-2 through 3-8. These include fixed-wing departure, arrival, pattern, and interfacility flight tracks for both JB MLD – McGuire and JB MLD – Lakehurst.

Table 3-1 Runway Usage and Flight Routing[1]

	Runway Direction	Arrival	Departure	Patterns
JB MDL – McGuire	Runway 06 (arriving from the west and/or departing to the east)	28%	28%	28%
	Runway 24 (arriving from the east and/or departing to the west)	57%	56%	56%
	Runway 18 (arriving from the north and/or departing to the south)	4%	5%	5%
	Runway 36 (arriving from the south and/or departing to the north)	5%	5%	5%
	Main Helipad, North	4%	1%	5%
	Main Helipad, South	1%	4%	2%
JB MDL – Lakehurst	Runway 06 (arriving from the west and/or departing to the east)	2%	3%	13%
	Runway 06, ALZ/Assault Strip	1%	0%	2%
	Runway 24 (arriving from the east and/or departing to the west)	10%	11%	50%
	Runway 24, ALZ/Assault Strip	3%	0%	7%
	Runway 15 (arriving from the north and/or departing to the south)	2%	3%	4%
	Runway 33 (arriving from the south and/or departing to the north)	23%	25%	22%
	Runway 12, Field Carrier Landing Practice Strip	<1%	<1%	<1%
	Runway 30, Field Carrier Landing Practice Strip	<1%	<1%	1%
	Main Helipad, East	17%	2%	0%
	Main Helipad, Southwest	2%	17%	0%
	Secondary Helipad, East	4%	36%	0%
	Secondary Helipad, Southwest	36%	4%	0%

Notes: [1] Some percentages may not total to 100 exactly due to rounding.

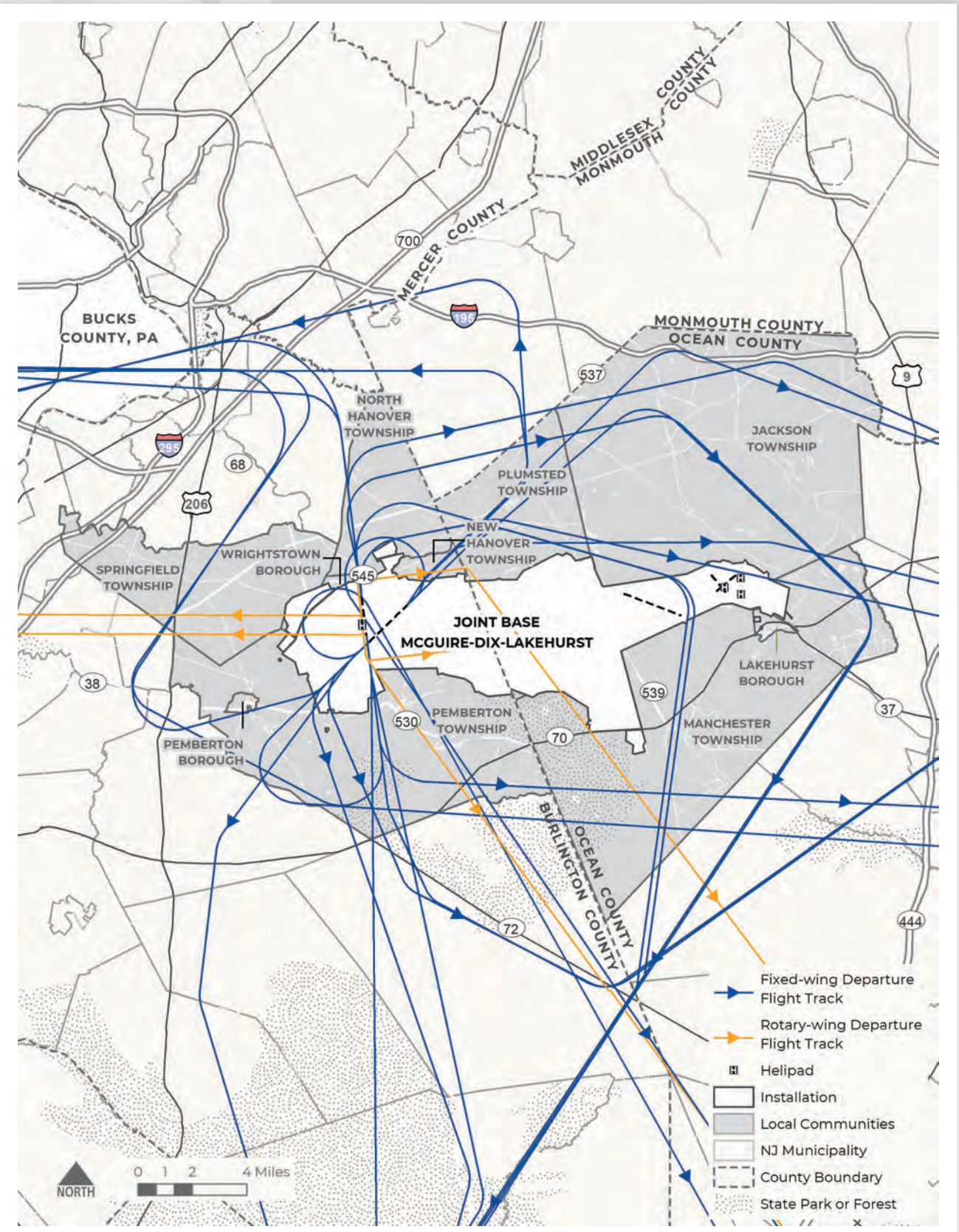


Figure 3-2 **Typical Departure Flight Tracks for JB MDL – McGuire**

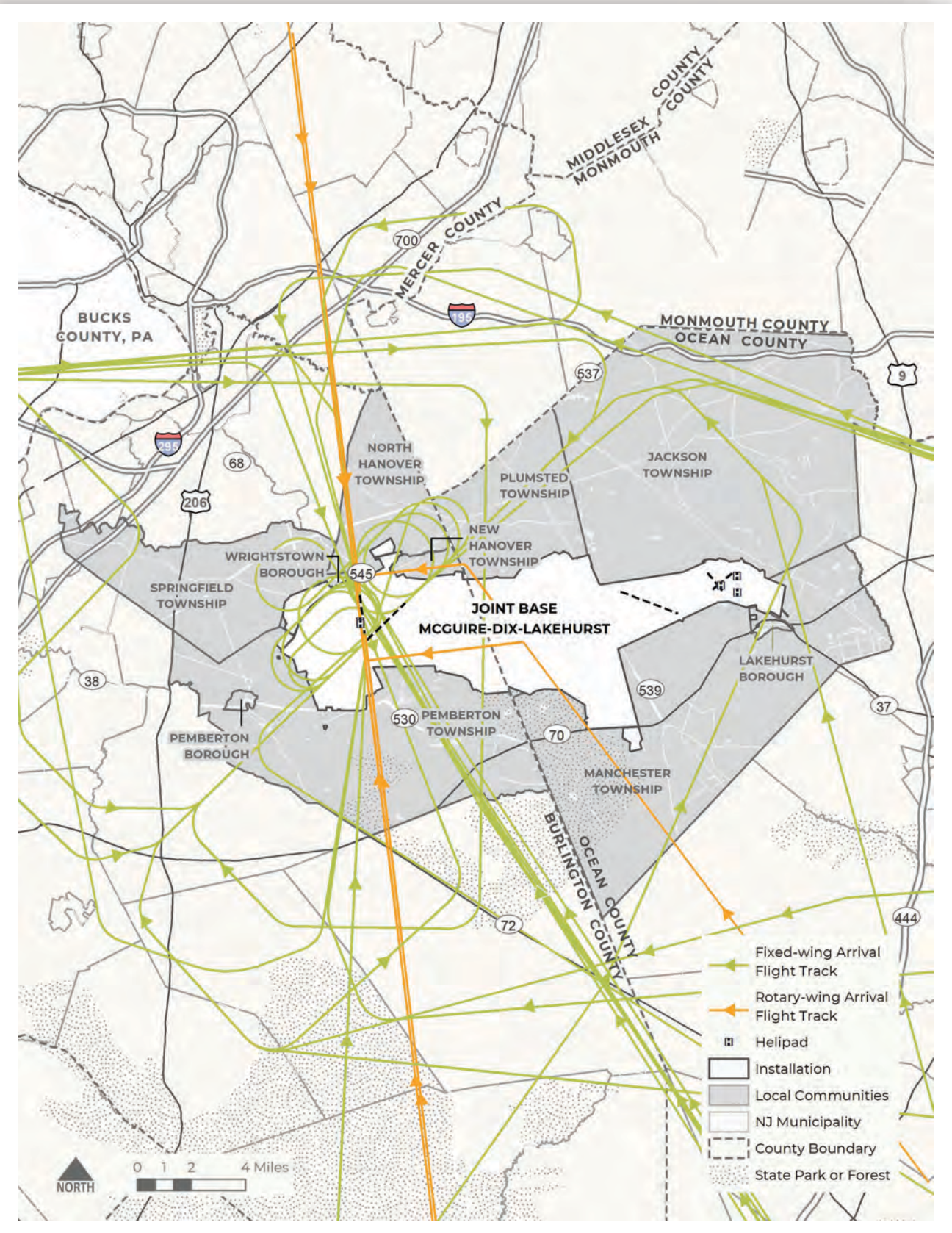


Figure 3-3 Typical Arrival Flight Tracks for JB MDL – McGuire

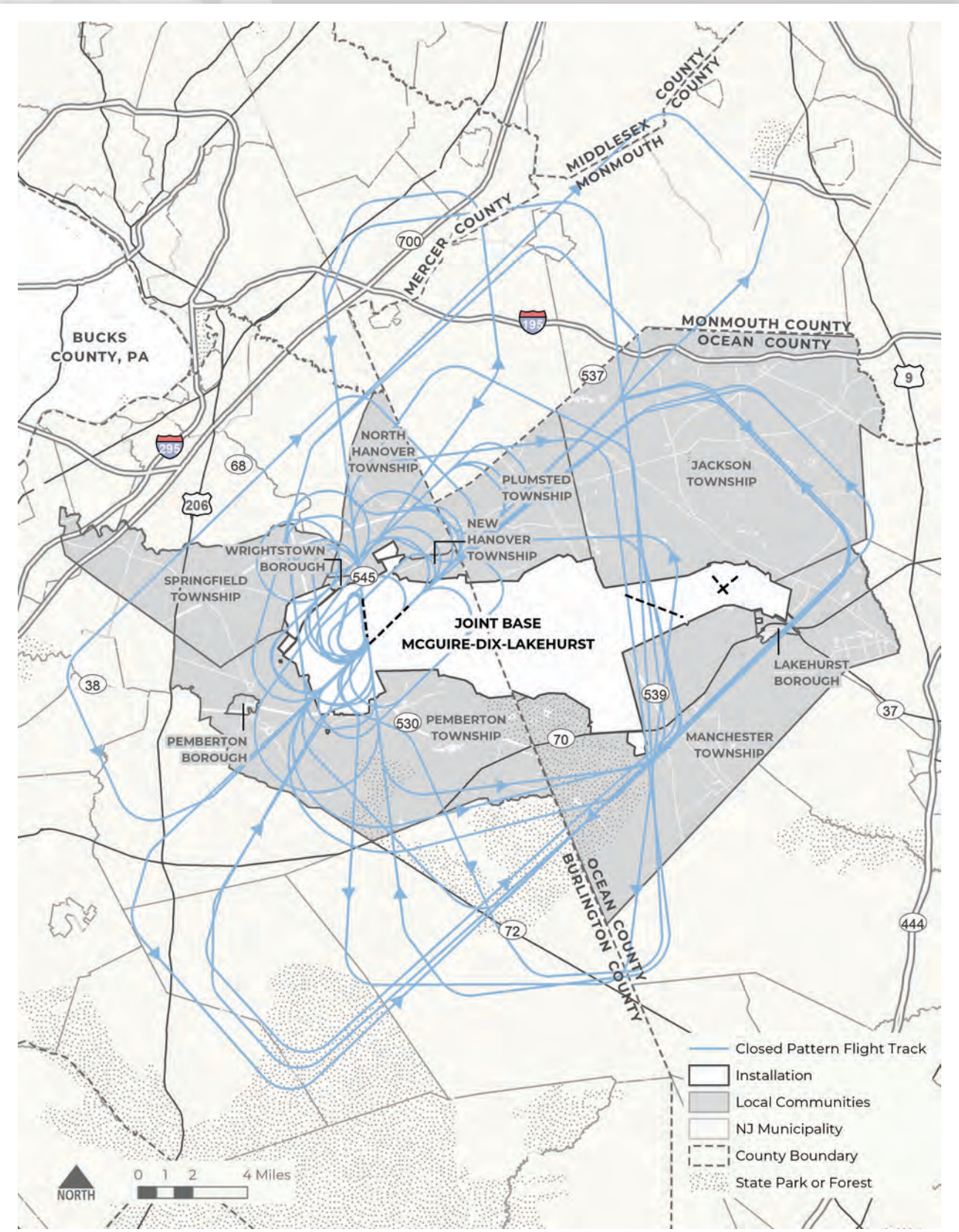


Figure 3-4 **Typical Pattern Flight Tracks for JB MDL – McGuire**

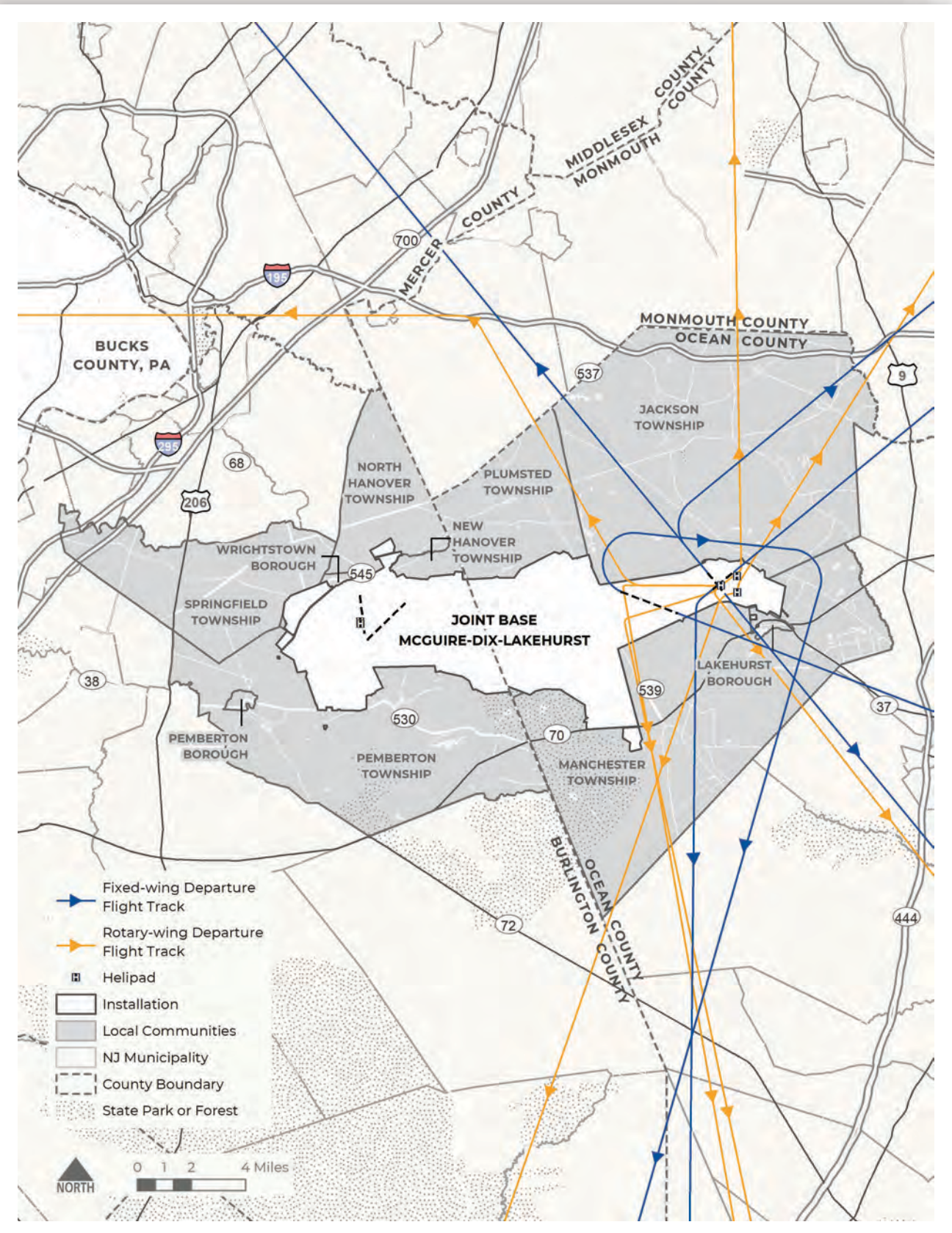


Figure 3-5 **Typical Departure Flight Tracks for JB MDL – Lakehurst**

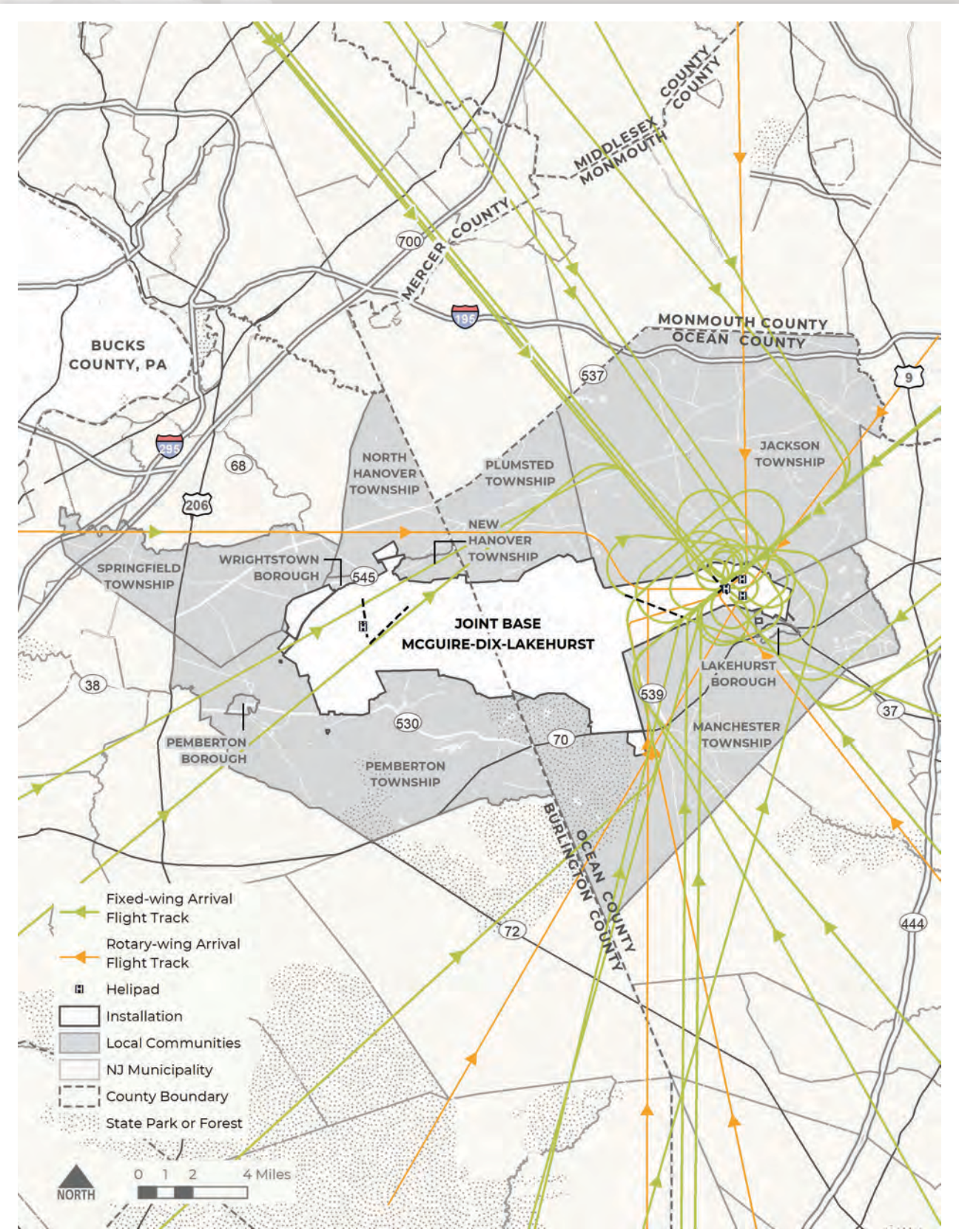


Figure 3-6 Typical Arrival Flight Tracks for JB MDL – Lakehurst

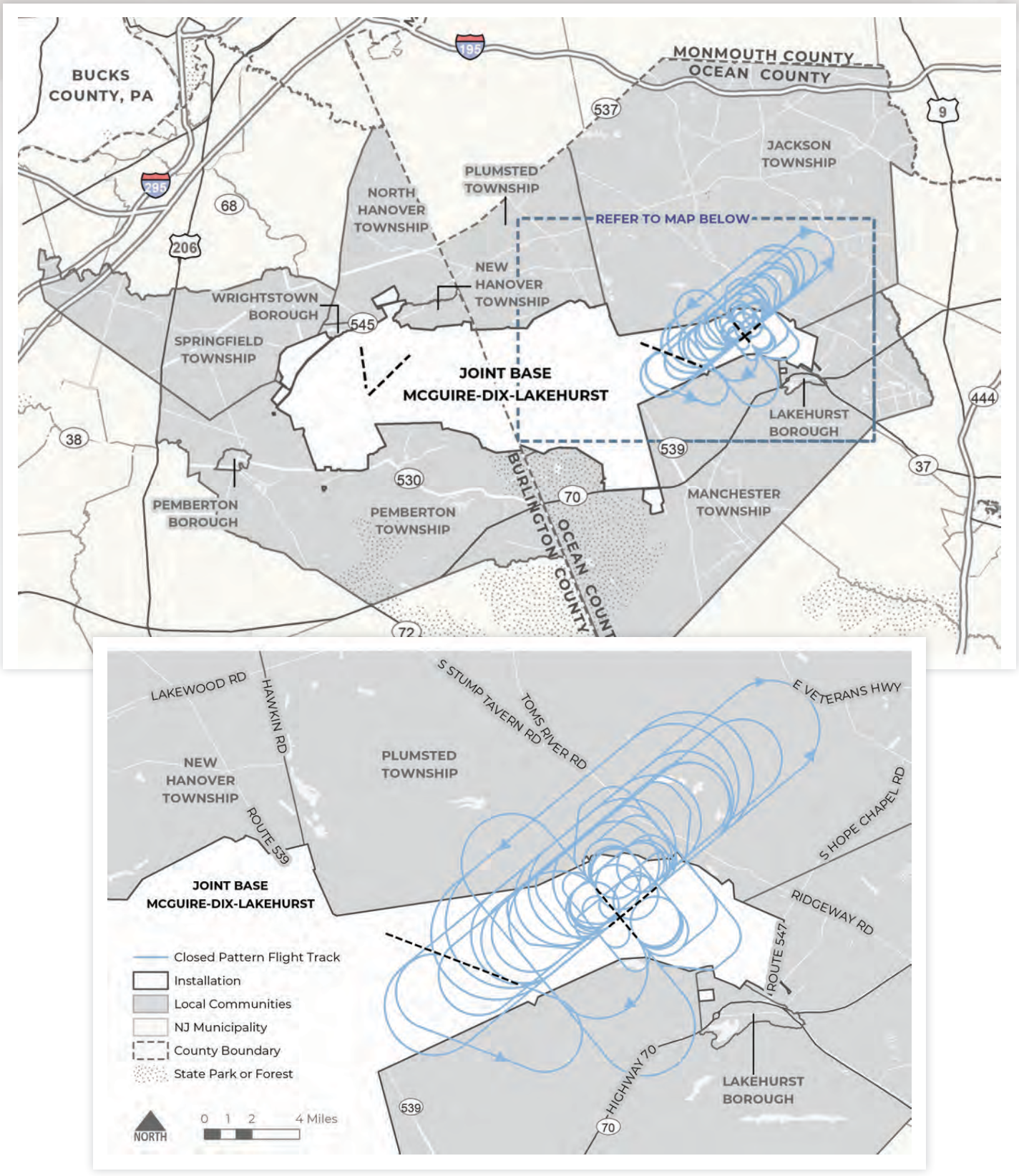


Figure 3-7 Typical Pattern Flight Tracks for JB MDL – Lakehurst

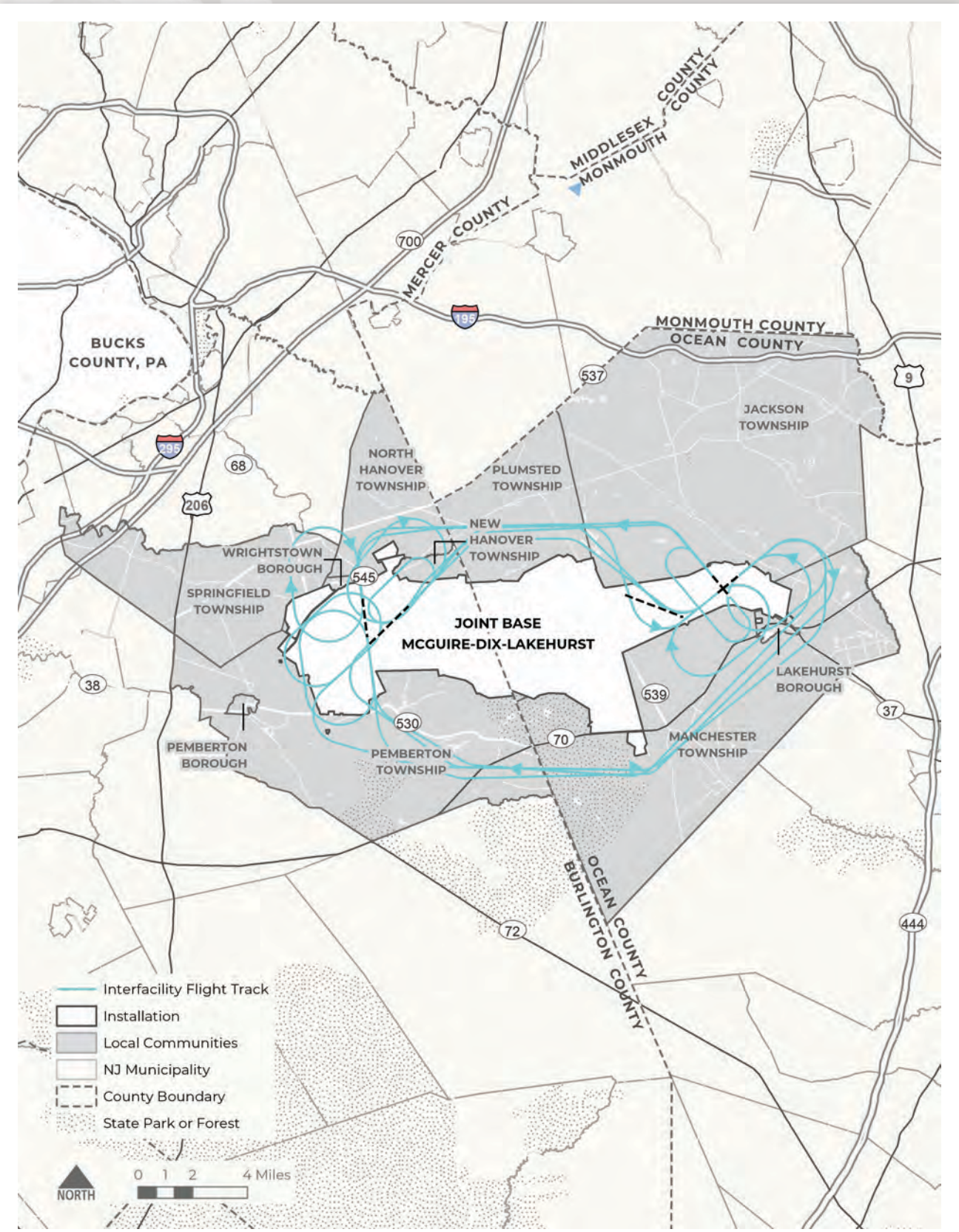


Figure 3-8 Typical Interfacility Flight Tracks for JB MDL

3.6 RANGE OPERATIONS

This 2022 JB MDL AICUZ Study provides general information on range operations, including the use of small arms as well as large-caliber weapons, missiles, and explosives. Based upon interviews with installation personnel, the overall range operations are essentially at capacity and have not changed substantially in several years. In 2012, at the time of data gathering for the previous AICUZ Study, ASA was still conducting mobilizations, which included more fire by machine guns than mortars or artillery, as well as more convoy training. Today, there is more steady-state training without as many surges (with the exception of summer months, when there tends to be more activity). ASA indicated that JB MDL – Dix has certain space constraints from land boundaries and restricted airspace areas, and no significant changes or expansion to the JB MDL – Dix mission and capacity is planned. Therefore, the operations presented in this 2022 JB MDL AICUZ Study are consistent with those modeled in the previous 2013 AICUZ Study, with the major sources of noise and safety zones related to small arms training, large-caliber weapons training, and ground vehicle operations.

The range and impact areas are designed to accommodate small-arms (pistol and shoulder-mounted) weapons, artillery, armor, and rotary-wing (helicopter) aircraft **(depicted previously in Figure 2-3).** Due to space constraints, the range is limited to using slower moving aircraft to avoid overfiring the restricted area. The other training areas that constitute JB MDL – Dix are used for vehicle training, bivouac areas, and training exercises of various kinds. The range complex for light arms, artillery, and helicopter aerial gunnery training is located in the center section of the range and consists of more than 50 live-fire ranges. The layout is circular, with a common impact area in the center at a slightly lower elevation.

The ranges have designated locations or positions for both firing and maneuvering to accommodate differing training requirements, resulting in a high-quality training experience. Each training event or exercise varies according to the weapon system, ammunition type, number of rounds fired, duration of the event, and frequency of the event. There is a wide variety of live fire training missions, depending on the nature of the target and the nature of the operational mission.

3.6.1 Small Arms Training Activities

Small arms range activities are the use of weapons that are .50 caliber or less and include M-16/M-4 rifles, 7.62-mm (millimeter) rifles, 9-mm handguns, M-240 machine guns, .45 caliber handguns, and .50 caliber machine guns. Each of these weapons produces a distinct noise signature when fired. Refer to **Section 4.4.3** for additional details on the small arms activity at JB MDL – Dix in the context of noise modeling.

Night operations are of critical importance in modern warfare. Particularly during summer months, when the sun sets late, required night munitions training sometimes occurs during the late-night hours after 10:00 p.m. and before 7:00 a.m. Historically, it is estimated that less than two-percent of total annual small arms rounds are fired during this time period.

3.6.2 Large-Caliber Weapons Training Activities

Large-caliber weapons include those larger than .50 caliber and any weapons that include explosive charges. At JB MDL – Dix, large-caliber training is conducted with Howitzers (155-mm rounds), mortars (120-mm, 81-mm, and 60-mm rounds), aerial gunnery (2.75-in and 20-mm rounds), mines, missiles, rockets, grenades and grenade launchers, and explosive charges. Refer to **Section 4.4.3** for additional details on the large-caliber activity at JB MDL – Dix in the context of noise modeling.

The majority of the rounds fired at JB MDL – Dix are non-high-explosive (non HE), meaning that they contain only a small spotting charge, are incendiary rounds, or do not detonate at all. HE rounds are designed to destroy a target and contain a substantial amount of explosive material, which detonates at the target. Of the largest/loudest weapons fired (e.g., 155 mm, 120 mm, 81 mm), most rounds are HE. From a noise modeling perspective, the firing noise associated with non-HE rounds is the same as for HE rounds.

Large-caliber weapons training also occasionally occurs at night to prepare for nighttime combat operations. And similar to small arms training, it is estimated that less than two-percent of total large-caliber rounds fired are fired in the late-night time period between 10:00 p.m. and 7:00 a.m.

3.6.3 Ground Vehicle Operations

Typical vehicle usage at JB MDL – Dix consists of passenger vehicles, delivery trucks, and military off – and on-road vehicles. Passenger vehicles make up the majority of vehicles present at roadways on JB MDL – Dix, while larger vehicles such as tractor semi-trailers are used for delivery of large cargo to JB MDL. Military on-road vehicles would consist of vehicles similar to those owned or operated by civilians. Military off-road vehicles would include some on-road vehicles modified for off-road use and wheeled troop transport vehicles such as the high-mobility multi-purpose vehicle and mine-resistant ambush-protected vehicle.

JB MDL has certain designated paved areas within the installation for on-road vehicle training, which include roads with traffic markings, a 30,000-square-foot asphalt pad, and a training area complete with loading docks for tractor semi-trailers **(see Figure 3-9).** Driver Training Areas 2 and 3 are located in the middle of the installation, east of JB MDL – McGuire Runway 06/24. Driver Training Areas 4 and 5 are located within the eastern section of the JB MDL – Dix area, east of Range 61. In addition, there are designated areas for off-road vehicle training that can occur within the boundaries of Ranges 61, 65, and 85.

While the number of vehicles training at JB MDL fluctuates, the limits on the number and speed of vehicles permitted within the training areas would prevent noise levels from vehicle training areas from exceeding the noise associated with large-caliber munitions use and aircraft operations at JB MDL – McGuire and JB MDL – Lakehurst, which are the dominant noise sources at JB MDL.

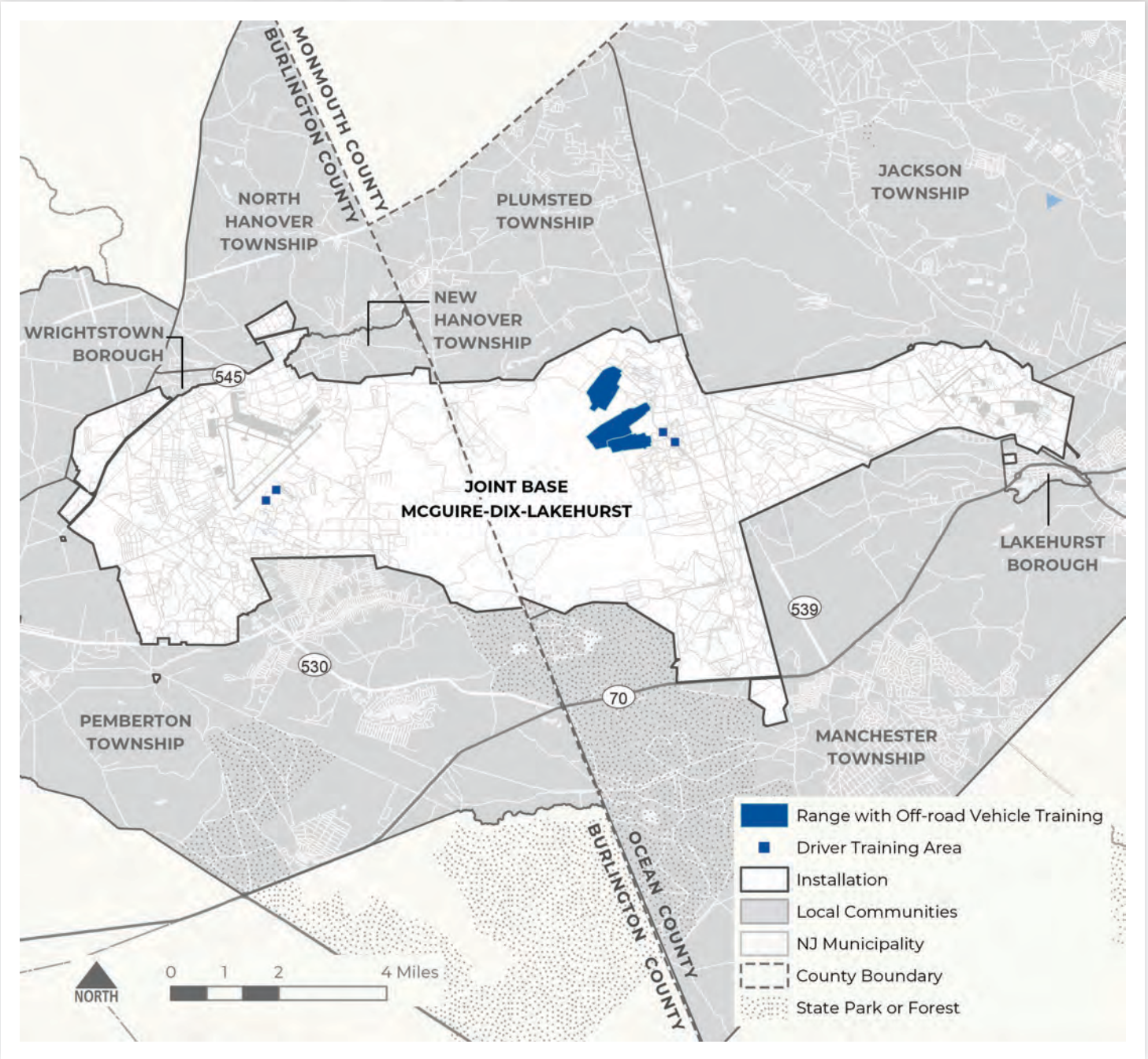


Figure 3-9 On – and Off-Road Vehicle Training Areas, JB MDL – Dix

4. AIRCRAFT NOISE

How an installation manages aircraft noise can play a key role in shaping its relationship with neighboring communities. Ideally, aircraft noise and its management should be key factors in local land use planning. Because noise from aircraft may affect areas around the installation, the Air Force has defined noise zones using the guidance provided in the Air Force Handbook (AFH 32-7084) *The AICUZ Program Manager's Guide.*

> **Terrain features, weather phenomena, man-made structures, and daily life activity contribute to noise exposure.**

While the level of noise produced by aircraft may have a direct effect on communities in proximity to military air installations, other factors also influence the noise impact. An airfield's layout (its buildings, parking ramps, and runways), type of aircraft, natural terrain features, weather phenomena, and daily activities all influence the levels of noise that the community experiences.

4.1 WHAT IS SOUND/NOISE?

Sound consists of vibrations in the air. A multitude of sources can generate these vibrations, including roadway traffic, barking dogs, radios—or aircraft operations. These vibrations are called compression waves. Just as a pebble dropped into a pond generates ripples,

> **Sound becomes noise when it interferes with normal activities.**

the compression waves—formed of air molecules pressed together—radiate out, decreasing with distance. If these vibrations reach your eardrum at a certain rate and intensity, you perceive it as sound. When the sound is unwanted, we refer to it as noise. Generally, sound becomes noise to a listener when it interferes with normal activities. Sound has three components: intensity, frequency, and duration, as described below.

Intensity, or loudness, relates to sound pressure change. As the vibrations oscillate back and forth, they create a change in pressure on the eardrum. The greater the sound pressure change, the louder the sound seems.

Frequency determines how people perceive the pitch of the sound. Low frequency sounds are characterized as rumbles or roars, while sirens or screeches typify high-frequency sounds. Sound frequency is measured in cycles per second, or hertz (Hz). While human hearing ranges extend from 20 to 20,000 Hz, people hear best in the range of 1,000 to 4,000 Hz. For environmental noise, A-weighting, which focuses on this range, is used to best represent human hearing. A-weighted decibels are abbreviated as "dBA," but if it is the only weighting being discussed, the "A" is generally dropped.

Duration is the length of time one can detect the sound.

4.2 HOW SOUND IS PERCEIVED

The loudest sounds that the human ear can comfortably hear are a billion times higher in intensity than those of sounds we can barely hear. Because such large numbers become awkward to use, noise is measured in decibels (dB), which uses a logarithmic scale.

Figure 4-1 is a chart of A-weighted sound levels from common sources. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB can cause discomfort inside the ear, while sound levels above 130 dB are painful.

Table 4-1 shows the subjective responses with change in sound level for a single event. While noise energy doubles or halves with every 3-dB change, people do not perceive all this noise energy. It takes a 10-dB increase or decrease for people to perceive a doubling or halving of loudness.

The noise environment at JB MDL includes two different types of noise sources that can be classified as continuous or impulsive. Continuous noise refers to noise events that have a gradual onset, such as an aircraft taking off, and not necessarily noise that is occurring at a constant level at all times. Continuous noise is associated

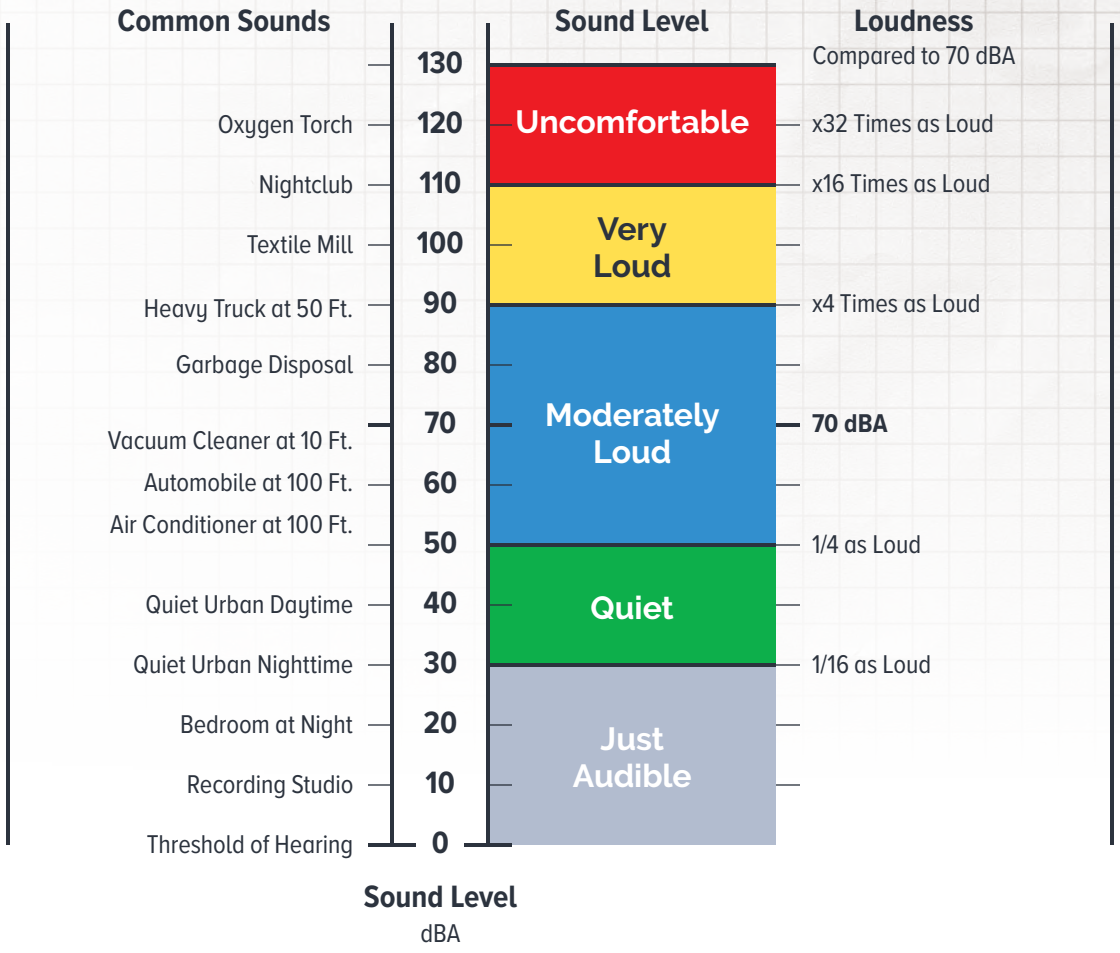


Figure 4-1 Typical A-Weighted Sound Levels of Common Sounds

with JB MDL – McGuire and JB MDL – Lakehurst, and the day-night average sound level (DNL) noise metric is commonly used to quantify such continuous noise at an airfield (see Section 4.2).

Table 4-1 Subjective Response to Changes in Sound Level

Change in Sound Level	Change in Loudness
10 dB	**Twice or half as Loud**
5 dB	**Quite Noticeable**
3 dB	**Barely Perceptible**
1 dB	**No Noticeable Change**

In contrast, impulsive noise refers to sudden noise events that are short in duration, such as a large-caliber weapon firing or an explosive detonation. Impulsive noise events are associated with the JB MDL – Dix area, and the peak sound pressure level (dB PK) noise metric is commonly used to quantify continuous noise at a range (see Section 4.3). Because the noise generated by the small-arms range at JB MDL Dix Range is impulsive and intermittent, this noise may be perceived as being more disruptive than aircraft noise, which can be somewhat anticipated.

4.3 THE DAY-NIGHT AVERAGE SOUND LEVEL

When people hear an aircraft fly overhead, they may ask, "How loud was that?" While people may often find themselves concerned over the loudness of a sound, there are other dimensions to the sound event that draw their interest. For instance, does one overflight draw the same interest as two separate overflights—or 20? Also, does the 30-second run-up of engines prior to takeoff draw the same interest as a 30-minute maintenance run? Additionally, is an overflight more noticeable at 2:00 p.m. or at 2:00 a.m., when the ambient noise is low and most people are sleeping?

The length and number of sound events—the total noise energy—combined with the time of day that a noise event takes place play key roles in people's perception of noise. To reflect these concerns, the Air Force uses the metric DNL. The United States Environmental Protection Agency created DNL for use throughout the United States.

DNL, when used as a metric for aircraft noise and using the A-weighted scale, represents the accumulation of noise energy from all aircraft noise events in a 24-hour period. Additionally, for all operations conducted between 10:00 p.m. and 7:00 a.m., DNL adds a 10-dB adjustment to each sound event to account for the intrusiveness of nighttime operations. As is implied in its name, DNL represents the noise energy present in a daily period. However, because aircraft operations at military airfields fluctuate from day to day, the Air Force typically bases DNL on a year's worth of operations and represents the annual average daily aircraft events.

> **THE DNL NOISE METRIC** is used for both A-weighted and C-weighted noise events, depending on the noise source. In the context of this AICUZ Study, when DNL is used, it is assumed to be A-weighted associated with aircraft-related noise. When it is C-weighted noise related to large-caliber or other impulsive noise, the metric will be specifically identified as "CDNL."

As A-weighted ADNL (in this Study shown simply as DNL) is used in this AICUZ Study to present the average noise contours for aircraft-related noise, C-weighted DNL (CDNL) is used to present noise contours related to large-caliber weapons training, aerial gunnery noise, and other impulsive noise generated at the JB MDL – Dix range. The CDNL metric is also a cumulative noise metric; however, it uses a C-weighted scale, which captures lower-frequency sound levels.

DNL is not a level heard at any given time but instead indicates long-term exposure. Scientific studies have found a correlation between the percentages of groups of people highly annoyed by sounds and the level of average noise exposure measured in DNL.

4.4 PEAK SOUND PRESSURE LEVEL

Although DNL is an effective metric for assessing land use compatibility or the average of all noise events in a day, DNL may not be the best metric for describing community annoyance associated with occasional loud events and their potential impact on communities. DNL accounts for the total noise exposure a community experiences over a period of time. The DoD often uses supplemental metrics such as "unweighted" peak sound levels and maximum sound levels to assess noise levels of impulsive and single sound events. This is necessary because the DNL (average) noise metric may understate the intensity of an impulsive sound event (such as small arms, artillery, or tank gunfire, or explosive detonations) because DNL averages noise peaks with noise levels of ambient quiet times. Supplemental metrics are sometimes a better predictor than DNL for determining noise impacts and likelihood of complaints. For example, the average noise level is irrelevant to a mother upset about a child awakened from naps by impulsive or single-event noises caused by aircraft operations or tank firing.

> **PEAK SOUND EVENT.** Peak is a single event (instantaneous) sound pressure level without weighting. We perceive it as the loudest of a single sound event.

The Air Force uses Peak Sound Pressure Level (dB PK) as the primary metric for assessing operational noise. The dB PK is the highest instantaneous, unweighted sound level over any given period time. The Air Force uses this metric to quantify impulsive, short-duration events, such as a large-caliber weapon firing or an explosive detonation. These levels are outlined in AFH 32-7084 for AICUZ studies. The Air Force uses the peak level metric to measure the noise environment for small-arms ranges (i.e., .50 caliber and below). Blast noise from each shot and weather conditions at the time of the shot can vary. The noise models used to predict peak levels account for this variation by using the Peak15 (dB PK15) metric. PK15 is the peak sound level, factoring in the statistical variations caused by weather, that is likely to be exceeded only 15 percent of the time (i.e., there is an 85-percent certainty that the sound will be within this range). It allows assessment of noise from large-caliber gunfire and impulsive demolition activities, as well as from firing at small-arms ranges.

A peak sound level less than 87 dB PK15 represents an area with minimal noise exposure. Individuals can hear noise and may adapt to noise levels over time. A peak sound level between 87 and 104 dB PK15 represents an area of moderate noise exposure. A peak sound level greater than 104 dB PK15 represents the most severely impacted areas. Peak sound levels above 140 dB represent the threshold for permanent physiological damage to unprotected human ears. Very loud and impulsive sounds, such as those generated from small arms and explosive ordnance disposal (EOD) activities, can also cause secondary effects (e.g., shaking of a structure or rattling of windows). These secondary effects may also lead to noise complaints from residents in the local community.

4.5 NOISE CONTOURS AT JB MDL

The DoD develops noise contours to assess the compatibility of military operations with surrounding land uses. Noise contours connect points of equal sound value, just as contours on topographic maps connect points of equal elevation. This AICUZ Study presents historical and future-year planning noise contours. The Air Force utilizes NOISEMAP, the DoD standard model for assessing noise exposure from military aircraft operations at air installations, as well as the Small Arms Range Noise Assessment Model for small-arms ranges and BNOISE, a model for assessing noise exposure from large-caliber weapons and explosives ranges. Noise contours, when overlaid on local land use maps, can help to identify areas of incompatible land use and assist communities in planning for future development around an air installation.

Aircraft Noise. A-weighted DNL noise contours of 65, 70, 75, and 80 dB are plotted and used to analyze land use compatibility in this AICUZ Study. The effects of atmospheric conditions and terrain were taken into account in the noise model. Local weather conditions (e.g., temperature, relative humidity, and air pressure) influence how quickly sound is absorbed by the atmosphere as it travels outward from its source. The effects of terrain on noise include elevation (e.g., hills and valleys) and surface impedance (i.e., the amount of sound energy absorbed by the land surface).

Range Noise (small-arms and large-caliber weapons). For range-generated noise from multiple weapon types being fired at one or multiple firing points, the peak contours reflect the loudest level that occurs at each receiver location because the noise zones for small-arms fire are based on the loudest weapon and not the number of annual operations conducted at the range. Using the PK15 metric, the Air Force plots two noise zones for use when analyzing land use compatibility for small-arms ranges:

- **87 to 104 dB PK15**
- **>104 dB PK15**

The Air Force plots CDNL noise contours of 57, 62, and 70 dB for large-caliber weapons and explosives operations. Non-munitions noise sources, such as aircraft and ground vehicles, are not covered in the range noise analysis.

4.5.1 Planning Contours

This AICUZ Study provides future-year planning noise contours **(see Figure 4-2).** JB MDL has long been a main mobilization base for emergent effort support. Long-range planning by local land use authorities involves strategies that influence present and future uses of land. Due to the long-range nature of this planning, the Air Force provides planning contours—noise contours based on reasonable projections of future missions and operations. AICUZ studies using planning contours provide a description of the long-term (5 – to 10-year) aircraft noise environment for projected aircraft operations that is more consistent with the planning horizon used by state, tribal, regional, and local planning bodies. The 2022 JB MDL AICUZ Study noise contours are based on projected operations for calendar year 2023.

The Air Force develops planning noise contours based on the best available, realistic, long-range projections of unclassified estimates of future mission requirements. This includes reasonable projections of future operations based on trends in operational tempo, retirement of legacy aircraft, new aircraft entering the inventory, and other factors.

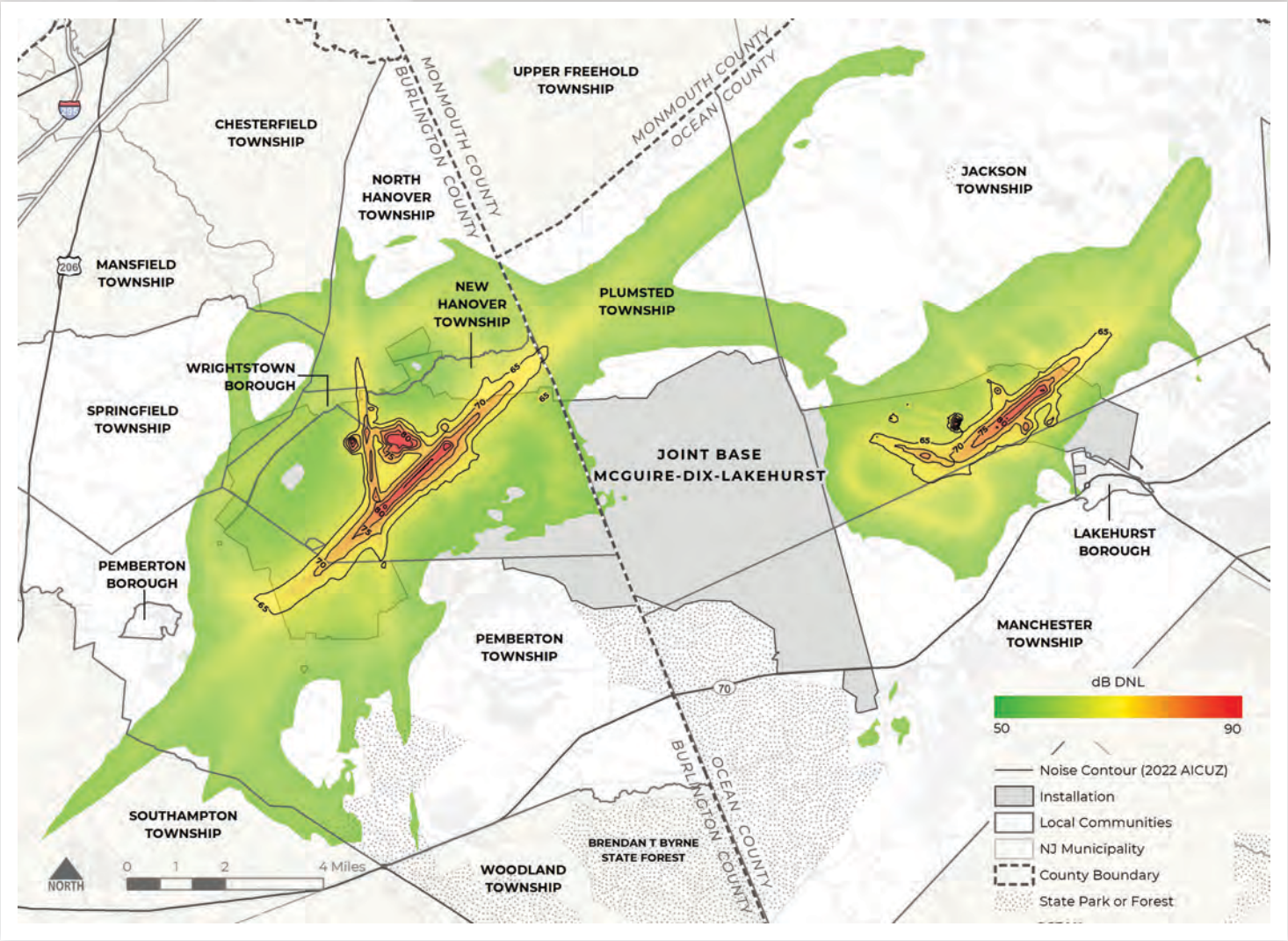


Figure 4-2 2022 AICUZ Study Noise Contours with Gradient Shading for JB MDL

These long-range projections are not commitments to future operations. Inclusion of planning contours in the AICUZ Study does not eliminate the need to conduct appropriate environmental analysis if an assumption used in the development of the planning noise contours becomes a proposed Air Force action.

Assumptions included in the JB MDL AICUZ Study planning noise contours include the transition from the KC-10 airframe to the KC-46 airframe between the years 2020 and 2023 per the MOB 4 EIS record of decision. Table 4-2 presents the projected operations for the JB MDL planning noise contours.

Table 4-2 Annual Aircraft Flight Operations for 2022 AICUZ Noise Contours (Planning Noise Contours)

	Aircraft Type[1]	Departures	Arrivals	Pattern Operations[2]	Totals[3]
JB MDL – McGuire	**Based Aircraft**				
	C-17	2,477	2,477	851	5,805
	C-12	157	157	0	314
	C-130	459	459	400	1,317
	C-32	339	339	3,389	4,067
	CH-53E	626	626	2,503	3,755
	AH-1	261	261	2,606	3,127
	UH-1	209	209	2,086	2,503
	KC-135R	835	835	6,674	8,343
	KC-46A	1,877	1,877	18,720	22,473
	Transient Aircraft				
	Attack/Fighter	63	63	0	126
	Transport/Cargo	3,588	3,588	0	7,176
	Miscellaneous Aircraft	1,212	1,212	0	2,424
	Total Aircraft (JB MDL – McGuire)				
	Based Operations	7,240	7,240	37,229	51,704
	Transient Operations	4,863	4,863	0	9,726
	Combined Sub Total	**12,103**	**12,103**	**37,229**	**61,430**
JB MDL – Lakehurst	**Based Aircraft**				
	C-17	0	0	1,437	1,437
	C-12	965	965	0	1,929
	C-23	272	272	0	545
	FA-18 E/F	3	3	210	216
	UH-60/SH-60	4,015	4,015	13,286	21,316
	General aviation single-engine (fixed/variable-pitch)	1,173	1,173	0	2,346
	Transient Aircraft				
	Attack/Fighter	6	6	0	12
	Transport/Cargo	392	392	14,028	14,813
	Miscellaneous Aircraft	86	86	0	172
	Total Aircraft (JB MDL – Lakehurst)				
	Based Operations	6,428	6,428	14,933	27,789
	Transient Operations	484	484	14,028	14,997
	Combined Sub Total	**6,913**	**6,913**	**28,961**	**42,786**
JB MDL Combined Aircraft Operations Total	**Based Operations**	**13,668**	**13,668**	**52,162**	**79,493**
	Transient Operations	**5,347**	**5,347**	**14,028**	**24,723**
	Grand Total Combined Aircraft Operations	**19,016**	**19,016**	**66,190**	**104,216**

Note: [1] Some aircraft listed are surrogates for aircraft that operate at JB MDL and have a more comprehensive noise profile for modeling purposes. [2] Each "closed pattern operation" consists of two total flight operations: one arrival and one departure. This category also includes "interfacility operations." [3] Some totals may not sum exactly due to rounding

In addition to aircraft flight operations, other elements are included in the planning noise contours for JB MDL – McGuire and JB MDL – Lakehurst, including maintenance run-ups (discussed in Section 3.2) and use of the Jet Car Track Site to the east of Runways 06/24 and 15/33 at JB MDL – Lakehurst. The Jet Car Track Site is used to test the functionality of aircraft arresting systems for use on aircraft carriers. A typical test involves 10 minutes of engines running at the start of the track followed by approximately one minute spent accelerating down the track. It was assumed that an average of 134 jet car tests are conducted annually

4.5.2 JB MDL Airfield Noise Contours

The 2022 JB MDL AICUZ Study noise contours are based on planning noise contours for the year 2023 when the KC-46 beddown is complete **(Figure 4-2).** The 65 dB DNL contour extends beyond the boundary of the base in a few instances on both the JB MDL – McGuire side as well as on the JB MDL – Lakehurst side. At JB MDL – McGuire, the 65 dB DNL contour extends off base to the north (about 0.7 mile), northeast (about 1.4 miles), and southwest (about 0.4 mile). At JB MDL – Lakehurst, the 65 dB DNL contour extends off base in two areas, one to the northeast (about 1.2 miles) and one to the southwest (about 0.2 mile). In addition, the 70 dB DNL noise contour extends beyond the JB MDL base boundary in only two locations, one to the northeast of JB MDL – McGuire (about 0.4 mile) and one to the northeast of JB MDL – Lakehurst (about 0.4 mile). This is the highest noise contour that extends outside the JB MDL installation boundary.

Figure 4-3 shows a comparison of the 2022 and the 2013 AICUZ noise contours for JB MDL – McGuire (the noise contours associated with the JB MDL – Lakehurst remain unchanged from the 2013 AICUZ Study). In general, the 2022 planning contours at JB MDL – McGuire extend slightly farther to the north, northeast, and southwest along the runway headings, compared to the 2013 AICUZ noise contours. Overall, the shape of the noise contours remains consistent, and the size has increased to a small degree, primarily associated with the transition from the KC-10 to the KC-46 airframe at JB MDL – McGuire.

Table 4-3 presents the off-installation land acreage and estimated population within the planning noise contours. The Air Force generates population estimates based on 2014-2018 American Community Survey 5-year Estimates from the US Census Bureau. This is done using data at a census-block-level and applying a geometric proportion method to determine the estimated population within the contour bands. This method assigns population based on the

Table 4-3 Off-Installation Land Area and Estimated Population within Noise Zones for the 2022 AICUZ Study Noise Contours at JB MDL

	Noise Zone (dB DNL)	Acres	Estimated Population
JB MDL – McGuire	65-69	495	294
	70-74	35	19
	75+	0	0
JB MDL – Lakehurst	65-69	245	65
	70-74	40	5
	75+	0	0
JB MDL Combined	65-69	740	359
	70-74	75	24
	75+	0	0
Total (65+)		**815**	**383**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates

Note: Population calculations were estimated based on off-installation census block population levels. JB MDL has a federal prison within the installation boundaries. That prison's population, along with other on-installation personnel, were excluded from these estimates.

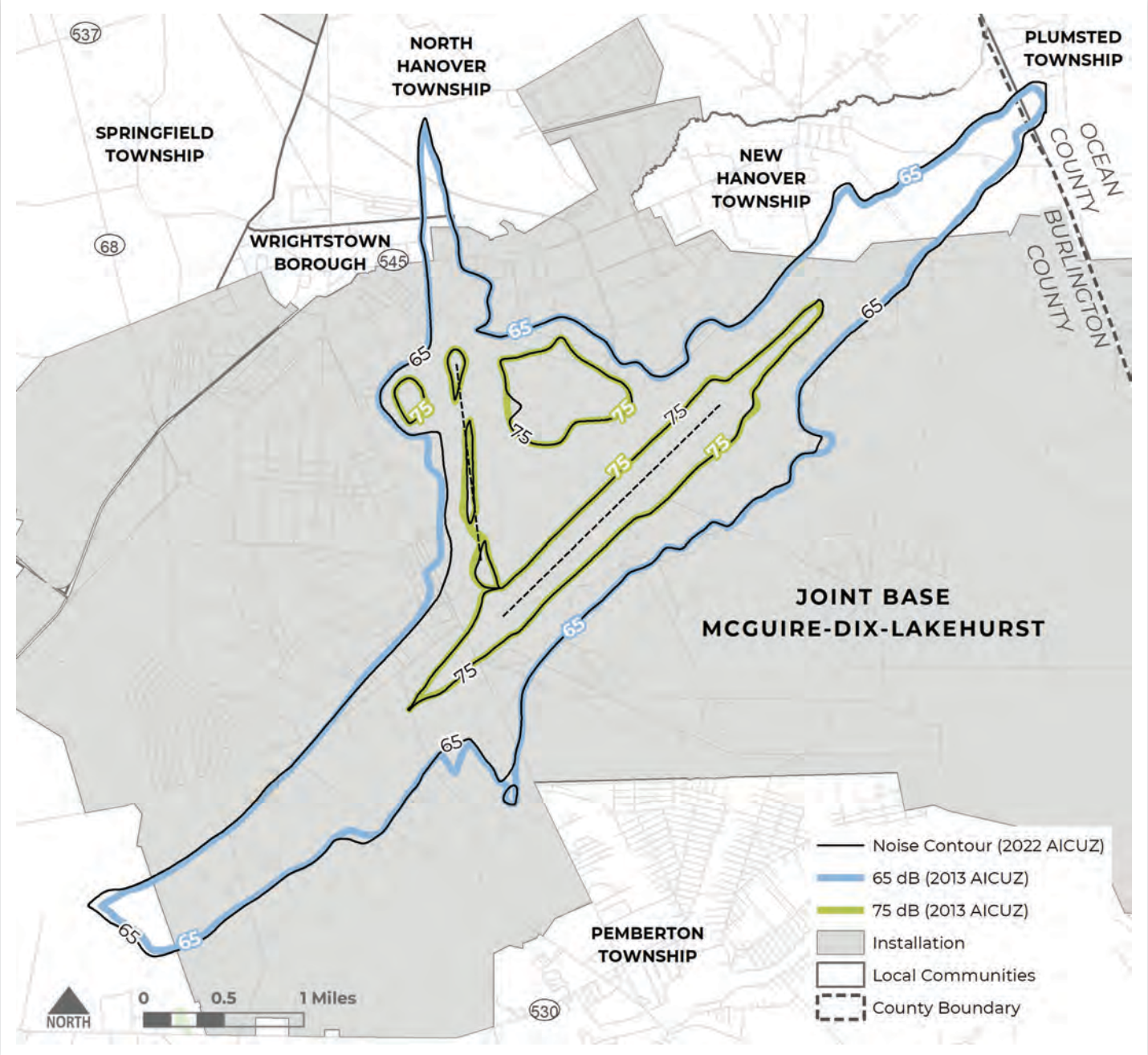


Figure 4-3 **Comparison of 2022 and 2013 AICUZ Study Noise Contours for JB MDL – McGuire**

portion of a census block that falls within the contour. The population across census blocks is assumed to be evenly distributed (Note that in select instances where small areas are covered off installation and it is known no residential structures are in the area, it is assumed the population is zero; these are noted in each table.).

The exposure to a minimum of 65 dB DNL would occur on approximately 815 acres that contain 383 people under both noise contours associated with the two airfields. Approximately 90 percent of this land area and 94 percent of the estimated population fall within the 65-69 dB DNL noise zones. Only 75 acres and 24 people would be in the 70-74 dB DNL noise zone, which is the highest noise zone that extends outside of the installation boundary.

4.5.3 JB MDL – Dix Noise Contours

The 2022 JB MDL AICUZ Study noise contours for large-caliber weapons and explosives and small arms at JB MDL – Dix are based on the same operational numbers outlined in the 2013 AICUZ Study. There have not been substantive changes to range operations, and per JB MDL – Dix ASA operations, the range is essentially at capacity and cannot introduce drastically different or expansive missions due to the size and land restrictions.

Large-Caliber Weapons

The large-caliber rounds fired annually at JB MDL – Dix that were used to calculate the noise zones for this 2022 AICUZ Study are presented in **Table 4-4,** and the resulting noise contours are depicted in the following figures, including time-averaged noise (CDNL) contours **(Figure 4-4)** and peak noise (PK15) contours **(Figure 4-5).**

Table 4-4 Large-Caliber Rounds Fired Annually at JB MDL – Dix

	Rounds Fired Annually			Rounds Fired per Average Annual Day		
Weapon Type	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
155 mm (HE)	359.5	4.6	**364**	1.4	0.0	**1.5**
155 mm (non-HE)	36.5	0.5	**37**	0.1	0.0	**0.1**
120 mm (HE)	561.9	7.1	**569**	2.2	0.0	**2.3**
120 mm (non-HE)	98.8	1.3	**100**	0.4	0.0	**0.4**
81 mm (HE)	493.8	6.3	**500**	2.0	0.0	**2.0**
81 mm (non-HE)	79.0	1.0	**80**	0.3	0.0	**0.3**
60 mm (HE)	268.6	3.4	**272**	1.1	0.0	**1.1**
60 mm (non-HE)	13.8	0.2	**14**	0.1	0.0	**0.1**
Explosives/Charges (HE)	2,693.9	34.1	**2,728**	10.8	0.1	**10.9**
Explosives (simulator)	32,295.5	533.6	**32,829**	129.2	2.1	**131.3**
2.75 in Rocket-Air-Gunnery (HE)	246.9	3.1	**250**	1.0	0.0	**1.0**
20 mm (Air Gunnery (non-HE)	5,925.0	75.0	**6,000**	23.7	0.3	**24.0**
40 mm (HE)	21,643.0	274.0	**21,917**	86.6	1.1	**87.7**
40 mm (non-HE)	48,034.3	613.7	**48,648**	192.1	2.5	**194.6**
Rocket (HE)	131.3	1.7	**133**	0.5	0.0	**0.5**
Mine (HE)	26.7	0.3	**27**	0.1	0.0	**0.1**
Smoke/Light/Incendiary	15,136.6	193.4	**15,330**	60.5	0.8	**61.3**
Grand Total	**128,045**	**1,753**	**129,798**	**512**	**7**	**519**

Source: JB MDL 2013 AICUZ Study.

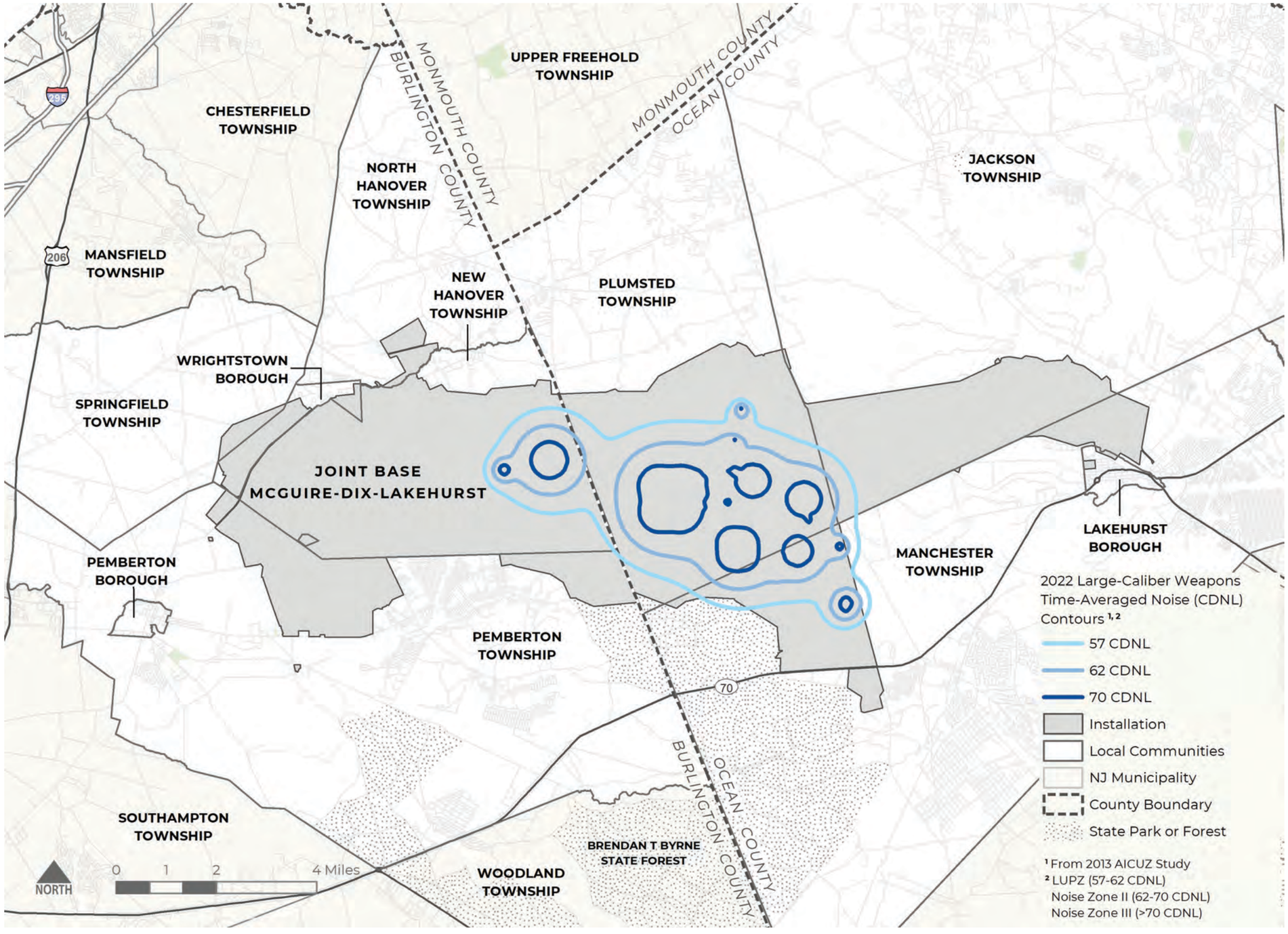


Figure 4-4 **Time-Averaged Noise (CDNL) Contours for Large-Caliber Weapons Fire at JB MDL – Dix**

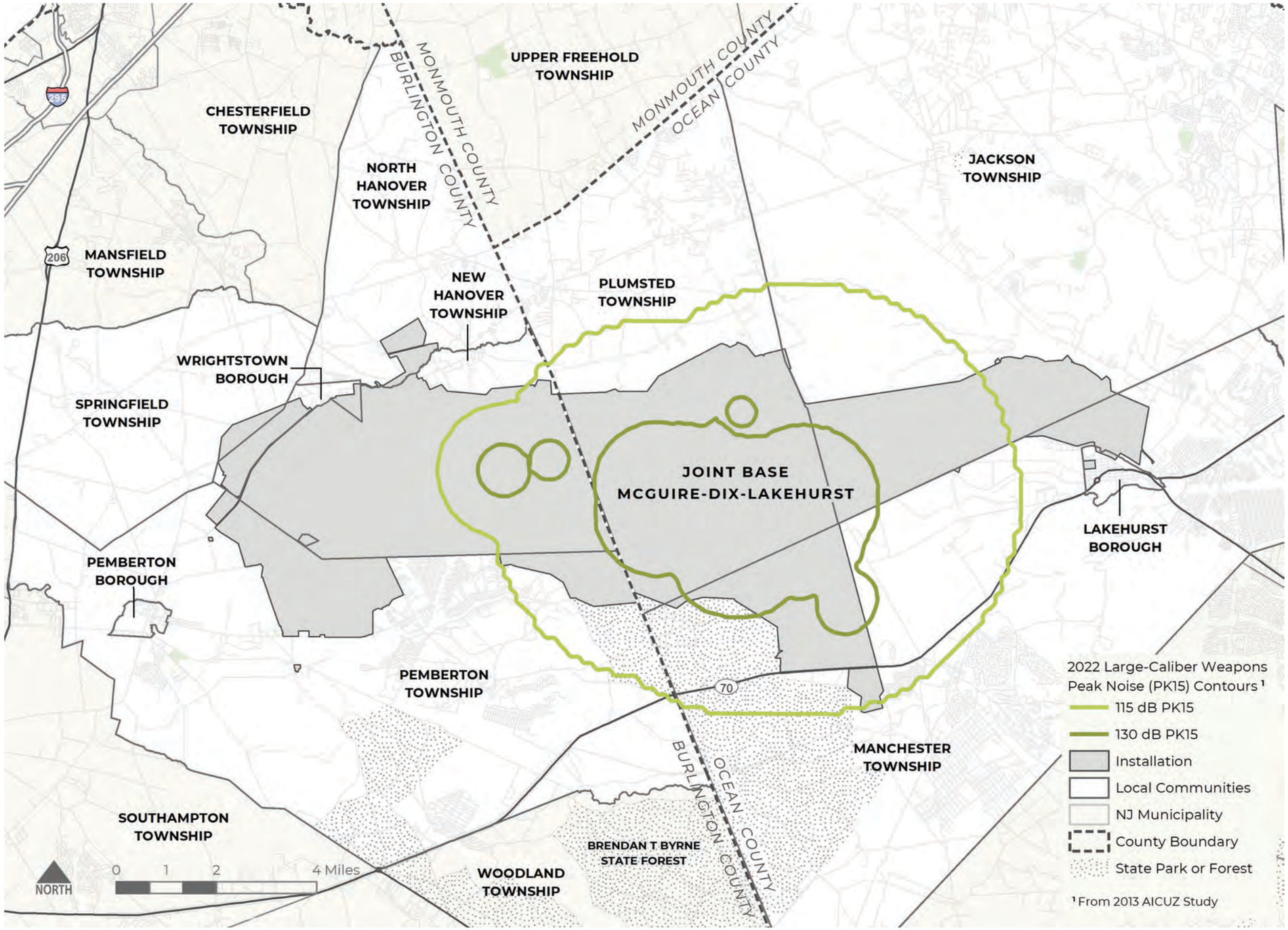


Figure 4-5 **Peak Noise (PK15) Contours for Large-Caliber Weapons Fire at JB MDL – Dix**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The 2022 AICUZ Study large-caliber weapons and explosives noise contours are nearly completely contained within the installation boundary. The land use planning zone (LUPZ) (57-62 CDNL) area extends slightly off installation property to the south and east, as shown on **Figure 4-4.** In addition, a very small portion of Noise Zone II (62-70 CDNL) extends off the base along the eastern boundary of the JB MDL – Dix range. These land areas are quantified in **Table 4-5** with an estimated population; however, it should be noted these areas are undeveloped, forested land and would not have any residents.

To provide additional context to the noise generated at JB MDL – Dix, **Figure 4-5** presents large-caliber weapons peak noise (PK15). Although there are not specific land use recommendations associated with this noise metric for large-caliber weapons, it is shown in order to provide context for the residents living in the vicinity of the installation. Portions of the peak noise contours extend to off-installation areas beyond the time averaged CDNL noise contours. This means that although the average noise from the range would not reach levels that would warrant land use recommendations, people living in these areas would most likely hear noise-generating activities on active range days.

Table 4-5 Off-Installation Land Area and Estimated Population within Large-Caliber Weapons and Explosives CDNL Noise Zones for the 2022 AICUZ Study Noise Contours at JB MDL – Dix

	Noise Zone (CDNL)	Acres	Estimated Population
JB MDL – Dix	57-62	294	58
	62-70	13	0[1]
	70+	0	0
Total		**307**	**58**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates.

Note: Population calculations were estimated based on off-installation census block population levels. JB MDL has a federal prison within the installation boundaries. That prison population, along with other on-installation personnel, was excluded from these estimates.

[1] The specific land area within the 62-70 CDNL noise zones is forested/undeveloped land and therefore would not have any population associated with it.

Small Arms

The small-arms rounds fired annually at JB MDL – Dix that were used to calculate the noise zones for this 2022 AICUZ Study are presented in **Table 4-6,** and the resulting noise contours are depicted in the peak noise (PK15) contours shown on **Figure 4-6.**

The 104 dB PK15 small arms noise contours cover small land areas along the southern perimeter of the JB MDL installation boundary. The 87-104 dB PK15 noise contours extend slightly further off installation property to both the north and south, and slightly to the east. **Table 4-7** presents the acreage within these small-arms noise contour areas, as well as estimated population within those areas.

Table 4-6 Small-Arms Rounds Fired Annually at JB MDL – Dix

	Rounds Fired Annually			Fired per Average Annual Day		
Weapon Type	**Day**	**Night**	**Total**	**Day**	**Night**	**Total**
.22 Caliber	1,481.3	18.8	1,500	5.9	0.1	6.0
.223 Caliber	402,325.4	5,244.6	407,570	1,609.3	21.0	1,630.3
.357 Caliber	8,615.9	109.1	8,725	34.5	0.4	34.9
.38 Caliber	308.1	3.9	312	1.2	0.0	1.2
.40 Caliber	1,584,626.4	20,058.6	1,604,685	6,338.5	80.2	6,418.7
.45 Caliber	32,360.4	409.6	32,770	129.4	1.6	131.1
.50 Caliber	515,170.6	10,457.4	525,628	2,060.7	41.8	2,102.5
.50 Caliber (Tactical)	13,759.1	225.9	13,985	55.0	0.9	55.9
9 mm	1,576,094.4	19,950.6	1,596,045	6,304.4	79.8	6,384.2
9 mm (Tactical)	8.9	0.1	9	0.0	0.0	0.0
10 mm	2,370.0	30.0	2,400	9.5	0.1	9.6
5.56 mm	5,436,583.9	70,595.1	5,507,179	21,746.3	282.4	22,028.7
5.56 mm (Tactical)	1,008,234.5	12,762.5	1,020,997	4,032.9	51.0	4,084.0
7.62 mm	1,183,518.5	25,969.5	1,209,488	4,734.1	103.9	4,838.0
7.62 mm (Tactical)	96,452.1	1,220.9	97,673	385.8	4.9	390.7
Shotgun	94,479.1	1,195.9	95,675	377.9	4.8	382.7
Shotgun (Tactical)	52.3	0.7	53	0.2	0.0	0.2
Grand Total	**11,956,441**	**168,253**	**12,124,694**	**47,826**	**673**	**48,499**

Source: JB MDL 2013 AICUZ Study

Table 4-7 Off-Installation Land Area and Estimated Population within Small-Arms Peak Noise (PK15) Zones for the 2022 AICUZ Study Noise Contours at JB MDL – Dix

	Noise Zone (dB PK15)	Acres	Estimated Population
JB MDL – Dix	87-104	4,524	2,856
	>104	193	139
	Total	**4,717**	**2,995**

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates

Note: Population calculations were estimated based on off-installation census block population levels. JB MDL has a federal prison within the installation boundaries. That prison population, along with other on-installation personnel, was excluded from these estimates.

4.6 NOISE ABATEMENT

The Air Force recognizes that noise from military operations may cause concern for people living near military installations.

For this reason, the Air Force has established a noise program aimed at reducing and controlling the emission of noise and vibrations associated with the use of military aircraft, weapon systems, and munitions while maintaining operational requirements. The result is the implementation of various strategies, techniques, and procedures, documented under the JB MDL Noise Abatement Program, that are aimed at protecting the installation's neighbors and structures from the harmful effects of noise and vibrations.

The primary noise-abatement procedures at JB MDL include the following:

- **From 6:00 a.m. to 10:00 p.m., all practice approaches (Circling, TAD, VFR) will avoid overflight of JB MDL housing** below 1,600' mean sea level (MSL). From 10:00 p.m. to 6:00 a.m., all practice approaches (TAD, VFR) will avoid overflight of JB MDL housing, and circling approaches are prohibited. The exception is the approach to Runway 36 and circle for Runway 06 or approach to Runway 06 and circle for Runway 36.
- **Deborah Hospital** will not be flown over by any aircraft at any time.

In striving to abide by these noise abatement procedures, ATC instructions/directives would still take precedence over noise-abatement procedures for the purposes of aircraft safety.

Installation leadership periodically reviews flight operations and their potential impact on surrounding communities. This review requirement facilitates the planning, designation, and establishment of flight tracks over sparsely populated areas and/or waterways as often as practicable to balance operational safety and reduce noise exposure levels in surrounding communities.

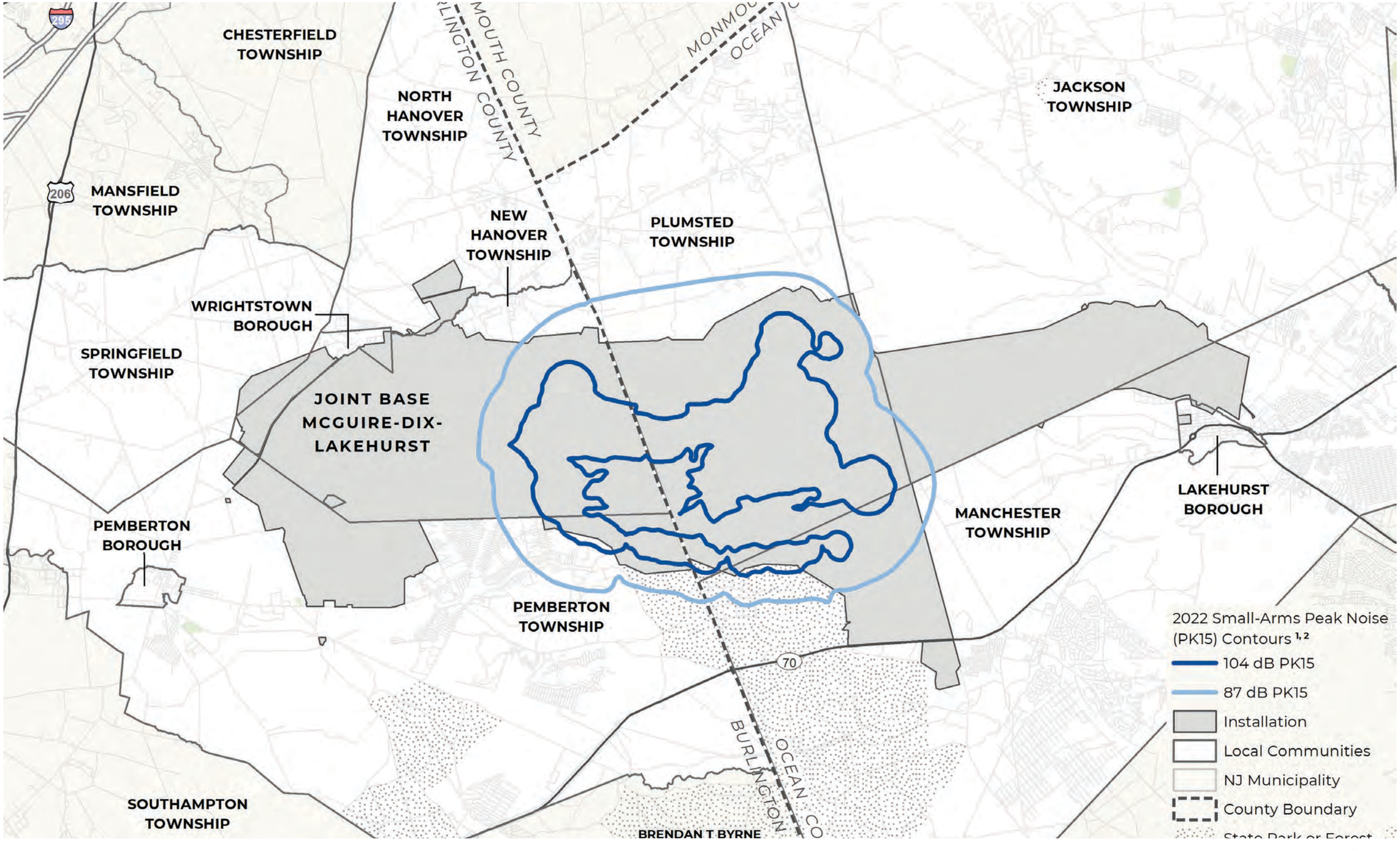


Figure 4-6 **Peak Noise (PK15) Contours for Small-Arms Fire at JB MDL – Dix**

4.7 NOISE COMPLAINTS

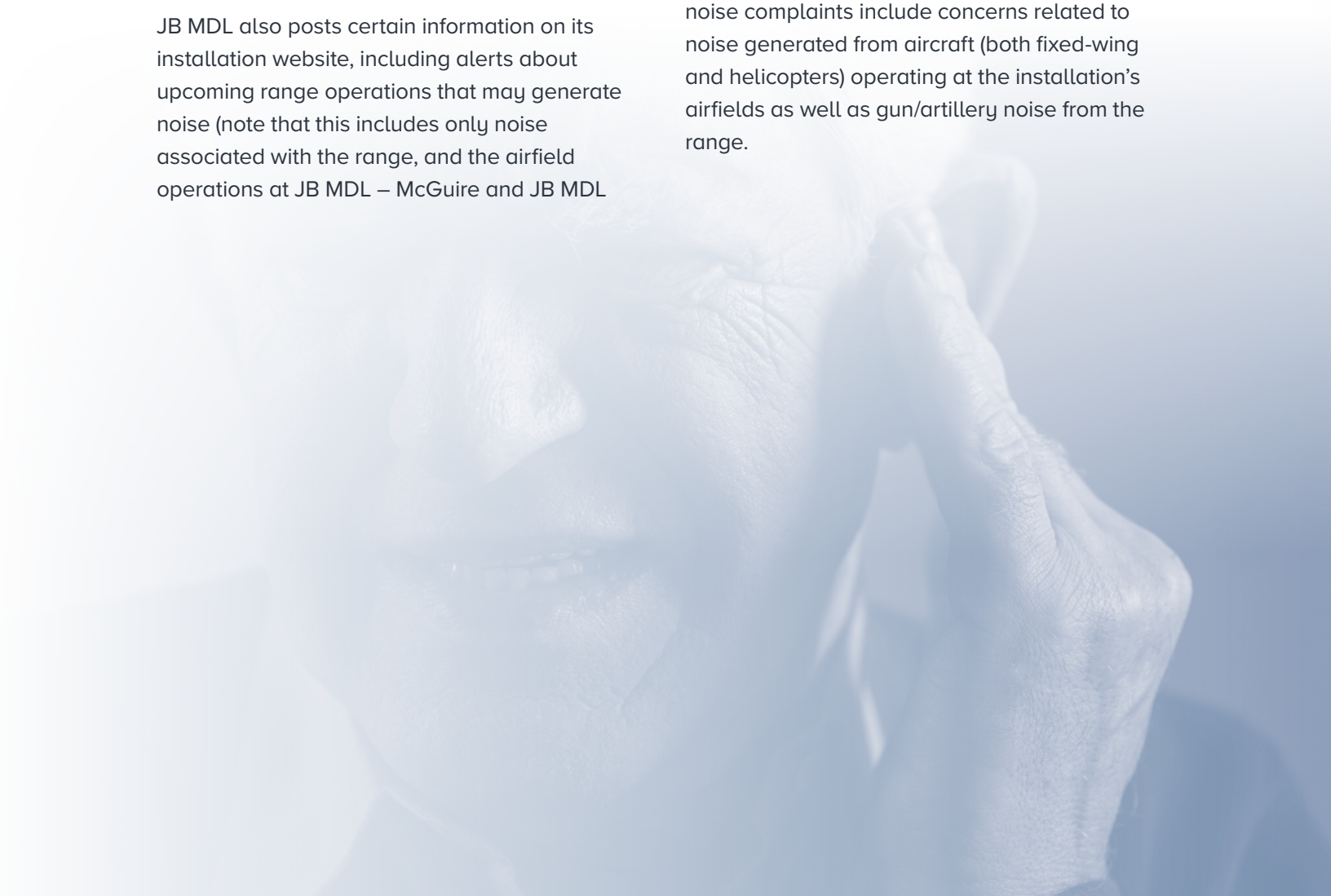
At times, military operations may generate noise complaints. The Air Force evaluates all noise complaints to ensure future operations, when possible, do not generate unacceptable noise. Concerned citizens are encouraged to contact the JB MDL Public Affairs (PA) Office with any noise complaints. Citizens can reach the PA Office at (609) 754-2104 or via email at 87.abw.pa@us.af.mil.

When noise complaints are filed with the base, a noise complaint and resolution form is filled out for review and noise-tracking purposes. This form includes the caller's information, a description of the event and the aircraft involved (including nature of complaint, location, weather, etc.), and a record of coordination from on-base reviewers.

JB MDL also posts certain information on its installation website, including alerts about upcoming range operations that may generate noise (note that this includes only noise associated with the range, and the airfield operations at JB MDL – McGuire and JB MDL – Lakehurst are not included). The "JB MDL Noise Level Calendar" can be found on the installation's website in the lower right at https://www.jbmdl.jb.mil/. Other social media accounts used to post information and/or alerts include:

FACEBOOK	/JointBaseMcGuireDixLakehurst
TWITTER	/JointBaseMDL
YOUTUBE	/JointBaseMDL
INSTAGRAM	/JBMDL
FLICKR	/JointBaseMDL

Over the past five years, noise complaints at JB MDL have been relatively few, ranging between two and ten complaints annually. The noise complaints include concerns related to noise generated from aircraft (both fixed-wing and helicopters) operating at the installation's airfields as well as gun/artillery noise from the range.

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SOURCE: WIKIPEDIA.ORG (MR. MATTÉ)

5. COMMUNITY AND AIRCRAFT SAFETY

Community safety and aircraft safety are paramount to the Air Force and are shared responsibilities between the Air Force and the surrounding communities, with each playing a vital role in their success. Cooperation between the Air Force and the community results in strategic and effective land use planning and development. As such, the Air Force has established a flight safety program and has designated areas of accident potential around its air installations to assist in preserving the health, safety, and welfare of residents living near its airfields. This AICUZ Study provides the information needed, in part, to reach this shared safety goal.

Identifying safety issues assists the community in developing land uses compatible with airfield operations. As part of the AICUZ Program, the Air Force defines areas of accident potential, imaginary surfaces, and hazards to aircraft flight.

5.1 CLEAR ZONES (CZ) AND ACCIDENT POTENTIAL ZONES (APZ)

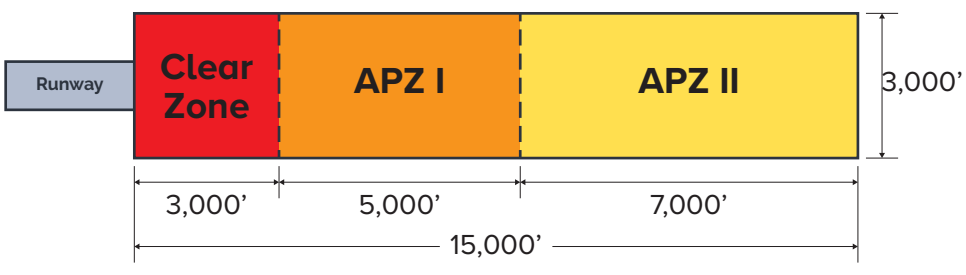
In the 1970s and 1980s, the military conducted studies of historical accident and operations data throughout the military. These studies showed that most aircraft mishaps occur on or near the runway, diminishing in likelihood with distance from the runway. Based on these studies, the DoD identified CZs and APZs as areas where an aircraft accident is most likely to occur if an accident were to take place; however, it should be noted that CZs and APZs are not predictors of accidents. The studies identified three areas that, because of accident potential, planners should consider for density and land use restrictions: the CZ, the Accident Potential Zone I (APZ I), and the Accident Potential Zone II (APZ II). The CZs and APZs for Class B runways are described in the bullets below and are depicted on **Figure 5-1:**

- **Clear Zone:** At the end of all active DoD runways is an area known as the "Clear Zone." The CZ for Class B runways has an area of 3,000 feet square centered on the end of the runway. All active runways have CZs, which should remain undeveloped.
- **APZ I:** Beyond the CZ is APZ I. APZ I is 3,000 feet in width and 5,000 feet in length along the extended runway centerline.
- **APZ II:** APZ II is the rectangular area beyond APZ I. APZ II is 3,000 feet in width by 7,000 feet in length along the extended runway centerline.

Within the CZ, the only land uses compatible with military aircraft operations and defense missions are undeveloped lands and certain right-of-way and agricultural uses. For this reason, it is the Air Force's policy, where possible, to acquire real property interests in land within the CZ to ensure incompatible development does not occur there. Within APZ I and APZ II, a variety of land uses are compatible; however, higher density uses (e.g., schools, apartments, churches) and more intense uses (e.g., office buildings, strip malls) should be restricted because of the greater safety risk in these areas. Chapter 6 discusses land use and recommendations for addressing incompatibility issues within APZs for each of JB MDL's runways.

Figure 5-2 depicts the CZs and APZs for the runways at JB MDL, for both JB MDL – McGuire and JB MDL – Lakehurst. The CZs and APZs associated with Runways 06/24 and 18/36 at JB MDL – McGuire extend straight along the headings of the runway centerlines. The CZs for these runways are entirely contained within the

Figure 5-1 Runway Clear Zones and Accident Potential Zones for Class B Runways



CLASS "B" RUNWAY

APPROXIMATE SCALE

installation boundary, while portions of APZ I and APZ II extend off the installation property to the north and south. It should be noted that even though JB MDL follows Class A runway criteria to preserve ramp parking capacity for Runway 18/36, it is maintained as Class B for APZ purposes to provide conservative protections and allow for operational flexibility.

At JB MDL – Lakehurst, the CZs and APZs associated with Runways 06/24 and 15/33 extend straight along the headings of the runway centerlines. Test Strip 12/30 has CZs and APZs that also extend straight along the headings of the runway centerlines. This addition of APZs to Test Strip 12/30 brings the facility into alignment with guidance which requires APZs for any active runway, and similar to the case of Runway 18/36 at JB MDL – McGuire, the test runway would be maintained as Class B runway. These additional accident potential safety zones promote compatible growth for land uses that may expand into these zones. Although this runway is primarily utilized for FCLP, the number of operations do not warrant curved APZs.

Despite the JB MDL – Lakehurst runways not meeting the specifications of Air Force Class B criteria in terms of airfield compliance, Class B CZs and APZs are applied within this AICUZ for planning purposes and consistency with land use compatibility guidance.

In addition, the Assault Strip Runway 06/24 historically had small CZs and APZs associated with it, but the majority of them are encompassed within the larger CZ from Runway 06/24; they, also, do not extend off installation property. Small portions of the CZs associated with Runways 06/24, 15/33, and Test Strip 12/30 extend slightly off the installation boundary, primarily into vacant/forested areas. Larger areas of APZs I and II for these runways extend off installation property.

Table 5-1 tabulates the off-base land acreage and estimated population within the CZs and APZs. For JB MDL, off-base areas within APZ I affect approximately 1,702 acres and an estimated 714 residents. Off-base areas within APZ II affect approximately 3,319 acres and an estimated 2,045 residents. The CZs for JB MDL also includes an estimated 120 acres associated with the runways at the JB MDL – Lakehurst. However, the specific land areas covered by these CZs are forested/undeveloped lands and would not have any population associated with them. Therefore, zero residents have been attributed to these areas. Chapter 6 discusses land use and recommendations for addressing incompatibility issues within CZs and APZs for an airfield.

Table 5-1 Off-Installation Land Area and Estimated Population within the Clear Zones and Accident Potential Zones

Zone	Acres	Population
JB MDL – McGuire		
CZ	0	0
APZ I	350	264
APZ II	1,148	1,153
JB MDL – Lakehurst		
CZ	120	0[1]
APZ I	1,352	450
APZ II	2,171	892
JB MDL Totals		
CZ	120	0
APZ I	1,702	714
APZ II	3,319	2,045

Source: U.S. Census Bureau, 2014-2018 American Community Survey 5-Year Estimates

Note: Population calculations were estimated based on off-installation census block population levels. JB MDL has a federal prison within the installation boundaries. That prison's population, along with other on-installation personnel, were excluded from these estimates.

[1] The specific land areas covered by the JB MDL – Lakehurst Clear Zones are forested/undeveloped lands and therefore would not have any population associated with them.

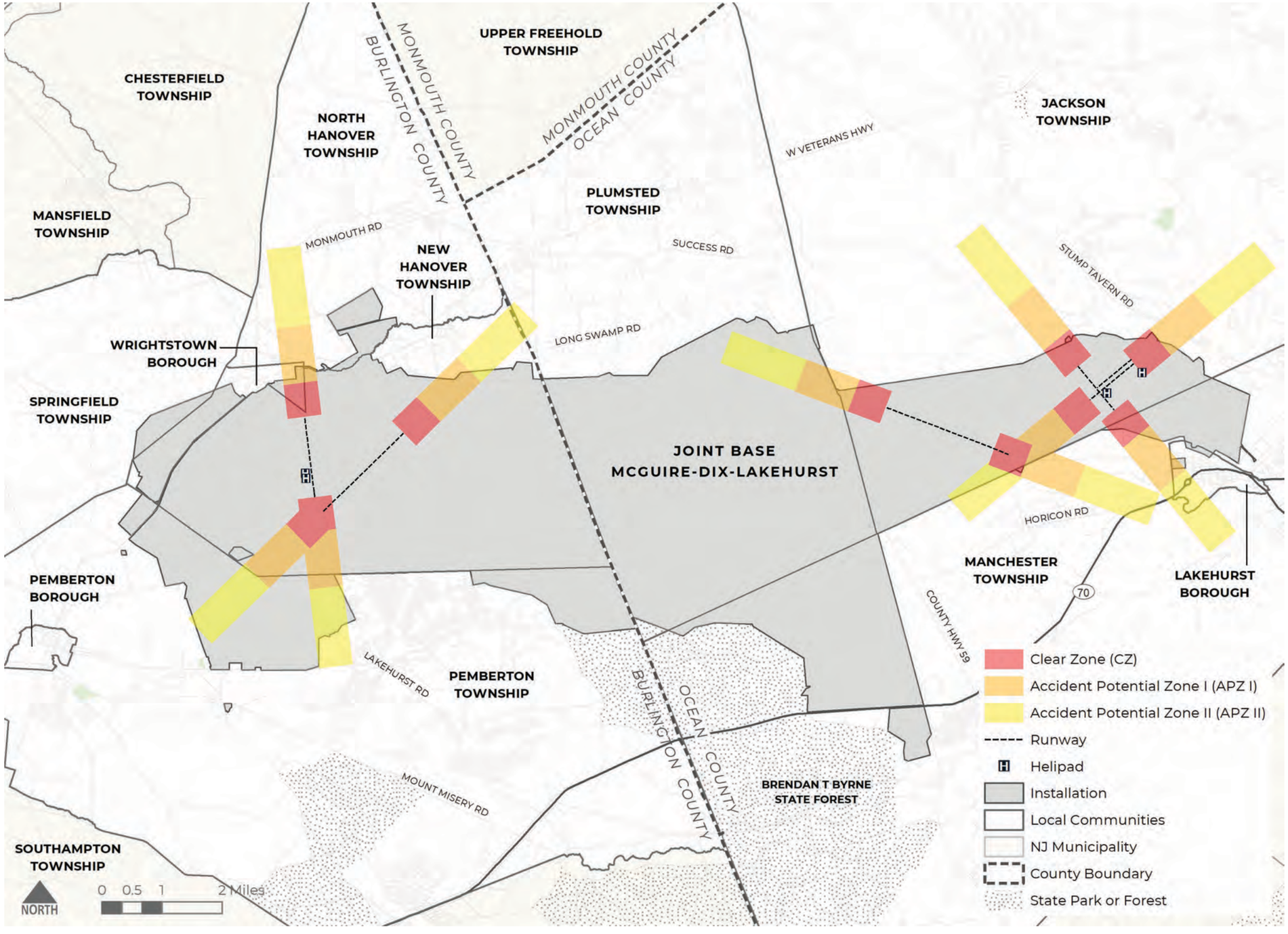


Figure 5-2 **2022 AICUZ Study Clear Zones and Accident Potential Zones for JB MDL**

5.2 IMAGINARY SURFACES

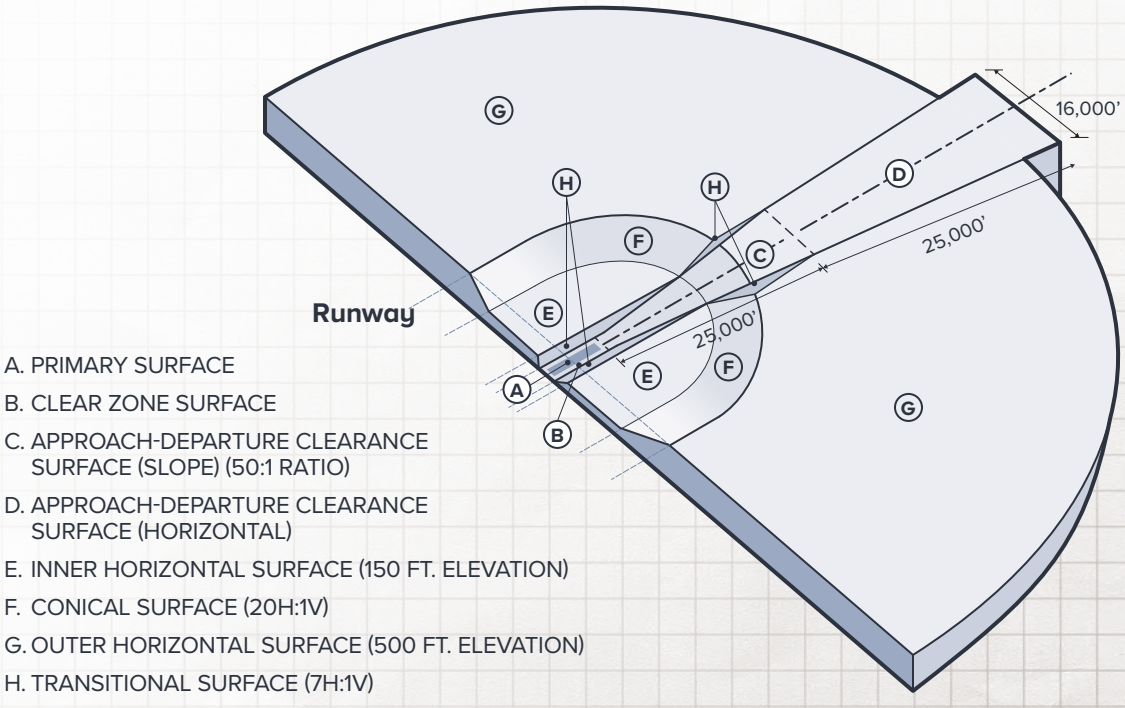
The DoD and FAA identify a complex series of imaginary planes and transition surfaces that together define the airspace needed to remain free of obstructions around an airfield. Obstruction-free imaginary surfaces form a complex bowl around the airfield to ensure safe flight approaches, departures, and pattern operations. Obstructions include natural terrain and man-made features such as buildings, towers, poles, wind turbines, cell towers, and other vertical obstructions to airspace navigation.

There are different imaginary surfaces for fixed-wing runways (depending on type of aircraft supported by the runway) and rotary-wing runways/helipads. An illustration of the imaginary surfaces for typical Class B fixed-wing runways such as those at JB MDL is depicted on Figure 5-3. Table 5-2 provides brief descriptions for each of these surfaces. Figure 5-4 depicts the actual runway airspace imaginary surfaces specific to JB MDL's Class B runways, both for JB MDL – McGuire and JB MDL – Lakehurst. It should be noted that even though JB MDL follows Class A runway criteria to preserve ramp parking capacity for Runway 18/36, it is maintained as Class B for APZ purposes to provide conservative protections and allow for operational flexibility.

In general, the Air Force does not permit above-ground structures on the primary surface (located on base), and height restrictions apply to transitional surfaces and approach and departure surfaces. Height restrictions are more stringent for areas closer to the runway and flight paths.

In addition, helipad airspace imaginary surfaces are areas in space around helipads. The surfaces are designed to define the areas that must remain obstacle-free for safe aircraft operation. Helicopters do operate from the JB MDL airfields; however, the helipad airspace imaginary surfaces do not extend beyond the installation boundary.

Figure 5-3 Imaginary Surfaces and Transition Planes for Class B Fixed-Wing Runways



A. PRIMARY SURFACE
B. CLEAR ZONE SURFACE
C. APPROACH-DEPARTURE CLEARANCE SURFACE (SLOPE) (50:1 RATIO)
D. APPROACH-DEPARTURE CLEARANCE SURFACE (HORIZONTAL)
E. INNER HORIZONTAL SURFACE (150 FT. ELEVATION)
F. CONICAL SURFACE (20H:1V)
G. OUTER HORIZONTAL SURFACE (500 FT. ELEVATION)
H. TRANSITIONAL SURFACE (7H:1V)

Table 5-2 Descriptions of Imaginary Surfaces for Military Airfields with Class B Runways

Primary Surface	An imaginary surface symmetrically centered on the runway, extending 200 feet beyond each runway end that defines the limits of the obstruction clearance requirements near the landing area. The width of the primary surface is 2,000 feet, or 1,000 feet on each side of the runway centerline.
Approach-Departure Clearance Surface	An imaginary surface symmetrically centered on the extended runway centerline, beginning as an inclined plane (glide angle) at the end of the primary surface (200 feet beyond each end of the runway), and extending for 50,000 feet. The slope of the approach-departure clearance surface is 50:1 until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 25,000 feet from the starting point. The width of this surface at the runway end is 2,000 feet, flaring uniformly to a width of 16,000 feet at the end.
Inner Horizontal Surface	This imaginary surface is an oval plane at a height of 150 feet above the established airfield elevation. The inner boundary intersects with the approach-departure clearance surface and the transitional surface. The outer boundary is formed by scribing arcs with a radius of 7,500 feet from the centerline of each runway end and interconnecting these arcs with tangents.
Conical Surface	An inclined imaginary surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation. The slope of the conical surface is 20:1. The conical surface connects the inner and outer horizontal surfaces.
Outer Horizontal Surface	An imaginary surface that is located 500 feet above the established airfield elevation and extends outward from the outer periphery of the conical surface for a horizontal distance of 30,000 feet.
Transitional Surface	An imaginary surface that extends outward and upward at an angle to the runway centerline and extended runway centerline at a slope of 7:1. The transitional surface connects the primary and the approach-departure clearance surfaces to the inner horizontal, the conical, and the outer horizontal surfaces.

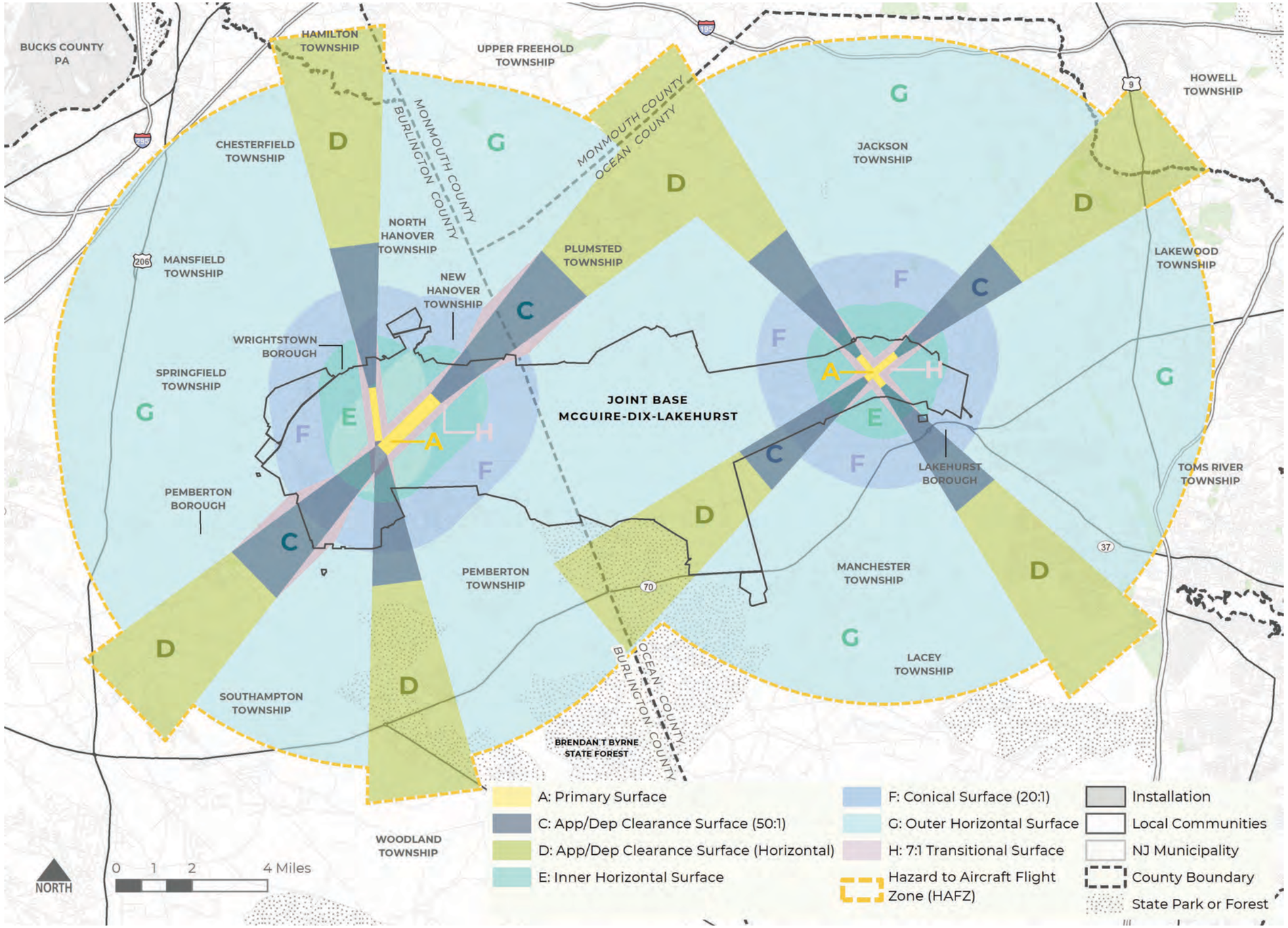


Figure 5-4 Runway Airspace Imaginary Surfaces and Transition Planes for JB MDL

5.3 HAZARDS TO AIRCRAFT FLIGHT ZONE (HAFZ)

Certain land uses and activities pose potential hazards to flight. To ensure land uses and activities are examined for compatibility, the Air Force has identified a Hazards to Aircraft Flight Zone. The HAFZ is defined as the area within the imaginary surfaces that are shown on **Figure 5-4** above. Please note that the area and shape of the HAFZ may change with the encroachment issue at hand. For instance, issues related to bird/wildlife aircraft strike hazards (BASH) may follow natural boundaries, encompass local bodies of water, and extend along flight paths. Unlike noise zones and safety zones, the HAFZ does not have recommended land use compatibility guidance. Instead, HAFZ is a "consultation zone"—one for which project applicants and local planning bodies are recommended to consult with the Air Force to ensure the project is compatible with Air Force operations. These HAFZ land use and activity compatibility considerations include:

Height: Tall objects can pose significant hazards to flight operations or interfere with navigational equipment (including radar). City and county agencies involved with approvals of permits for construction should require developers to submit calculations showing that projects meet the height restriction criteria of 14 Code of Federal Regulations (CFR) 77.17 for the specific airfield described in the AICUZ Study. City and county agencies may also consider requiring a "Determination of No Hazard" be issued by the FAA for any tall objects within this zone.

Visual Interference: Industrial or agricultural sources of smoke, dust, and steam in the airfield vicinity can obstruct a pilot's vision during takeoff, landing, or other periods of low-altitude flight. Close coordination between the installation and landowners can often mitigate these concerns. For example, irrigating before plowing can greatly reduce dust concerns.

Light Emissions: Bright lights, either direct or reflected, in the airfield vicinity can impair a pilot's vision, especially at night. A sudden flash from a bright light causes a spot, or "halo," to remain at the center of the visual field for a few seconds or more, rendering a person virtually blind to all other visual input. This is particularly dangerous for pilots at night, when the flash can diminish the eye's adaptation to darkness. The eyes partially recover their adaptation to darkness in a matter of minutes, but full adaptation typically requires 40 to 45 minutes. Specific examples of light emissions that can interfere with the safety of nearby aviation operations include:

- **Lasers that emit in the visible spectrum,** which can be potentially harmful to a pilot's vision during both day and night.
- The increasing **use of energy-efficient light-emitting diode (LED) lighting,** which poses potential conflicts in areas where pilots use NVGs. NVGs can exaggerate the brightness of these lights, interfering with pilot vision.
- The **use of red LED lights to mark obstructions,** as red LED lights are not visible on most NVG models and therefore are invisible to NVG users in the area.

BASH: Wildlife represents a significant hazard to flight operations. Birds, in particular, are drawn to different habitat types found in the airfield environment, including hedges, grass, brush, forest, water, and even the warm pavement of the runways. Due to the speed of the aircraft, collisions with wildlife can happen with considerable force. Although most bird and animal strikes do not result in crashes, they cause structural and mechanical damage to aircraft as well as loss of flight time.

Most aircraft collisions occur below 2,000 feet. To reduce the potential of a BASH incident, the Air Force recommends that land uses that attract birds not be located near installations with an active air operations mission. These land uses include:

- Waste disposal operations;
- Wastewater treatment facilities;
- Transfer stations;
- Landfills;
- Golf courses;
- Wetlands;
- Storm water ponds; and
- Dredge disposal sites.

Birds and raptors in search of food or rodents will flock to landfills, increasing the probability of BASH occurrences near these facilities. Design modifications can be used to reduce the attractiveness of these types of land uses to birds and other wildlife.

JB MDL has an identified BASH issue due to resident and migratory bird species and other wildlife present near the base; however, there is also a robust program and activity to control it. The JBMDL Air Mobility Wing has a BASH plan in place to address these hazards and also maintains a contract with the United States Fish and Wildlife Service, United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services to assist in managing these wildlife-related hazards. This BASH plan establishes procedures to minimize hazardous conditions at JB MDL. The base uses a variety of techniques and organizations in its BASH control program. This plan is designed to:

- Establish a **wildlife hazard working group** and designate members' responsibilities;
- Establish **aircraft and airfield operation procedures** to avoid high hazard situations;
- Establish **procedures for disseminating bird hazard information** and avoidance procedures;
- Establish active and passive management procedures to **decrease airfield attractiveness to birds and other wildlife,** and disperse birds/wildlife on airfield property; and
- Identify organizations and offices of **primary responsibility with authority** to initiate, upgrade, or downgrade bird watch conditions.

JB MDL's BASH program has two phases. Phase I represents periods of average bird activity, and Phase II represents periods of heavy bird activity. Late fall and winter migratory seasons are the most likely period of heavy local bird activity; therefore, from November 1 to March 31, the airfields are in Phase II. During Phase II, JB MDL generally restricts (or limits) operations during the 2-hour periods from one hour before until one hour after sunrise and sunset, which are typically high-activity times for migratory birds.

Certain aspects of BASH are unique within JB MDL because of the presence of two airfields within the JB MDL installation but their locations being approximately 12 miles apart. These unique BASH aspects relate to the types of bird/wildlife hazards more commonly found at each airfield. For instance, birds are a more common occurrence at JB MDL – McGuire, while deer on the runway may be a more common occurrence at JB MDL – Lakehurst runways. JB MDL – McGuire and JB MDL – Lakehurst operate under the same BASH phases because the phases are related to overall migratory bird corridors and habits; however, the airfields can operate under different "bird watch conditions" because these reflect a specific local condition.

Radio Frequency/Electromagnetic Interference: The American National Standards Institute defines electromagnetic interference (EMI) as any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment.

EMI can be induced intentionally, as in forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, such as high-tension line leakage and industrial machinery. In addition, EMI may be caused by atmospheric phenomena, such as lightning or precipitation static.

New generations of military aircraft are highly dependent on complex electronic systems for navigation and critical flight and mission-related functions. Consequently, communities should use care when siting any activities that create EMI. Many of these sources are low-level emitters of EMI. However, when combined, they have an additive quality.

EMI also affects consumer devices, such as cell phones, FM radios, television reception, and garage door openers. In some cases, the source of interference occurs when consumer electronics use frequencies set aside for military use.

Drones/Unmanned Aircraft Systems (UAS):

The use of drones near military airfields poses a serious flight safety hazard due to the potential for a mid-air collision between military aircraft and small – to medium-sized drones. The FAA maintains specific guidance about where drones (i.e., UAS) can be flown. Currently, non-DoD drone operations are not permitted within certain zones surrounding military bases. Additional restrictions are in place around airports, sports stadiums, and security-sensitive areas. For more information on drone use in and around DoD airfields, visit the FAA's website at: www.faa.gov/uas.

JB MDL is a "no drone zone," and use of all UAS and model aircraft, to include helicopters, quadcopters, and similar aircraft, on installation property is prohibited. To register your private unmanned aircraft, log on to www.faa.gov/usa/registration. Failure to register your unmanned aerial system can result in fines up to $250,000 and/or up to three years in prison. For more information on drone use in and around DoD airfields, visit the FAA's website at: www.faa.gov/uas.

It is important to note that in 2015, the FAA created a new statutory requirement that applies to all privately owned, unmanned aircraft that weigh more than 55 pounds. The FAA's goal is to allow the "opportunity to educate new aircraft users before they fly, so that they know the airspace rules and understand that they are ultimately accountable" and responsible for incidents that may occur as a result of their new equipment.

Presently, users are required to register aircraft meeting the aforementioned requirements in a national data base. The registration is web-based, and registrants will be required to provide a nominal fee of $5 per application. This registration will be valid for a period not to exceed three years. The registration process requires registrants to provide their name, home address, and a valid email address. When the application is complete, a registrant will receive an aircraft registration/proof of insurance certificate and an identification number that is required to be marked on the aircraft. If a registrant owns multiple unmanned aircraft, this registration number will be valid for all of them.

The FAA distinguishes between recreational UAS flyers and commercial operators and has a process for each to be allowed to operate. Due to the novelty and ever-changing environment, drone operators should visit www.faa.gov/uas to ensure they have the most up-to-date guidance on how to legally operate. The DOD is utilizing a variety of counter-small unmanned aerial systems (counter-sUAS) technologies as mitigation, such as the NINJA system which is a technology that can detect, disrupt and mitigate drone activities.

JB MDL is a "no drone zone," and operating drones anywhere on the base is not acceptable. In addition, the FAA has imposed drone flight restrictions within approximately five miles of the airfields associated with the installation.

JB MDL has established a drone working group in order to prevent unapproved drone usage as well as identify criteria for potentially acceptable drone usage; this working group also provides a variety of information on its website (https://www.jbmdl.jb.mil/Quick-Links/JB-MDL-Drone-UAS-Awareness/).

5.4 SURFACE DANGER ZONES

Potential safety hazards are related to the activities conducted at JB MDL – Dix areas. These safety hazards for specific ground-to-ground live-fire operations are denoted by a defined spatial area called a surface danger zone (SDZ). An SDZ depicts the space necessary for containment of projectiles, fragments, and debris from the firing of a ground weapons system or EOD activity. SDZs represent a mathematically predicted, three-dimensional area of ground and airspace that projectiles or fragments could travel through and impact the earth, either by direct fire or ricochet from ground-based live-fire operations. SDZ boundaries are based on the worst-case scenario for how and where a given munition type could travel. SDZs are designed to make the probability of a hazardous fragment escaping from range boundaries unlikely and minimize the danger to the public, range personnel, facilities/equipment, and property.

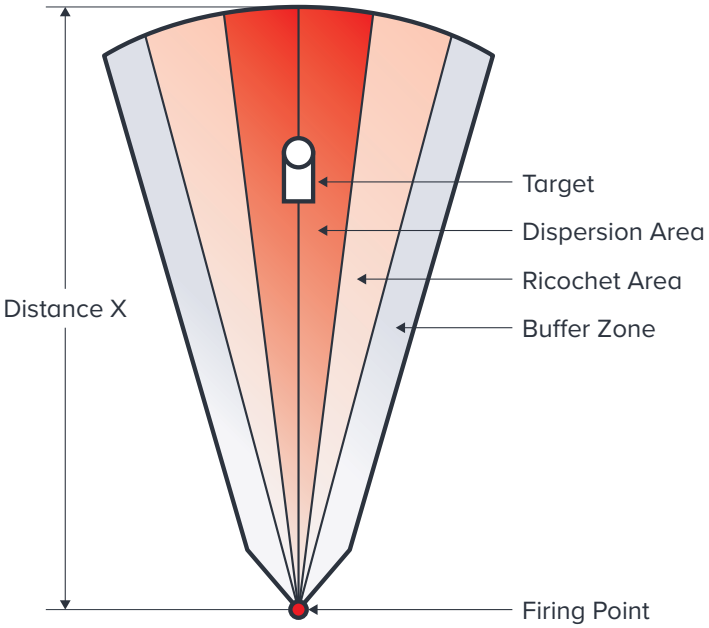
SDZ sizes and shapes are dependent on the characteristics of the weapon system, ammunition, training requirements, geographical location, and environmental conditions. Figure 5-5 depicts notional parameters of a basic cone SDZ and its components, as defined below:

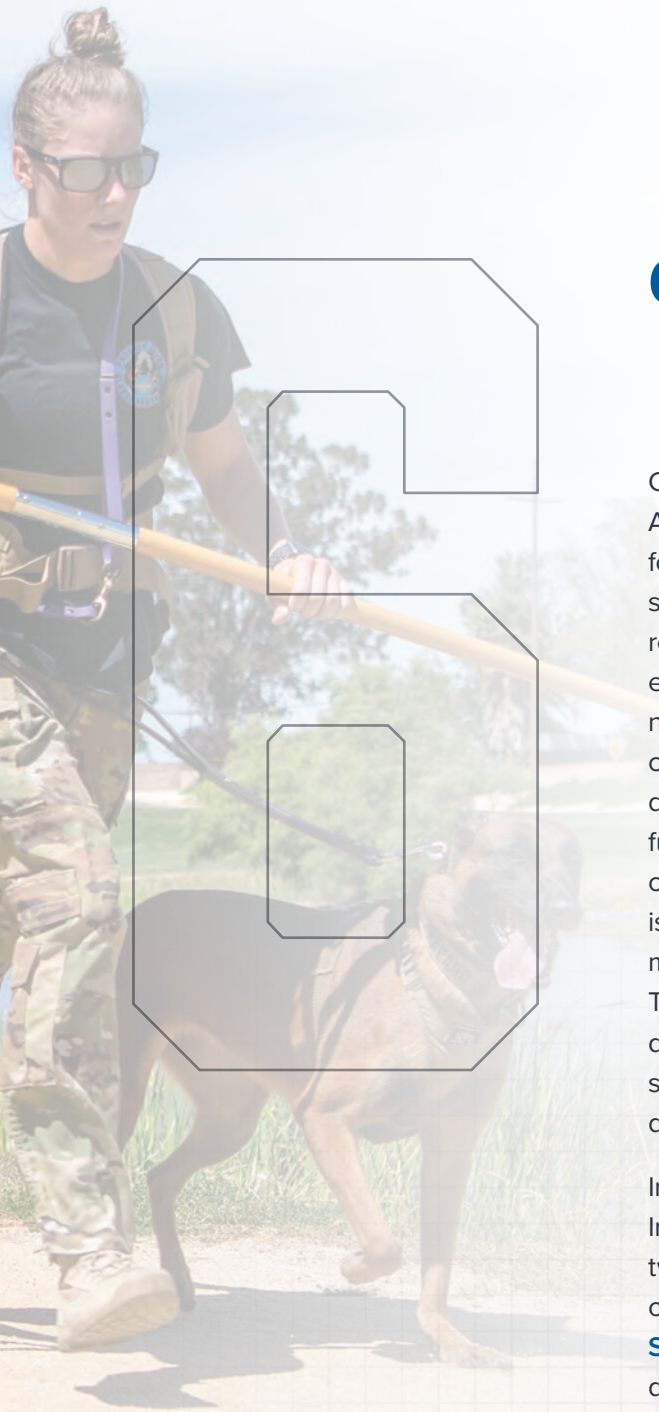
- The "distance X" of an SDZ is the maximum distance a projectile will travel when fired from a weapon system.

- The “dispersion area” is the area directly outside the gun target line that accounts for human error, weapon error, or propellant malfunction.
- The “ricochet area” is located outside the dispersion area and contains any projectiles after they make contact with the target.
- The “buffer zone” is the secondary danger area that laterally parallels the ricochet area and contains fragments, debris, and components from frangible or explosive projectiles and warheads functioning on the outside edge of the ricochet area.

The SDZs at JB MDL – Dix are entirely contained within the boundaries of the installation and therefore require internal planning and deconflicting; therefore, they do not pose a compatibility concern for areas off installation property.

Figure 5-5 Typical Surface Danger Zone





6. LAND USE COMPATIBILITY ANALYSIS

CZs, APZs, and noise zones, shown in **Figure 6-1,** make up the AICUZ footprint for an air installation, and that footprint is the basis for JB MDL's land use compatibility analysis (along with the HAFZ shown on **Figure 5-4**). The AICUZ footprint defines the minimum recommended area within which land use controls are needed to enhance the health, safety, and welfare of those living or working near a military airfield and to preserve the flying mission. The components of the AICUZ footprint, combined with the guidance and recommendations set forth in the AICUZ Study, are the fundamental tools necessary for the planning process to achieve overall land use compatibility. As noted in **Section 5.3,** the HAFZ is considered a consultation zone where development should be monitored, but there are not specific land use recommendations. The Air Force recommends that local and regional governments adopt the AICUZ noise zones, CZs, APZs, and HAFZ into planning studies, regulations, and processes to better guide compatible development around installations.

In addition, through the Readiness and Environmental Protection Integration (REPI) Program, plans have called for protecting a two-mile buffer around JB MDL that will preserve remaining open space and agricultural lands; this is discussed further in **Section 7.2.** This buffer will meet specific environmental objectives and also help conserve lands that could potentially threaten the military mission if developed in an incompatible way. As discussed in depth within this section, the buffer assists JB MDL in limiting overall incompatible land uses surrounding the installation.

6.1 LAND USE COMPATIBILITY GUIDELINES AND CLASSIFICATIONS

In an effort to establish long-term compatibility for lands within the vicinity of military installations and ranges, the DoD has created land use compatibility recommendations based on the Federal Highway Administration's (FHWA's) Standard Land Use Coding Manual (SLUCM). These guidelines are used by DoD personnel for on-installation planning and for engaging with the local community to foster compatible land use development off installation. **Table A-1** of **Appendix A** shows the suggested land use compatibility guidelines within the CZs and APZs. **Table A-2** of **Appendix A** provides land use compatibility recommendations within noise zones for aircraft noise. **Table A-3** of **Appendix A** provides land use compatibility recommendations for small-arms noise. **Table A-4** of **Appendix A** provides land use compatibility recommendations for large-caliber weapons and artillery/explosives.

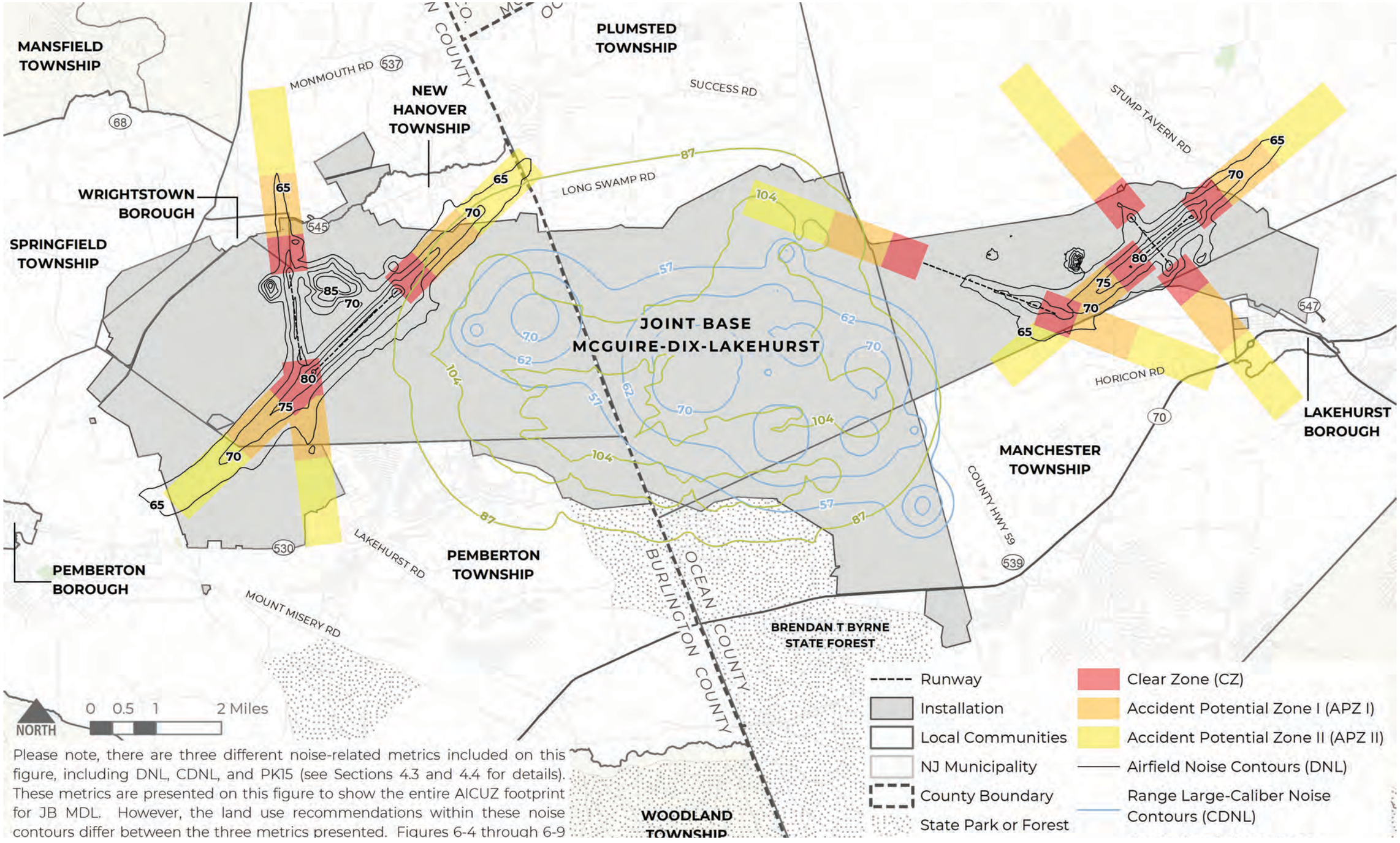
Section 6.4 presents the compatibility analysis and concerns within noise zones (both airfield and range related) and APZs associated with JB MDL.

6.2 PLANNING AUTHORITIES, STAKEHOLDERS, AND POLICIES

This section presents information for each governing body that has land use jurisdictions near JB MDL, including descriptions of existing land uses and zoning, relevant stakeholder groups, and existing compatible planning policies and regulations.

New Jersey State Planning Act of 1986

As a home rule state, New Jersey allows counties, municipalities, and cities to manage local planning and ordinances in accordance with state and federal constitutions, including the requirement to prepare and update a master plan at least every 10 years following the municipal land use law. The New Jersey State Planning Act was enacted in 1986 to help coordinate land use planning and development throughout the state. Per the act, the State Planning Commission regularly revises and adopts a state plan to provide local governments with the technical resources and guidance necessary to develop land use plans and procedures based on sound planning information and practice, and to ensure that local plans are consistent with state plans and programs (New Jersey State Planning Commission, 2001).



Please note, there are three different noise-related metrics included on this figure, including DNL, CDNL, and PK15 (see Sections 4.3 and 4.4 for details). These metrics are presented on this figure to show the entire AICUZ footprint for JB MDL. However, the land use recommendations within these noise contours differ between the three metrics presented. Figures 6-4 through 6-9

Figure 6-1 Composite AICUZ Footprint for JB MDL

New Jersey Pinelands Commission

The New Jersey Pinelands Commission is an independent state agency whose mission is to "preserve, protect, and enhance the natural and cultural resources of the Pinelands National Reserve, and to encourage compatible economic and other human activities consistent with that purpose." The Commission implements a comprehensive plan that guides land use, development and natural resource protection programs in the 938,000-acre Pinelands Area of southern New Jersey, which includes areas in the immediate vicinity of JB MDL.

Ocean County

The Ocean County Department of Planning serves as staff to the Ocean County Planning Board, which reviews applications for subdivisions of land, site development, and use or modification of commercial or industrial site facilities along a county road or that are affecting county drainage facilities. The department also supports county planning programs (e.g., community and economic development, strategic planning, open space preservation, etc.). Since the county does not have authority over land use or zoning in its 33 municipalities, its *2011 Comprehensive Master Plan* serves as a non-regulatory planning guide that incorporates recommendations consistent with county, regional, and state initiatives. The growing importance of JB MDL to Ocean County is addressed in *Chapter 9: Military Land Use Compatibility* with a summary of joint land use study recommendations and progress to date (Ocean County, 2011).

Borough of Lakehurst: The Land Use Board is responsible for all land use matters in the borough, including the master plan, subdivision control, and the zoning ordinance. The Office of Planning and Projects coordinates the master plan, which is currently being updated and expected to be completed in 2021.

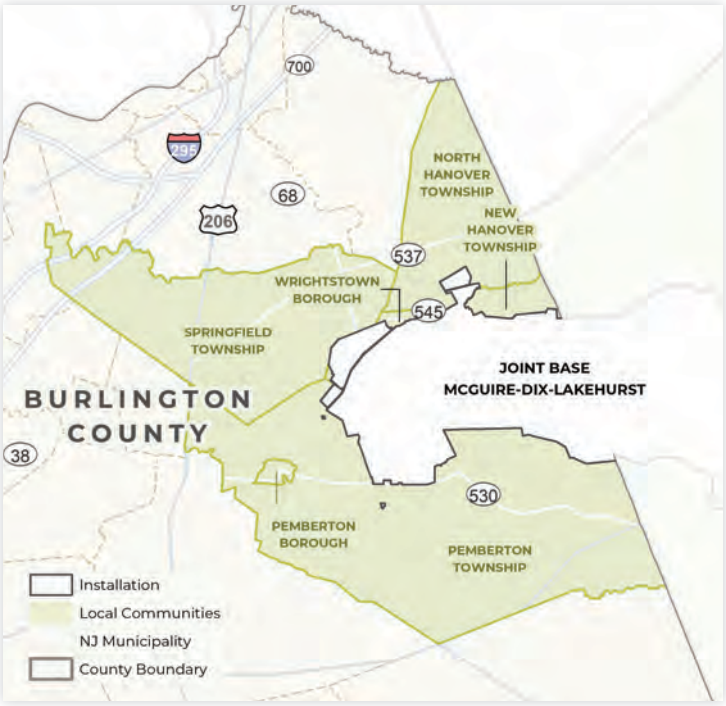
Jackson Township: The planning board prepares the master plan as a guidance document to be implemented by the township's governing body through land use ordinances. The *Jackson Township Master Plan* was updated in 2009 as a re-examination of land development policies and recommends a continuing planning process, in part, to align with the joint land use study's recommendation for frequent review. Acknowledging the importance of land use compatibility near JB MDL, the plan recommends working with the county and DoD to actively pursue development rights or acquisition mechanisms for farmland and other lands in the Whitesville and Grawtown Road areas (Jackson Township Planning Board, 2009).

Manchester Township: The Office of Planning and Zoning is responsible for all applications for development that come before either the planning board or the board of adjustment. The *2011 Master Plan,* which guides township development, is a comprehensive update of the *1993 Master Plan.* In addition to providing land use recommendations consistent with the *Pinelands Comprehensive Management Plan,* the plan also incorporates recommendations of the *Lakehurst Warfare Center AICUZ Plan.* To that end, the plan recommends coordinating efforts with the US military to support expanding airport runways and providing noise buffers (Township of Manchester, 2011). The plan was most recently re-examined in 2017.

Plumsted Township: The land use board ensures that building, zoning, and land use are consistent with the township master plan and ordinances. The *1995 Master Plan,* which was re-examined in 2016, focuses on maintaining the rural character of the township and encourages ongoing dialogue with nearby military installations for land use planning issues, as well as giving consideration to related noise and safety zones (Town of Plumsted, 1995).

Burlington County

The Board of Chosen Freeholders is the governing body for the county. In 2010, The Board of Chosen Freeholders identified a need to develop a plan that would achieve a balance of growth, development, and preservation in the region. *The Northern Burlington County Regional Growth and Preservation Plan* presents a broad-based approach to conservation, preservation, and growth that can be used as a guide by the county's 40 municipalities. The plan acknowledges JB MDL as an economic hub and includes in its vision maintaining compatible land use patterns to sustain current and future military missions. To achieve this vision, the plan recommends continued involvement with the joint land use study and implementing "Military Activity" notices to notify future property owners, residents, and businesses that JB MDL is an active military facility (Burlington County, 2010).



Borough of Wrightstown: A joint land use board manages planning and zoning for the borough. The *2011 Master Plan* is the policy document that guides the future physical, economic, and social development of the community. The master plan's vision statement is to have the borough serve as a true "Center" for the region, providing services to the community as well as those working at or visiting JB MDL (Borough of Wrightstown, 2011).

Borough of Pemberton: The Department of Community Development handles planning, zoning, code enforcement, and construction. The planning and zoning board evaluates land use applications with supporting documentation, which would be filed with the Office of the Borough Clerk. The current zoning map for the Borough of Pemberton was completed in July 2011 and revised in October 2011 as part of a re-examination report.

Springfield Township: Land use and zoning in the township are managed by separate planning and zoning boards. In 2010, the township's planning board conducted a re-examination of the *1996 Master Plan,* which had been previously reviewed in 2005. The re-examination was spurred by new legislation related to renewable energy development and alternative uses for agricultural land (Springfield Township, 2010).

New Hanover Township: New development is approved by the land use board but is generally discouraged by the township because there is an overall emphasis on preserving farmland in the township. The current zoning map for the township is from May 2018 and reflects large tracts of agricultural and preserved farmland.

North Hanover Township: The joint land use board reviews all land use proposals, and the township's zoning ordinance regulates land use, including maintaining the township's agricultural land and prohibiting incompatible uses. In 2016, the board re-examined the master plan, originally adopted in 2000; it was adopted by the joint land use board in June 2016.

Pemberton Township: In Pemberton Township, a planning board and zoning board manage land use and zoning. Planning services are provided by an outside firm. The master plan was adopted in July 2009 and underwent a re-examination in August 2014. There have been several sub-planning documents for Pemberton Township, including the *Browns Mills Town Center Redevelopment Plan,* which is specifically pertinent to this AICUZ Study as Browns Mills overlaps a portion of the AICUZ footprint. The *Browns Mills Town Center Redevelopment Plan* was originally adopted in 2011 and then reviewed and amended in March 2018.

6.3 LAND USE AND PROPOSED DEVELOPMENT

The land use compatibility analysis evaluates existing land uses and future land uses near JB MDL to determine compatibility conditions. Existing land use is assessed to determine current land use activity, while zoning is used to project development and potential growth areas. In addition, several municipalities incorporate future land uses (referred to as the land use planning element in New Jersey), which have been incorporated and discussed/presented in **Section 6.3.3.** For those municipalities that do not have future land use/land use planning element data, to be conservative, the existing land use or zoning category was included, whichever data set presented an higher level of development.

Land use and zoning geographic information system (GIS) data utilized were obtained from Burlington and Ocean counties, the 10 surrounding boroughs and townships noted above, and the Pinelands Commission. Much of the data was available electronically in GIS format; however, some municipal data was unavailable electronically (especially for the land use planning element) and therefore was digitized from provided master plan / comprehensive plan documents and zoning maps.

In order to analyze the compatibility of nearby land uses surrounding JB MDL, the use of each parcel of land is characterized into use categories. Shown below are broad use categories as defined by the FHWA SLUCM tables. While the specific categories used by each local government may vary, these generalized categories provide a starting point for each analysis and include the following:

- **Commercial:** Includes offices, retail stores, hospitality/restaurants, and other types of commercial establishments.
- **Residential:** Designations and zoning for family and private dwellings including rural/low-density development, medium-density, and high-density towers. Types of units include but are not limited to single family detached dwellings; duplex, triplex, and quadplexes; mobile homes or manufactured housing; and apartment buildings and condominiums.
- **Industrial:** Includes manufacturing, warehouses, and other similar uses.
- **Transportation/Communication/Utility:** Includes major and minor transportation systems and areas designated to support communication or other utilities.
- **Undeveloped:** Includes undeveloped parcels.
- **Public/Quasi-Public:** Includes publicly owned lands and utilities, and land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, and hospitals.
- **Open/Agricultural/Low Density:** Passive open spaces and agricultural areas.

Appendix A, Land Use Compatibility Tables, provides further description of the SLUCM land use categories along with notes on general allowable uses for JB MDL's surrounding jurisdictions.

Existing land use and parcel data provided by local communities were evaluated to ensure an actual account of land use activity regardless of conformity to zoning classification or designated planning or permitted use. Additionally, local management plans, policies, ordinances, and zoning regulations were evaluated to determine the type and extent of land use allowed in specific areas. Future land use data was evaluated to determine if there were areas within the AICUZ footprint or surrounding the installation where potentially incompatible developments are planned or would be allowed.

6.3.1 Existing Land Uses

JB MDL is located in a region that has pockets of development in boroughs and townships; however, the immediate area surrounding JB MDL is primarily undeveloped. Existing land use within the *2022 JB MDL AICUZ Study* footprint is illustrated on **Figure 6-2.**

Development around JB MDL extends along New Jersey state highways and the numerous county roads surrounding the installation. Developed areas around the JB MDL – McGuire portion of JB MDL include the Borough of Wrightstown and New Hanover Township to the north, which include commercial and residential uses along County Road 616, County Road 670, and other local roads. To the south, the Browns Mills area of Pemberton Township has moderately dense development, with both residential and commercial uses within two to three miles of the JB MDL property. Overall, development in these areas includes restaurants, retail shops, religious institutions, parks/recreational facilities, and residential development.

Immediately outside the JB MDL – Lakehurst side of JB MDL is the Borough of Lakehurst to the southeast and some development within Jackson Township to the northeast. There is a mix of residential, commercial, industrial, and undeveloped lands, as well as large areas that are designated as a preservation area district by the New Jersey Pinelands Commission and categorized and shown as Open/Agriculture/Low Density on **Figure 6-2.**

Areas of specific land use compatibility concerns within the JB MDL AICUZ footprint are further evaluated in **Section 6.4, Compatibility Concerns.**

6.3.2 Current (Existing) Zoning

Generally, the zoning data are consistent with the existing land use data, including primarily a combination of Open/Agriculture/Low Density development as well as Residential and some Public/Quasi-Public and Commercial development in pockets. More dense development occurs in planned subdivisions or population centers (boroughs/townships) adjacent to the installation. These areas are discussed in more detail in **Section 6.4.3.**

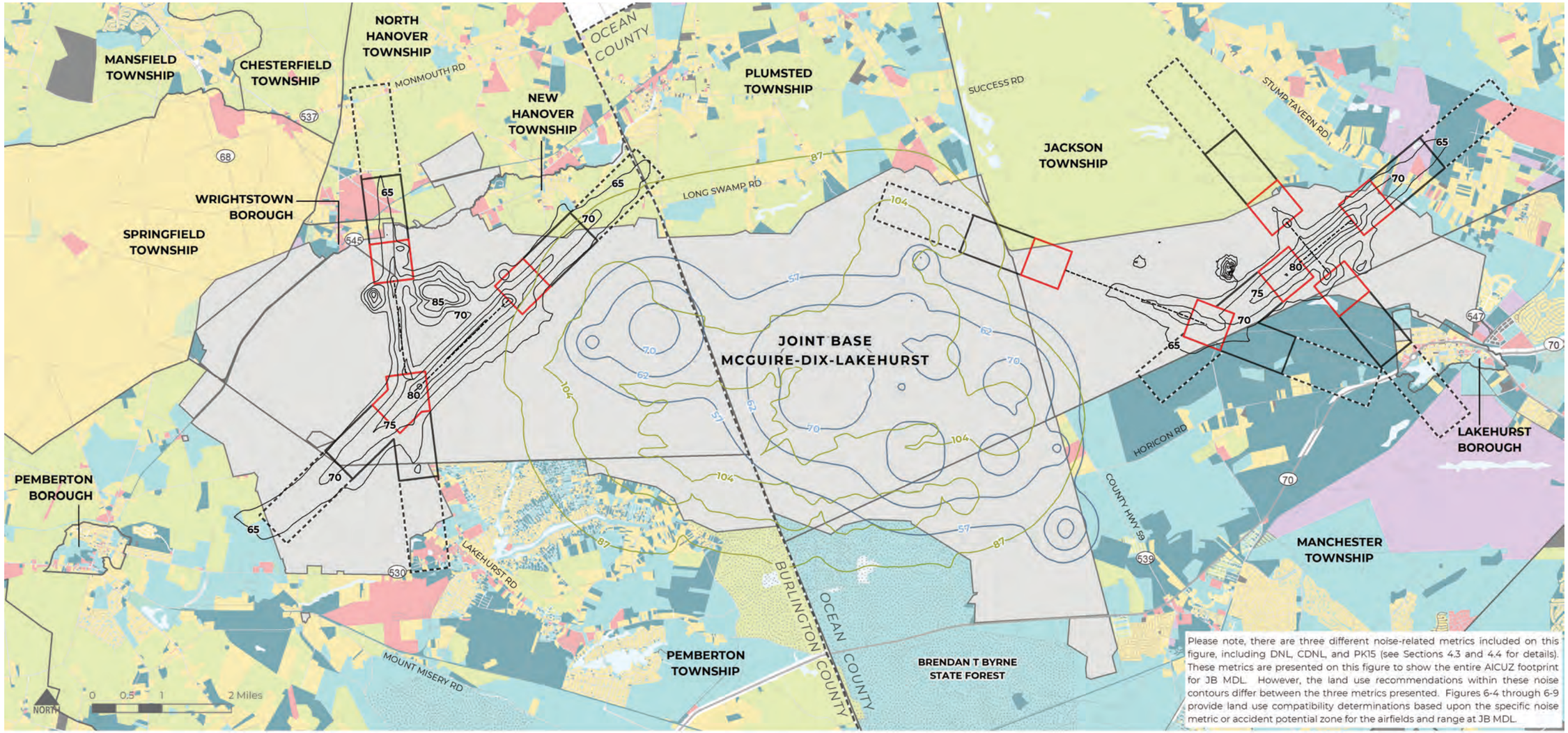
Existing zoning within the JB MDL 2022 AICUZ Study CZs, APZs, and noise zones associated with the airfields and range is illustrated on **Figure 6-3.**

6.3.3 Future Land Use

As noted previously, future land uses were captured from the land use planning elements for those municipalities surrounding JB MDL that had plans or data available. Most of this information was not available electronically and therefore it was digitized from municipal planning documents. Where municipalities did not have designated future land uses/land use planning elements, either the zoning or existing land use was used in its place, depending on which showed a higher level of potential development.

There are a few differences when comparing the existing land uses to future land uses, including a higher degree of potential residential development particularly in Pemberton Township and Jackson Township. However, in other areas the future land uses generally consistent with the existing land uses in terms of where development is taking place and the areas that are generally open and/or undeveloped.

Future land uses within the *JB MDL 2022 AICUZ Study* CZs, APZs, and noise zones associated with the airfields and range is illustrated on **Figure 6-4.**



Please note, there are three different noise-related metrics included on this figure, including DNL, CDNL, and PK15 (see Sections 4.3 and 4.4 for details). These metrics are presented on this figure to show the entire AICUZ footprint for JB MDL. However, the land use recommendations within these noise contours differ between the three metrics presented. Figures 6-4 through 6-9 provide land use compatibility determinations based upon the specific noise metric or accident potential zone for the airfields and range at JB MDL.

- Runway
- Installation
- Local Communities
- NJ Municipality
- County Boundary
- State Park or Forest
- Water Body
- Clear Zone (CZ)
- Accident Potential Zone I (APZ I)
- Accident Potential Zone II (APZ II)
- Airfield Noise Contours (DNL)
- Range Large-Caliber Noise Contours (CDNL)
- Range Small-Arms Peak Noise Contours (PK15)

EXISTING LAND USE KEY

Commercial
Includes offices, retail stores, hospitality/restaurants, and other types of commercial establishments.

Industrial
Includes manufacturing, warehouses, and other similar uses.

Open/Agriculture/Low Density
Passive open space, agricultural areas, and areas with residential activity.

Public/Quasi-public
Includes publicly owned lands and utilities and land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.

Recreation
Land areas designated for recreational activity, such as parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, etc.

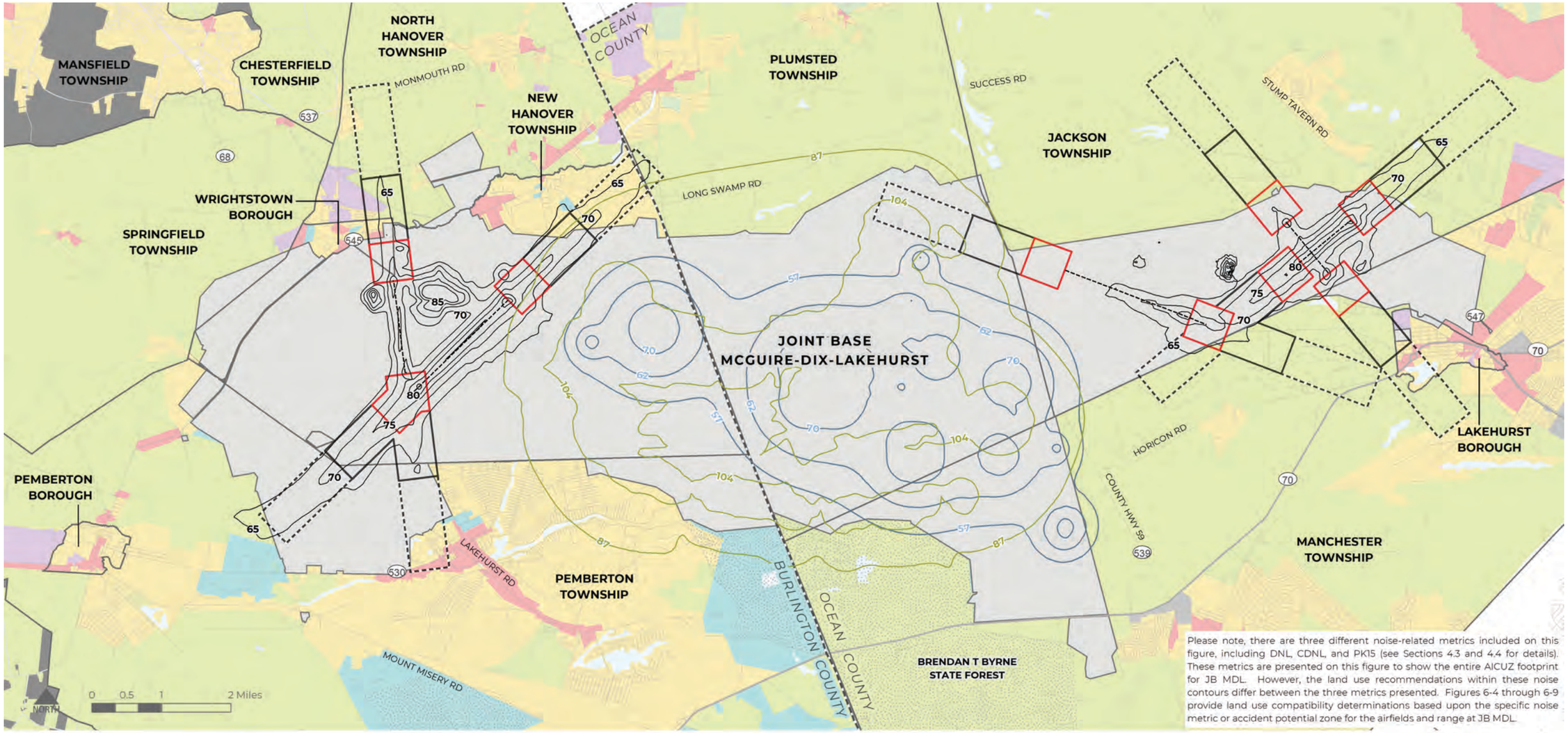
Residential
Includes all types of residential activity, such as single- and multi-family residences and rural residential, mobile homes.

Transportation/Utility
Includes major and minor transportation systems and areas designated to support utilities.

Undeveloped
Includes undeveloped parcels and some parcels that had no indicated value or were listed as "undesignated" in the original datasets.

Undesignated
This land use is not found within the composite AICUZ footprint.

Figure 6-2 Existing Land Use and 2022 AICUZ Study Noise Contours, CZs, and APZs for JB MDL



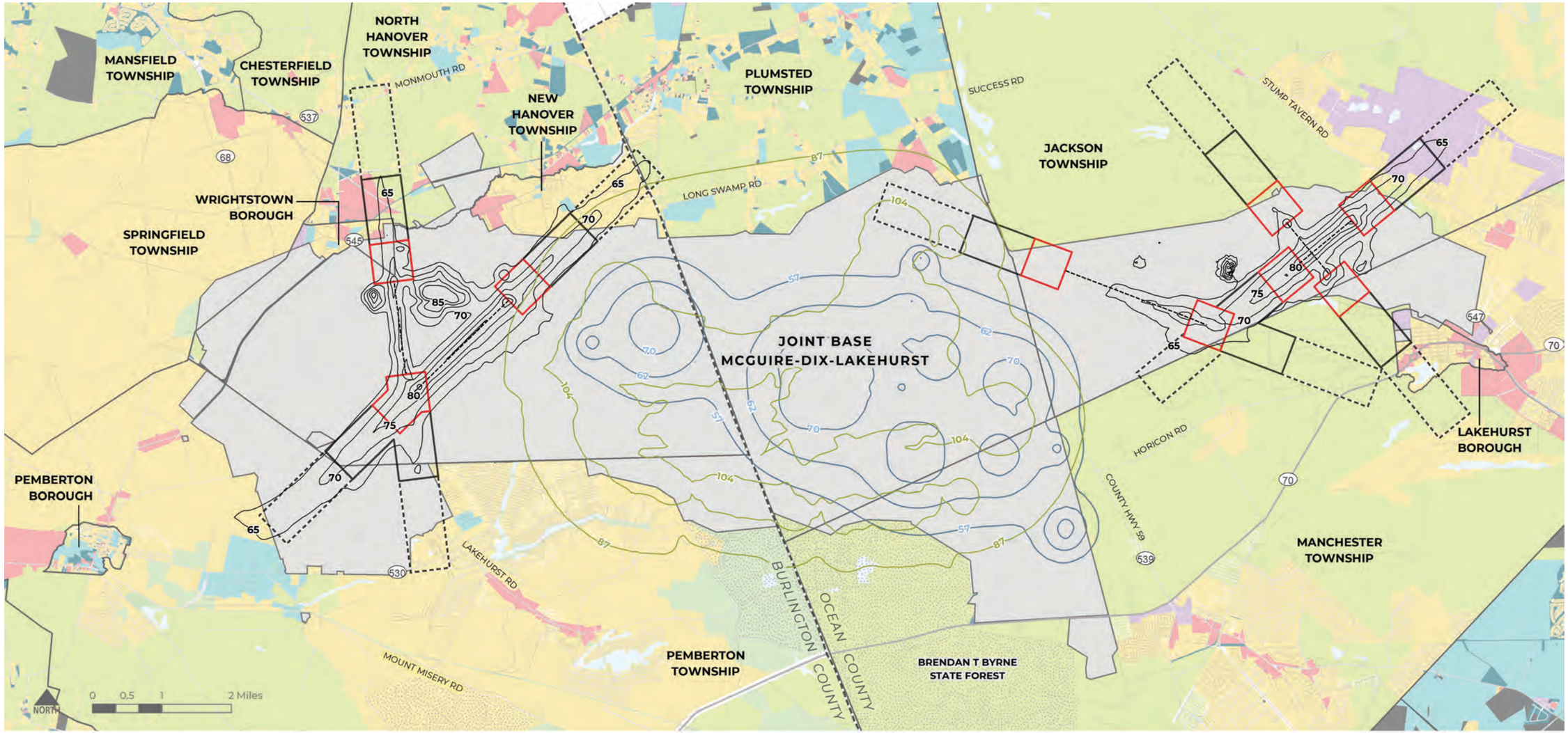
Please note, there are three different noise-related metrics included on this figure, including DNL, CDNL, and PK15 (see Sections 4.3 and 4.4 for details). These metrics are presented on this figure to show the entire AICUZ footprint for JB MDL. However, the land use recommendations within these noise contours differ between the three metrics presented. Figures 6-4 through 6-9 provide land use compatibility determinations based upon the specific noise metric or accident potential zone for the airfields and range at JB MDL.

- Runway
- Installation
- Local Communities
- NJ Municipality
- County Boundary
- State Park or Forest
- Water Body
- Clear Zone (CZ)
- Accident Potential Zone I (APZ I)
- Accident Potential Zone II (APZ II)
- Airfield Noise Contours (DNL)
- Range Large-Caliber Noise Contours (CDNL)
- Range Small-Arms Peak Noise Contours (PK15)

EXISTING ZONING KEY

- **Commercial** Includes offices, retail stores, hospitality/restaurants, and other types of commercial establishments.
- **Industrial** Includes manufacturing, warehouses, and other similar uses.
- **Open/Agriculture/Low Density** Passive open space, agricultural areas, and areas with residential activity.
- **Public/Quasi-public** Includes publicly owned lands and utilities and land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.
- **Recreation** Land areas designated for recreational activity, such as parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, etc.
- **Residential** Includes all types of residential activity, such as single- and multi-family residences and rural residential, mobile homes.
- **Transportation/Utility** Includes major and minor transportation systems and areas designated to support utilities.
- **Undeveloped** Includes undeveloped parcels and some parcels that had no indicated value or were listed as "undesignated" in the original datasets.
- **Undesignated** This land use is not found within the composite AICUZ footprint.

Figure 6-3 Existing Zoning and 2022 AICUZ Study Noise Contours, CZs, and APZs for JB MDL



- Runway
- Installation
- Local Communities
- NJ Municipality
- County Boundary
- State Park or Forest
- Water Body
- Clear Zone (CZ)
- Accident Potential Zone I (APZ I)
- Accident Potential Zone II (APZ II)
- Airfield Noise Contours (DNL)
- Range Large-Caliber Noise Contours (CDNL)
- Range Small-Arms Peak Noise Contours (PK15)

FUTURE LAND USE KEY

Commercial
Includes offices, retail stores, hospitality/restaurants, and other types of commercial establishments.

Industrial
Includes manufacturing, warehouses, and other similar uses.

Open/Agriculture/Low Density
Passive open space, agricultural areas, and areas with residential activity.

Public/Quasi-public
Includes publicly owned lands and utilities and land to which the public has access, including military reservations and training grounds, public buildings, schools, churches, cemeteries, and hospitals.

Recreation
Land areas designated for recreational activity, such as parks, wilderness areas and reservations, conservation areas, and areas designated for trails, hikes, camping, etc.

Residential
Includes all types of residential activity, such as single- and multi-family residences and rural residential, mobile homes.

Transportation/Utility
Includes major and minor transportation systems and areas designated to support utilities.

Undeveloped
Includes undeveloped parcels and some parcels that had no indicated value or were listed as "undesignated" in the original datasets.

Undesignated
This land use is not found within the composite AICUZ footprint.

Figure 6-4 Future Land Use and 2022 AICUZ Study Noise Contours, CZs, and APZs for JB MD

6.4 COMPATIBILITY CONCERNS

6.4.1 Land Use Analysis

Land use describes how land is developed and managed, and is characterized by the dominant function occurring within an area. There are multiple jurisdictions surrounding JB MDL, each with different land use and zoning classifications. To compare land use consistently across jurisdictions, this analysis uses generalized land use classifications illustrating land use compatibility across common land use types. These generalized land use categories are not exact representations of the local community's land use designations but combine similar land uses such as those introduced in Section 6.3, Land Use and Proposed Development.

For the purpose of this analysis, the DoD AICUZ compatibility guidelines (Tables A-1, A-2, and A-3 of Appendix A) utilize the SLUCM standards to provide generalized land use classifications. Table 6-1 provides generalized compatibility guidelines for the SLUCM categories for noise and safety related to airfields, while Table 6-2 presents generalized compatibility guidelines for small-arms noise associated with JB MDL – Dix. Table 6-3 presents generalized compatibility guidelines for large-caliber weapons and artillery/explosive noise associated with JB MDL – Dix.

Land use compatibility falls into one of four categories: (1) compatible; (2) compatible with restrictions; (3) incompatible; and (4) incompatible with exceptions. Residential uses are considered incompatible within the greater than 65 dB DNL noise contours. If residential

Table 6-1 Generalized Land Use Categories and Aircraft Noise/Safety Compatibility[1]

Generalized Land Use Category	Noise Zone (dB DNL)								
	<65	65-69	70-74	75-79	80-85	85+	CZ	APZ I	APZ II
Residential	Yes	No[2]	No[2]	No	No	No	No	No	No[3]
Commercial	Yes	Yes	Yes[4]	Yes[4]	No	No	No	Yes[4]	Yes[4]
Industrial	Yes	Yes	Yes	Yes	Yes[2]	No	No	Yes[4]	Yes[4]
Public/Quasi-Public	Yes	Yes[4]	Yes[4]	Yes[4]	No	No	No	No	Yes[4]
Open/Agriculture/Low Density	Yes	Yes[4]	Yes[4]	Yes[4]	Yes[4]	Yes[4]	No	Yes[4]	Yes[4]
Transportation/Communication/Utilities	Yes	Yes	Yes	Yes	Yes	No	No	Yes[4]	Yes
Undeveloped	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Adapted from AFH 32-7084. **Key:** Compatible; Compatible with Restrictions; Incompatible

Notes:

[1] This generalized table demonstrates the land compatibility guidelines. Refer to Appendix A for use in determining land use compatibility.

[2] Residential land uses within the greater than 65 dB DNL noise contours are considered incompatible. However, if residential uses are considered essential, noise-attenuation measures should be incorporated into the building structures.

[3] Residential land uses in APZ II are considered incompatible, with the exception of two dwellings per acre.

[4] Compatible with restrictions.

Table 6-2 Generalized Land Use Compatibility for Small-Arms Noise[1]

Generalized Land Use Category	Land Use Compatibility with Noise Zone dB Peak Pressure (dB PK15 [met])		
	Noise Zone I <87 dB PK15 (met)	Noise Zone II 87-104 dB PK15 (met)	Noise Zone III >104 dB PK15 (met)
Residential	Yes	No[2]	No
Commercial	Yes	Yes[3]	Yes[3]
Industrial	Yes	Yes[3]	Yes[3]
Public/Quasi-Public	Yes	Yes[3]	Yes[3]
Open/Agriculture/Low Density	Yes	Yes[3]	Yes[3]
Transportation/Communication/Utilities	Yes	Yes[3]	Yes[3]
Undeveloped	Yes	Yes	Yes

Source: Adapted from AFH 32-7084. **Key:** Compatible Compatible with Restrictions Incompatible

Notes:

[1] This generalized land use table provides an overview of recommended land uses. To determine specific land use compatibility, see Appendix A.

[2] Residential land uses within the 87-104 dB PK15 noise contours are considered incompatible. However, if residential uses are considered essential, noise-attenuation measures should be incorporated into the building structures.

[3] Compatible with restrictions.

Table 6-3 Generalized Land Use Compatibility for Large-Caliber Weapon and Artillery/Explosive Noise[1]

Generalized Land Use Category	Land Use Compatibility with Noise Zone C-weighted Day-Night Average Sound Level (CDNL)		
	LUPZ[2] 57-62 (CDNL)	Noise Zone II 62-70 (CDNL)	Noise Zone III >70 (CDNL)
Residential	Yes	No[3]	No
Commercial	Yes	Yes	No
Industrial	Yes	Yes[4]	Yes[4]
Public/Quasi-Public	Yes	No[3]	No
Open/Agriculture/Low Density	Yes	Yes[4]	Yes[4]
Transportation/Communication/Utilities	Yes	Yes	Yes[4]
Undeveloped	Yes	Yes	Yes

Source: Adapted from AFH 32-7084. **Key:** Compatible Compatible with Restrictions Incompatible

Notes:

[1] This generalized land use table provides an overview of recommended land uses. To determine specific land use compatibility, see Appendix A.

[2] LUPZ (Land Use Planning Zone) is an area in which its implemented controls function to create a buffer for Noise Zone II to prevent possibility of future noise conflicts.

[3] Residential land uses within the 62-70 CDNL noise contours are considered incompatible. However, if residential uses are considered essential, noise-attenuation measures should be incorporated into the building structures. Similarly, Public/Quasi-public land uses, which could include schools/educational facilities, are considered incompatible, and similar noise-attenuation measures should be incorporated.

[4] Compatible with restrictions.

uses are considered essential within the greater than 65 dB DNL noise contours, it is highly recommended that noise-attenuation measures be incorporated into the structure. Residential uses are discouraged within the 65-69 dB DNL noise contour and are highly discouraged within the 70-74 dB DNL noise contour. Other non-residential uses may be considered compatible with restrictions, which also relate to noise-attenuation measures and density limitation. For residential land uses within APZ II, a density limit of two dwellings per acre should be followed.

Similarly, as noted in **Tables 6-2 and 6-3,** residential land uses are considered incompatible within the 87-104 dB PK15 (Noise Zone II) for small-arms noise and within the 62-70 CDNL (Noise Zone II) for large-caliber weapons noise, and if residential land uses are considered essential, noise-attenuation measures should be incorporated into building structures.

This AICUZ Study analyzes both existing land use compatibility **(Section 6.4.2)** as well as future land use compatibility **(Section 6.4.3)** for both aircraft and training range noise contours, as well as with CZs and APZs associated with the airfields. In order to determine the compatibility of a specific area, the user must consider both the noise contours and the CZ and APZs that apply to that specific area. In addition, the Air Force recommends coordination between the land use jurisdictions and JB MDL for land areas within the AICUZ footprint and adjacent properties.

Water features were added to the existing land use, future land use, and zoning figures **(Figures 6-2, 6-3 and 6-4 above)** for reference and purposes of orientation; however, the land use and zoning data from the municipalities typically does not include water features. Therefore, the compatibility analysis beginning in the following section is based upon the original municipality data that does not account for water features.

6.4.2 Existing Land Use Compatibility Concerns

JB MDL's 2022 AICUZ footprint overlays areas off the installation that may pose a compatibility concern with certain types of existing land uses. While the vast majority of impact areas are on military land or over undeveloped/forested areas, some areas of the local community are located within these noise contours and/or APZs. In certain instances where data showed off-installation lands as public/quasi-public, but were within a Federal, State or local program that protected it from future development, these areas were designated as "undeveloped" for the compatibility analysis.

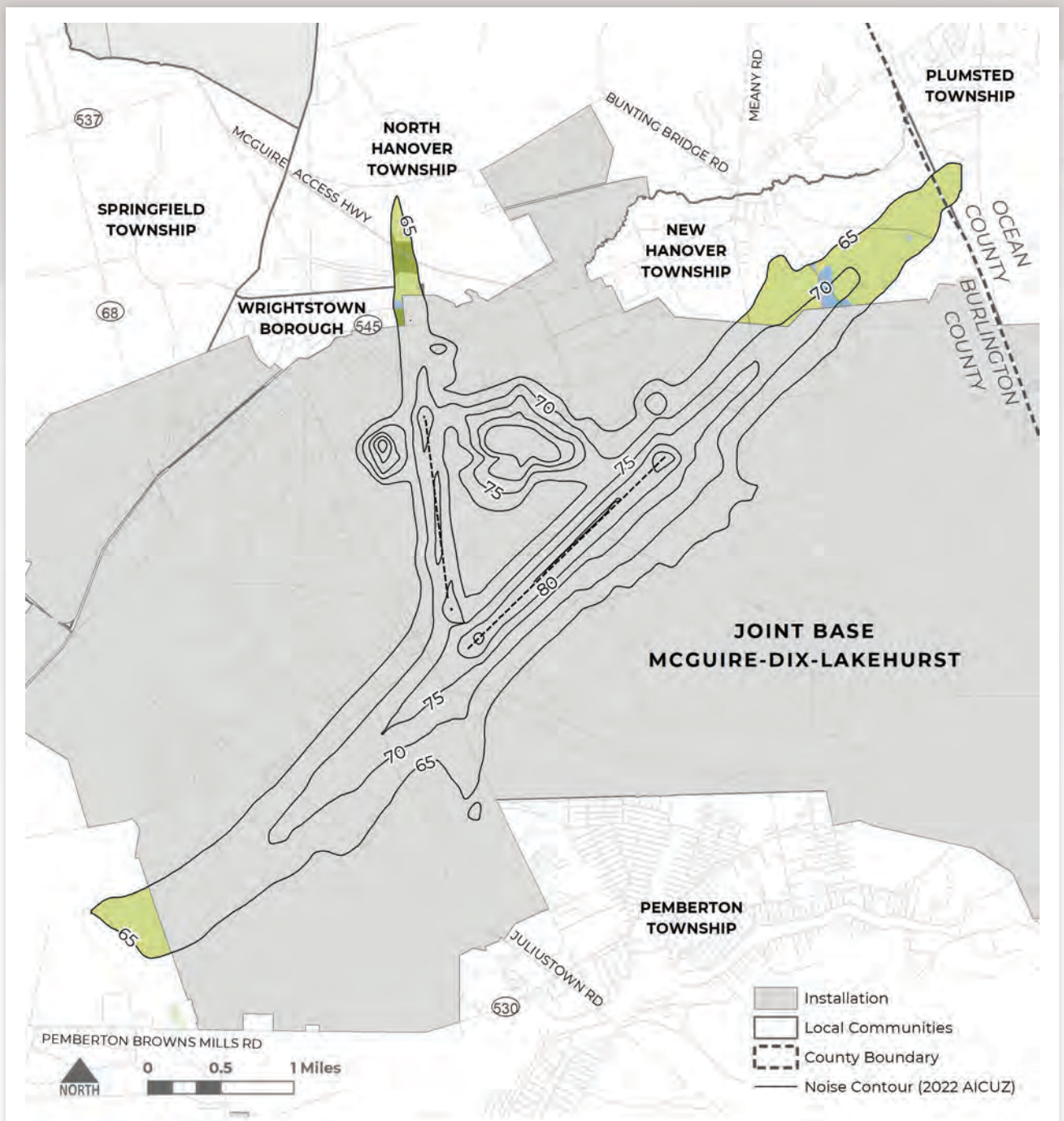
For analysis purposes, the existing land use compatibility analysis is divided into two main discussions, with subcategories for noise:

1. **Compatibility Concerns within Noise Contours**
   - **Airfield noise contours** associated with JB MDL – McGuire and JB MDL – Lakehurst
   - **Range noise contours** associate **small-arms** training
   - **Range noise contours** associated with **large-caliber/explosive weapons**
2. **Compatibility Concerns within the APZs associated with JB MDL – McGuire and JB MDL – Lakehurst**

6.4.2.1 Compatibility Concerns within Noise Contours

6.4.2.1.1 JB MDL Noise Contours (DNL)

Figures 6-5 and 6-6 illustrate the compatibility of existing land uses within the noise contours associated with, respectively, JB MDL – McGuire and JB MDL – Lakehurst.



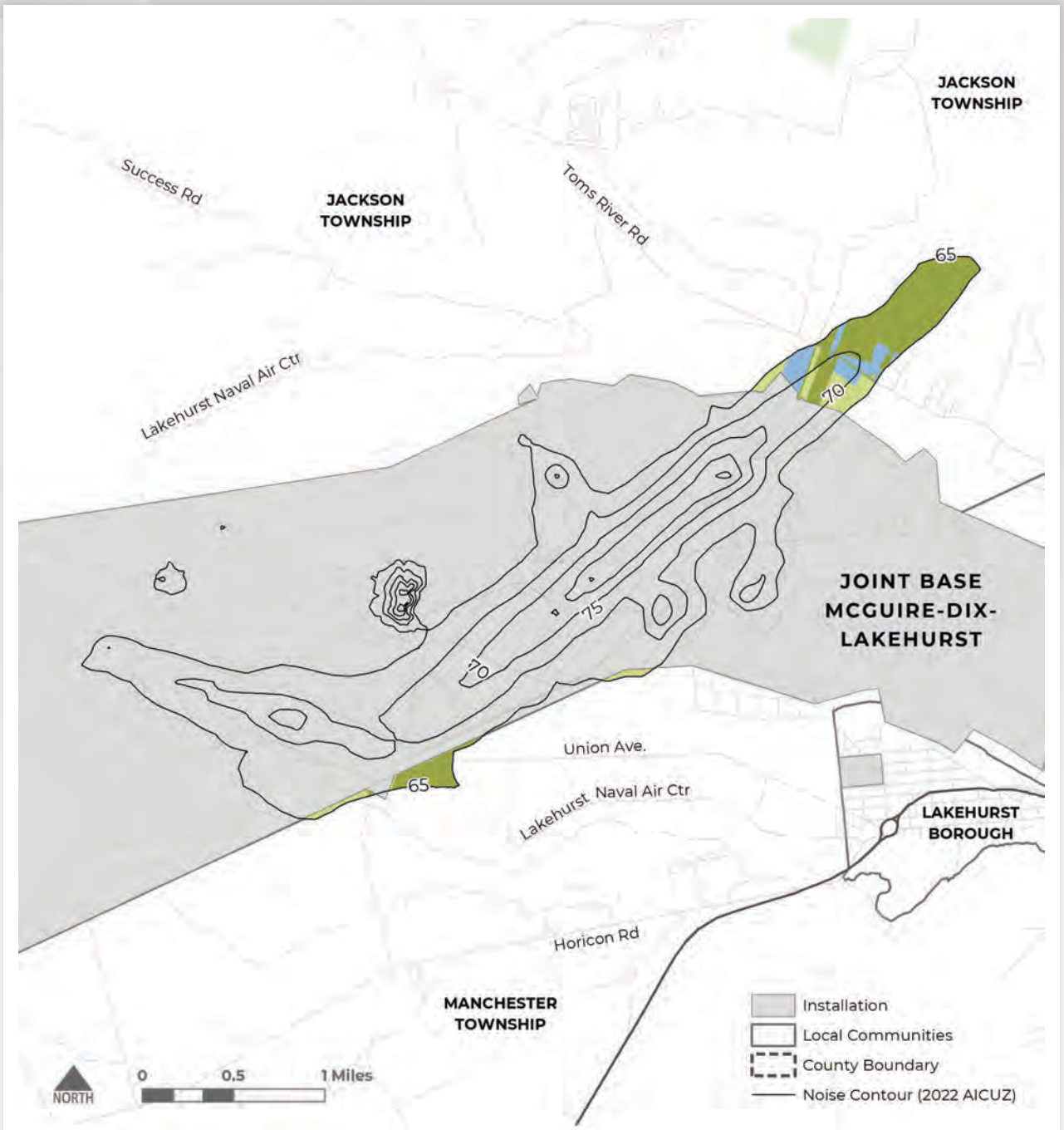
EXISTING LAND USE COMPATIBILITY

Compatible
All land uses are compatible without restrictions.

Compatible with Restrictions
Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the noise contours and would require the incorporation of noise attenuation measures into the design and construction of structures in order to be deemed compatible.

Incompatible with Exceptions
Residential uses in noise zones are considered incompatible; however, if residential uses are considered essential, noise attenuation measures should be incorporated into building structures.

Figure 6-5 Incompatible Existing Land Uses within Noise Contours for JB MDL – McGuire



EXISTING LAND USE COMPATIBILITY

Compatible
All land uses are compatible without restrictions.

Compatible with Restrictions
Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the noise contours and would require the incorporation of noise attenuation measures into the design and construction of structures in order to be deemed compatible.

Incompatible with Exceptions
Residential uses in noise zones are considered incompatible; however, if residential uses are considered essential, noise attenuation measures should be incorporated into building structures.

Figure 6-6 Incompatible Existing Land Uses within Noise Contours for JB MDL – Lakehurst

Table 6-4 Off-Installation Existing Land Use Acreage within AICUZ Noise Zones

Designation	Generalized Land Use Category[1]	60-64	65-69	70-74	75-79	80+	Total
JB MDL – McGuire							
Incompatible or Incompatible with Exceptions	Residential	14.46	8.6	—	—	—	**23.06**
	Commercial	—	—	—	—	—	—
	Industrial	—	—	—	—	—	—
	Public/Quasi-Public	—	—	—	—	—	—
	Transportation/Utility	—	—	—	—	—	—
	Open/Agriculture/Low Density	—	—	—	—	—	—
	Undeveloped	—	—	—	—	—	—
Compatible or Compatible with Restrictions	Residential	—	—	—	—	—	—
	Commercial	22.59	—	—	—	—	**22.59**
	Industrial	—	—	—	—	—	—
	Public/Quasi-Public	53.69	1.12	—	—	—	**54.81**
	Transportation/Utility	7.42	0.82	—	—	—	**8.25**
	Open/Agriculture/Low Density	395.89	24.78	—	—	—	**420.67**
	Undeveloped	1.45		—	—	—	**1.45**
Sub Total	**Incompatible**	**14.46**	**8.6**	**—**	**—**	**—**	**23.06**
	Compatible	**481.04**	**26.72**	**—**	**—**	**—**	**507.76**
JB MDL – Lakehurst							
Incompatible or Incompatible with Exceptions	Residential	29.52	10.49	—	—	—	**40.01**
	Commercial	—	—	—	—	—	—
	Industrial	—	—	—	—	—	—
	Public/Quasi-Public	—	—	—	—	—	—
	Transportation/Utility	—	—	—	—	—	—
	Open/Agriculture/Low Density	—	—	—	—	—	—
	Undeveloped	—	—	—	—	—	—
Compatible or Compatible with Restrictions	Residential	—	—	—	—	—	—
	Commercial	27.47	3.04	—	—	—	**30.51**
	Industrial	73.46	1.43	—	—	—	**74.90**
	Public/Quasi-Public	40.51	9.69	—	—	—	**50.20**
	Transportation/Utility	3.84	2.03	—	—	—	**5.87**
	Open/Agriculture/Low Density	0.16	0.03	—	—	—	**0.19**
	Undeveloped	69.52	13.30	—	—	—	**82.81**
Sub Total	**Incompatible**	**29.52**	**10.49**	**—**	**—**	**—**	**40.01**
	Compatible	**214.96**	**29.52**	**—**	**—**	**—**	**244.48**
JB MDL Total							
	Incompatible	**43.98**	**19.09**	**—**	**—**	**—**	**63.07**
	Compatible	**696.00**	**56.24**	**—**	**—**	**—**	**752.24**
Total		**739.98**	**75.33**	**0**	**0**	**0**	**815.31**

Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details.

The following presents an overview of the prominent land use types and their compatibility within JB MDL's noise zones surrounding the installation.

Approximately 531 acres of off-installation property is associated with the greater than 65 dB DNL noise contours for JB MDL – McGuire. Of this total, approximately 508 acres (or about 96 percent) is considered compatible, including conditionally compatible (compatible with restrictions) with aircraft operations.

The greater than 65 dB DNL noise contours associated with JB MDL – Lakehurst extend over approximately 285 acres of off-installation property. Similarly, the majority of the land within the noise contours (approximately 244 acres, or 86 percent) is considered compatible, including those considered conditionally compatible (compatible with restrictions) with aircraft operations.

A list of off-installation land use acreages within the noise zones by land use category is found in **Table 6-4.** A more detailed discussion of general land uses within the JB MDL noise zones associated with both JB MDL – McGuire and JB MDL – Lakehurst is provided in **Section 6.4.3,** with specific focus on areas of development in the noise contours.

6.4.2.1.2 JB MDL – Dix Noise Contours (Small Arms [PK15])

Figure 6-7 presents the compatibility of existing land use for the peak-noise contours associated with small-arms training at JB MDL – Dix. The noise contours associated with small-arms training extend off installation to property to the north and south. The following is an overview of the prominent land use types and their compatibility within these noise contours.

Approximately 4,717 acres of off-installation property is within the 87 dB PK15 noise contour. Areas outside of the 87 dB PK15 noise contour are referred to as "Noise Zone I" and are considered compatible and serve as a buffer. The greater than 104 dB PK15 noise contour covers approximately 193 acres. Overall, as shown in **Table 6-5,** approximately 3,837 acres (or 81 percent) of the land uses within these noise contours are considered compatible, including conditionally compatible (compatible with restrictions) with small-arms range operations. The 881 acres that are considered incompatible are residential land uses to the north (along Long Swamp Road as well as some of the smaller roads extending to the south, such as Brindletown Road and Cranberry Canners Road) and areas to the south in Browns Mills and around Mirror Lake (specifically, along Hanover Boulevard and the various interior residential streets in this neighborhood).

A list of off-installation land use acreages within the noise zones by land use category are found in **Table 6-5.** A more detailed discussion of general land uses within the JB MDL – Dix noise zones is provided in **Section 6.4.3,** with specific focus on areas of development in the noise zones to the north and south of the range area.

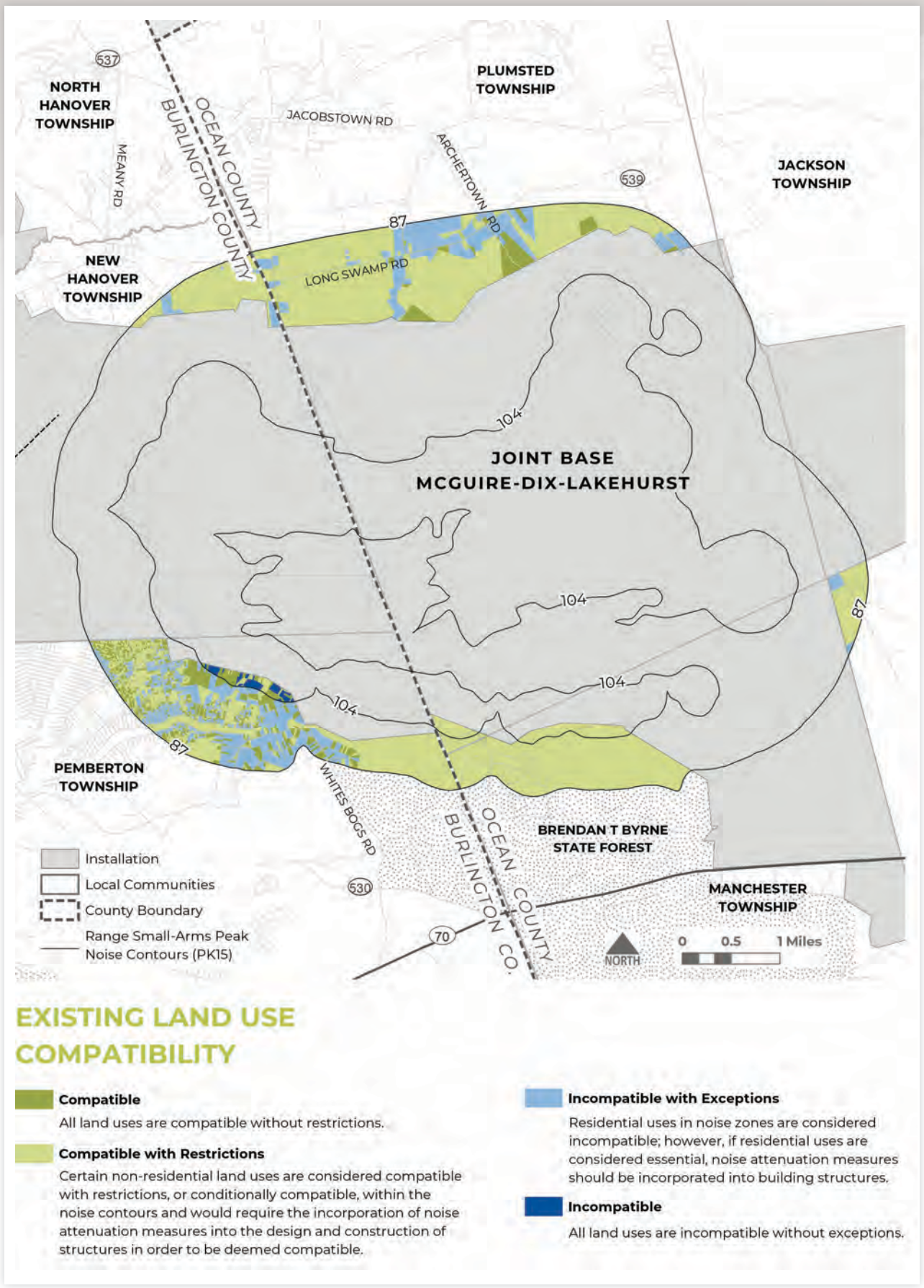


Figure 6-7 Incompatible Existing Land Use within Small-Arms (PK15) Noise Contours for JB MDL – Dix

Table 6-5 Off-Installation Existing Land Use Acreage within Live Small-Arms Peak Noise Contours (PK15)

Designation	Generalized Land Use Category[1]	Noise Zones: Noise Zone I (<87 dB PK15)[2]	Noise Zone II (87-104 dB PK15)	Noise Zone III (>104 dB PK15)	Total
JB MDL – Dix					
Incompatible or Incompatible with Exceptions	Residential	—	848.76	31.94	**880.7**
	Commercial	—	—	—	—
	Industrial	—	—	—	—
	Public/Quasi-Public	—	—	—	—
	Transportation/Utility	—	—	—	—
	Open/Agriculture/Low Density	—	—	—	—
	Undeveloped	—	—	—	—
Compatible or Compatible with Restrictions	Residential	—	—	—	—
	Commercial	—	121.72		**121.72**
	Industrial	—	—	—	—
	Public/Quasi-Public	—	1,432.97	131.29	**1,564.26**
	Transportation/Utility	—	181.88	2.41	**184.29**
	Open/Agriculture/Low Density	—	1,571.19	—	**1,571.19**
	Undeveloped	—	367.83	27.34	**395.17**
Sub Total	**Incompatible**	**—**	**848.76**	**31.94**	**880.7**
	Compatible	**—**	**3,675.59**	**161.04**	**3,836.63**
Total		**0**	**4,524.35**	**192.98**	**4,717.33**

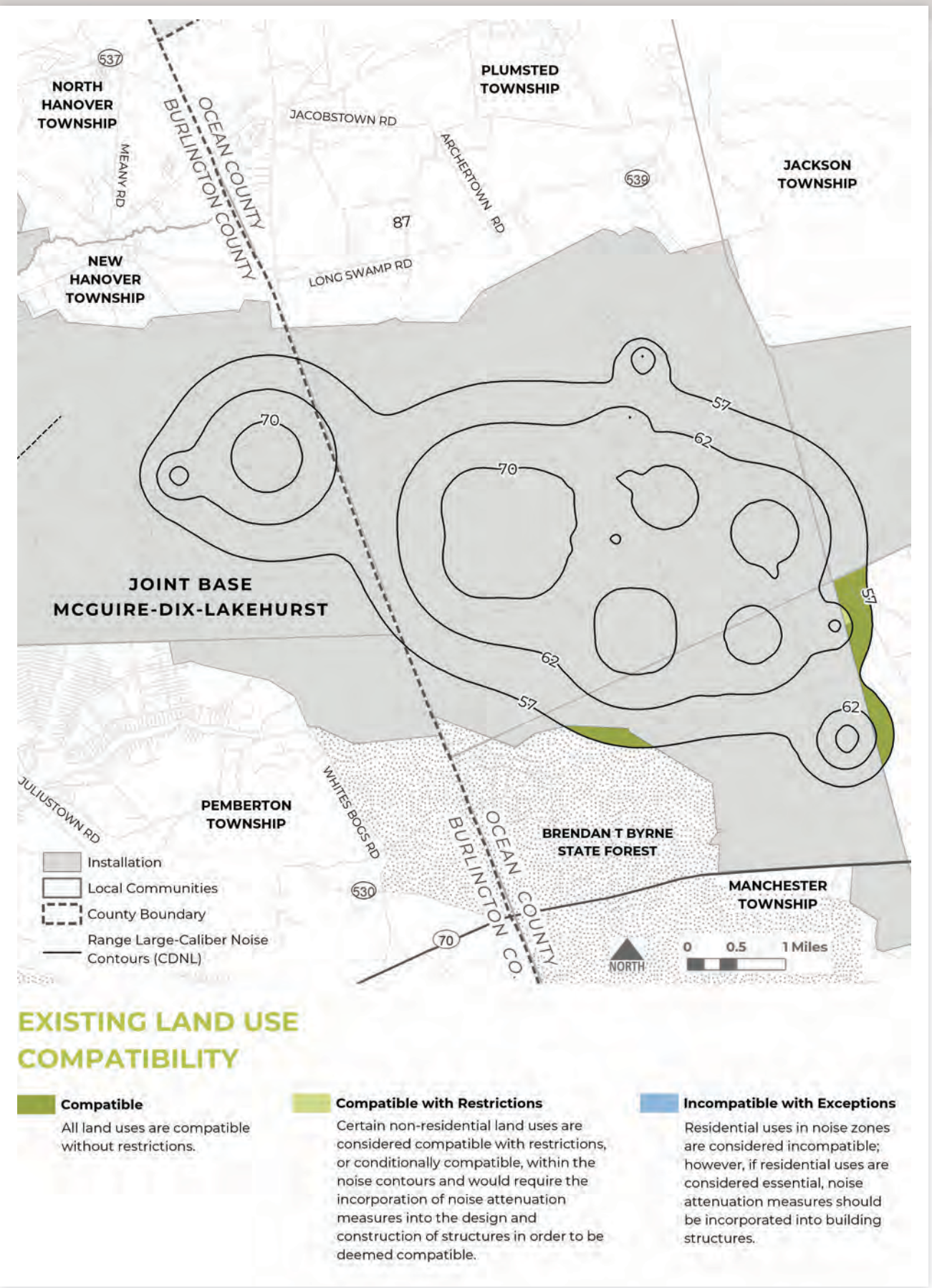
Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details.
[2] Acreages in Noise Zone I are not quantified because this area entails anything outside of the 87 dB PK15 contour. In addition, all areas in Noise Zone I are considered compatible.

6.4.2.1.3 JB MDL – Dix Noise Contours (Large-caliber Weapons and Explosives [CDNL])

Figure 6-8 illustrates the compatibility of existing land uses for the C-weighted day-night average sound level (CDNL) noise contours associated with large-caliber weapons and explosives training at JB MDL – Dix. The noise contours associated with large-caliber weapons and explosives training extend off installation property to the north and south. The following presents an overview of the prominent land use types and their compatibility within these noise contours.

Approximately 308 acres of off-installation property is within the 57 dB CDNL noise contour, with only 13 acres in the 62-70 dB CDNL noise contour; the greater than 70 dB CDNL contour falls within the installation boundary. The vast majority of the land area covered, approximately 306 acres, or 99 percent, is considered compatible, including conditionally compatible (compatible with restrictions) with large-caliber weapon range operations.

A list of off-installation land use acreages within the noise zones by land use category is found in Table 6-6. A more detailed discussion of general land uses within the JB MDL – Dix noise zones and inset maps is provided in Section 6.4.3.



EXISTING LAND USE COMPATIBILITY

Compatible
All land uses are compatible without restrictions.

Compatible with Restrictions
Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the noise contours and would require the incorporation of noise attenuation measures into the design and construction of structures in order to be deemed compatible.

Incompatible with Exceptions
Residential uses in noise zones are considered incompatible; however, if residential uses are considered essential, noise attenuation measures should be incorporated into building structures.

Figure 6-8 Incompatible Existing Land Uses within Large-Caliber Weapons and Explosives (CDNL) Noise Contours for JB MDL – Dix

Table 6-6 Off-Installation Existing Land Use Acreage within Large-Caliber Weapons and Explosives Noise Contours (CDNL)

Designation	Generalized Land Use Category[1]	Noise Zones: LUPZ 57-62 (CDNL)	Noise Zone II 62-70 (CDNL)	Noise Zone III >70 (CDNL)	Total
JB MDL – Dix					
Incompatible or Incompatible with Exceptions	Residential	—	—	—	—
	Commercial	—	—	—	—
	Industrial	—	—	—	—
	Public/Quasi-Public	—	1.90	—	**1.90**
	Transportation/Utility	—	—	—	—
	Open/Agriculture/Low Density	—	—	—	—
	Undeveloped	—	—	—	—
Compatible or Compatible with Restrictions	Residential	32.31	—	—	**32.31**
	Commercial	33.70	4.84	—	**38.54**
	Industrial		—	—	—
	Public/Quasi-Public	190.17	—	—	**190.17**
	Transportation/Utility	4.55	—	—	**4.55**
	Open/Agriculture/Low Density	33.48	6.66	—	**40.14**
	Undeveloped	—	—	—	—
Sub Total	**Incompatible**	**—**	**1.90**	**—**	**1.90**
	Compatible	**294.21**	**11.5**	**—**	**305.71**
Total		**294.21**	**13.4**	**0**	**307.61**

Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details.

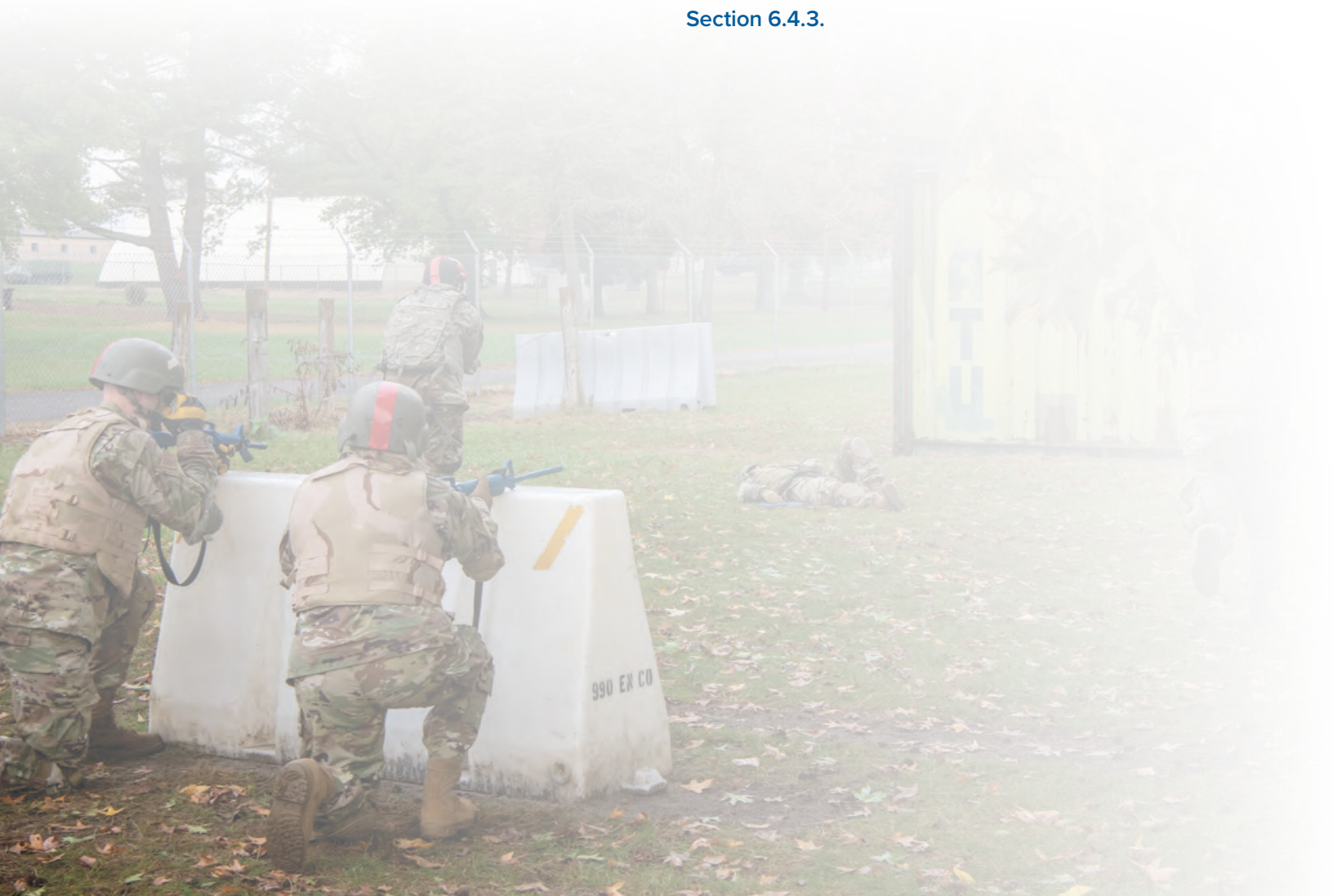
6.4.2.2 Compatibility Concerns within APZs

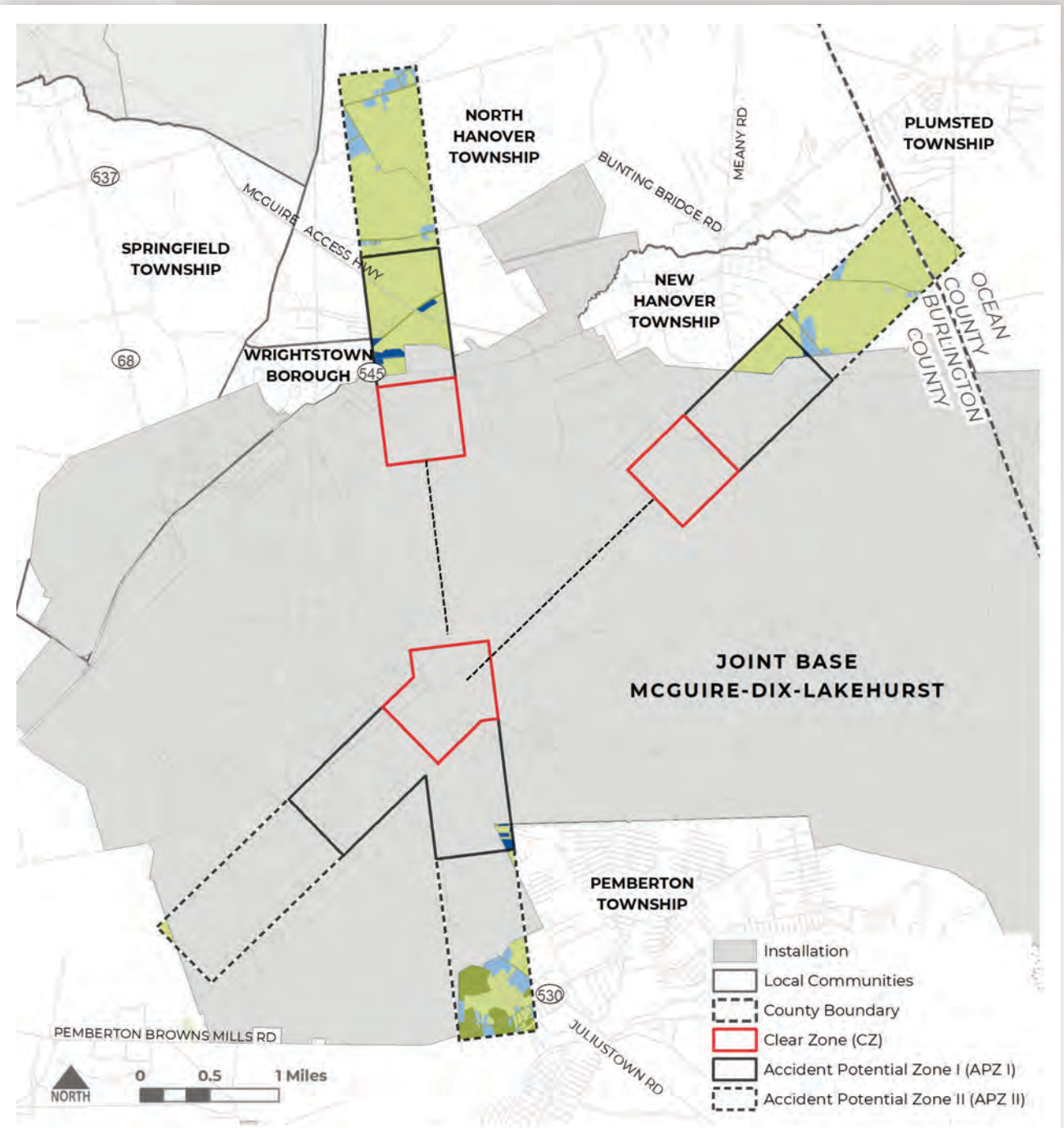
Figures 6-9 and 6-10 illustrate the compatibility of existing land uses within the CZs and APZs associated with, respectively, JB MDL – McGuire and JB MDL – Lakehurst. The following is an overview of the prominent land use types and their compatibility within JB MDL's safety zones surrounding the installation.

Approximately 1,498 acres of off-installation property is associated with the CZs and APZs for JB MDL – McGuire. Of this total, approximately 1,355 acres of property (over 90 percent) is considered compatible, including the portion considered conditionally compatible (compatible with restrictions) with aircraft operations.

JB MDL – Lakehurst has slightly more total acreage associated with CZs and APZs extending off installation property due to the runway's closer proximity to the installation boundary, as well as the addition of APZs associated with Test Strip 12/30. A total of 3,643 acres is associated with CZs and APZs on non-installation property, of which a total of 3,383 acres (or approximately 93 percent) is considered compatible, including the portion considered conditionally compatible (compatible with restrictions) with aircraft operations.

A list of off-installation land use acreages within the noise zones by land use category is found in Table 6-4. A discussion of general land uses within the JB MDL CZs and APZs associated with both JB MDL – McGuire and JB MDL – Lakehurst, and corresponding numbered inset maps for each, is provided in Section 6.4.3.





EXISTING LAND USE COMPATIBILITY

Compatible
All land uses are compatible without restrictions.

Compatible with Restrictions
Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the APZs and would require density limitations for land in APZs in order to be deemed compatible.

Incompatible with Exceptions
Certain land uses are conditionally incompatible and may require incorporation of noise-attenuation measures into the design and construction of structures and further evaluation to be considered compatible.

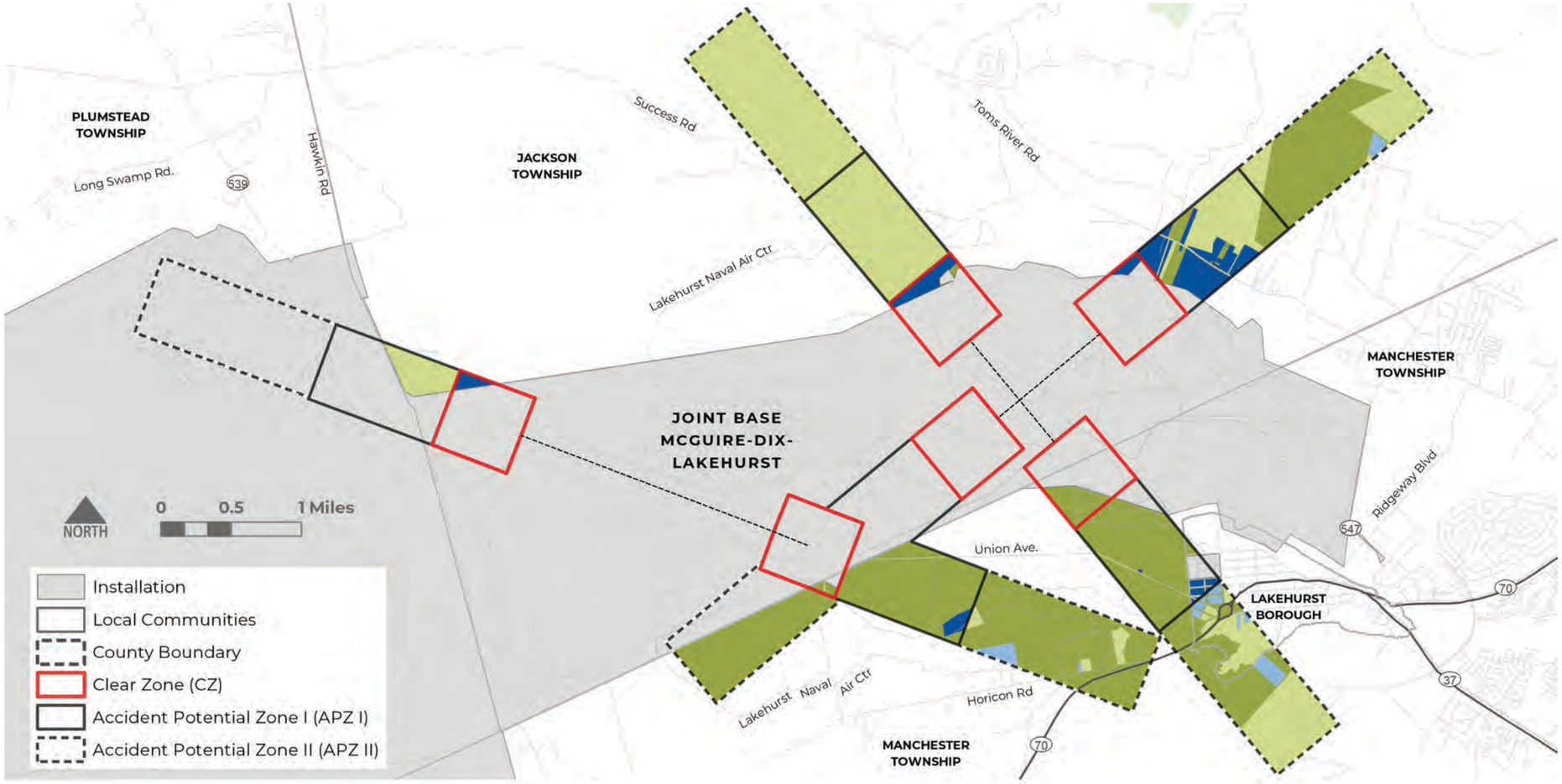
Incompatible
All land uses are incompatible without exceptions.

Figure 6-9 Incompatible Existing Land Uses within CZs and APZs for JB MDL – McGuire

Table 6-7 Off-Installation Existing Land Use Acreage within AICUZ Clear Zones and APZs for JB MDL Airfields

Designation	Generalized Land Use Category[3]	CZ	APZ I	APZ II	Total
JB MDL – McGuire					
Incompatible or Incompatible with Exceptions	Residential	—	21.46	119.81	**141.27**
	Commercial	—	—	—	**—**
	Industrial	—	—	—	**—**
	Public/Quasi-Public	—	1.90	—	**1.90**
	Transportation/Utility	—	—	—	**—**
	Open/Agriculture/Low Density	—	—	—	**—**
	Undeveloped	—	—	—	**—**
Compatible or Compatible with Restrictions	Residential	—	—	—	**—**
	Commercial	—	112.19	72.71	**184.90**
	Industrial	—	1.31	4.43	**5.74**
	Public/Quasi-Public	—		26.29	**26.29**
	Transportation/Utility	—	10.96	35.40	**46.36**
	Open/Agriculture/Low Density	—	196.29	824.50	**1,020.79**
	Undeveloped	—	5.73	65.32	**71.05**
Sub Total	**Incompatible**	**—**	**23.36**	**119.81**	**143.17**
	Compatible	**—**	**326.48**	**1,028.65**	**1,355.13**
JB MDL – Lakehurst					
Incompatible or Incompatible with Exceptions	Residential	—	80.07	60.24	**140.31**
	Commercial	—	—	—	**—**
	Industrial	—	—	—	**—**
	Public/Quasi-Public	10.13	62.49	—	**72.62**
	Transportation/Utility		—	—	**—**
	Open/Agriculture/Low Density	46.73	—	—	**46.73**
	Undeveloped	—	—	—	**—**
Compatible or Compatible with Restrictions	Residential	—	—	—	**—**
	Commercial	—	33.70	86.52	**120.22**
	Industrial	—	102.89	197.98	**300.87**
	Public/Quasi-Public	—	—	129.33	**129.33**
	Transportation/Utility	0.69	20.61	69.01	**90.31**
	Open/Agriculture/Low Density	—	419.42	486.02	**905.44**
	Undeveloped	62.32	633.07	1,141.69	**1,837.08**
Sub Total	**Incompatible**	**56.86**	**142.56**	**60.24**	**259.66**
	Compatible	**63.01**	**1,209.69**	**2,110.55**	**3,383.25**
JB MDL Total					
	Incompatible	**56.86**	**165.92**	**180.05**	**402.83**
	Compatible	**63.01**	**1,536.17**	**3,139.20**	**4,738.38**
Total		**119.87**	**1,702.09**	**3,319.25**	**5,141.21**

Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details.



EXISTING LAND USE COMPATIBILITY

Compatible

All land uses are compatible without restrictions.

Compatible with Restrictions

Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the APZs and would require density limitations for land in APZs in order to be deemed compatible.

Incompatible with Exceptions

Certain land uses are conditionally incompatible and may require incorporation of noise-attenuation measures into the design and construction of structures and further evaluation to be considered compatible.

Incompatible

All land uses are incompatible without exceptions.

Figure 6-10 Incompatible Existing Land Uses within CZs and APZs for JB MDL – Lakehurst

6.4.2 Future Land Use Compatibility Concerns

As noted in Section 6.4.1, JB MDL's 2022 AICUZ footprint overlays areas off the installation that may pose a compatibility concern with certain types of land uses, including also future land uses that have been identified. While the vast majority of impact areas are on military land or over undeveloped/forested areas, some areas of the local community are located within these noise contours and/or APZs.

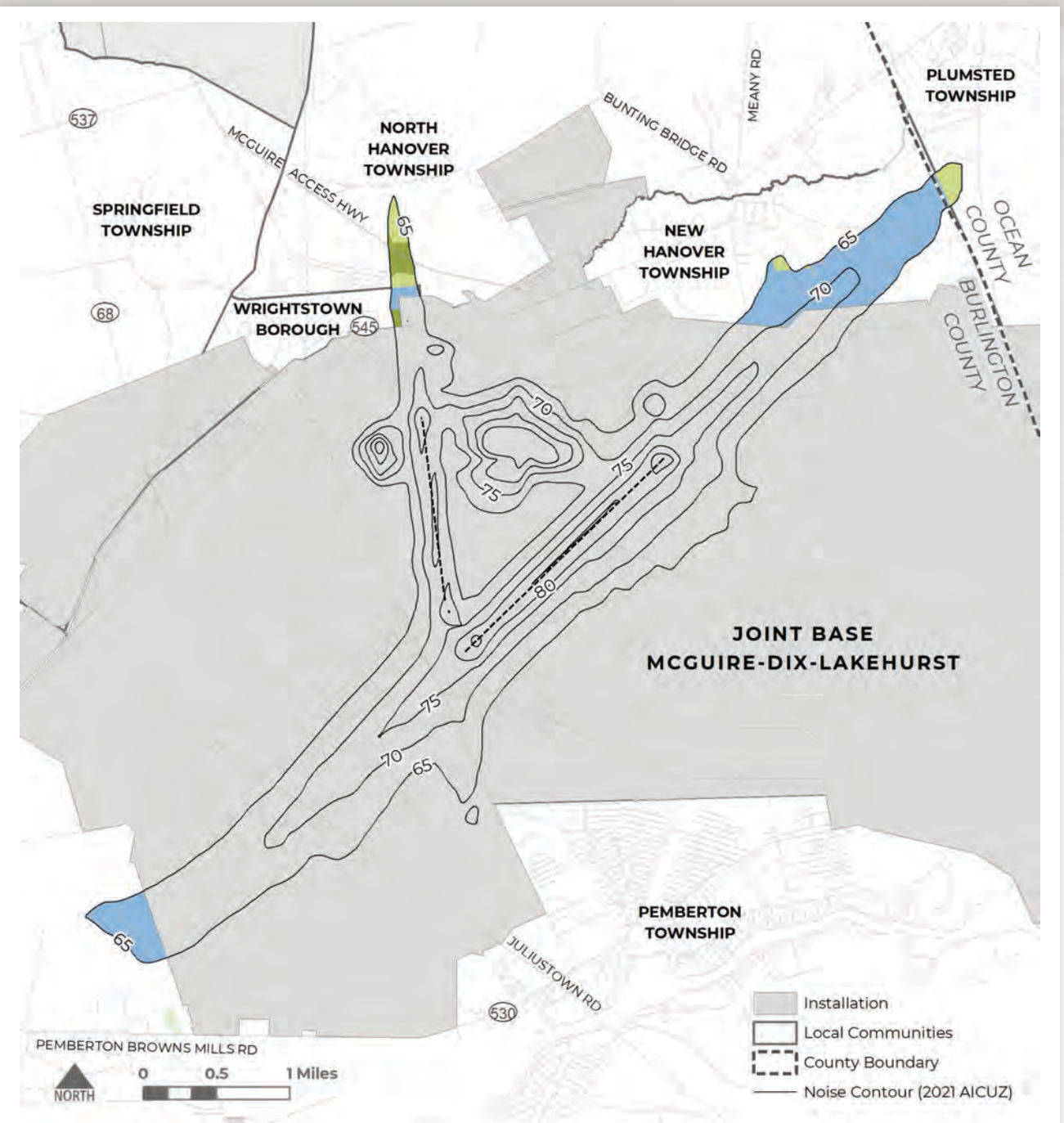
For analysis purposes, the future land use compatibility analysis is divided into two main discussions, with subcategories for noise:

1. **Compatibility Concerns within Noise Contours**
   - **Airfield noise contours** associated with JB MDL – McGuire and JB MDL – Lakehurst
   - **Range noise contours** associate **small-arms training**
   - **Range noise contours** associated with **large-caliber/explosive weapons**
2. **Compatibility Concerns within the APZs associated with JB MDL – McGuire and JB MDL – Lakehurst**

6.4.2.1 Compatibility Concerns within Noise Contours

6.4.2.1.1 JB MDL Noise Contours (DNL)

Figures 6-11 and 6-12 illustrate the compatibility of future land uses within the noise contours associated with, respectively, JB MDL – McGuire and JB MDL – Lakehurst.



FUTURE LAND USE COMPATIBILITY

Compatible
All land uses are compatible without restrictions.

Compatible with Restrictions
Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the noise contours and would require the incorporation of noise attenuation measures into the design and construction of structures in order to be deemed compatible.

Incompatible with Exceptions
Residential uses in noise zones are considered incompatible; however, if residential uses are considered essential, noise attenuation measures should be incorporated into building structures.

Figure 6-11 Incompatible Future Land Uses within Noise Contours for JB MDL – McGuire

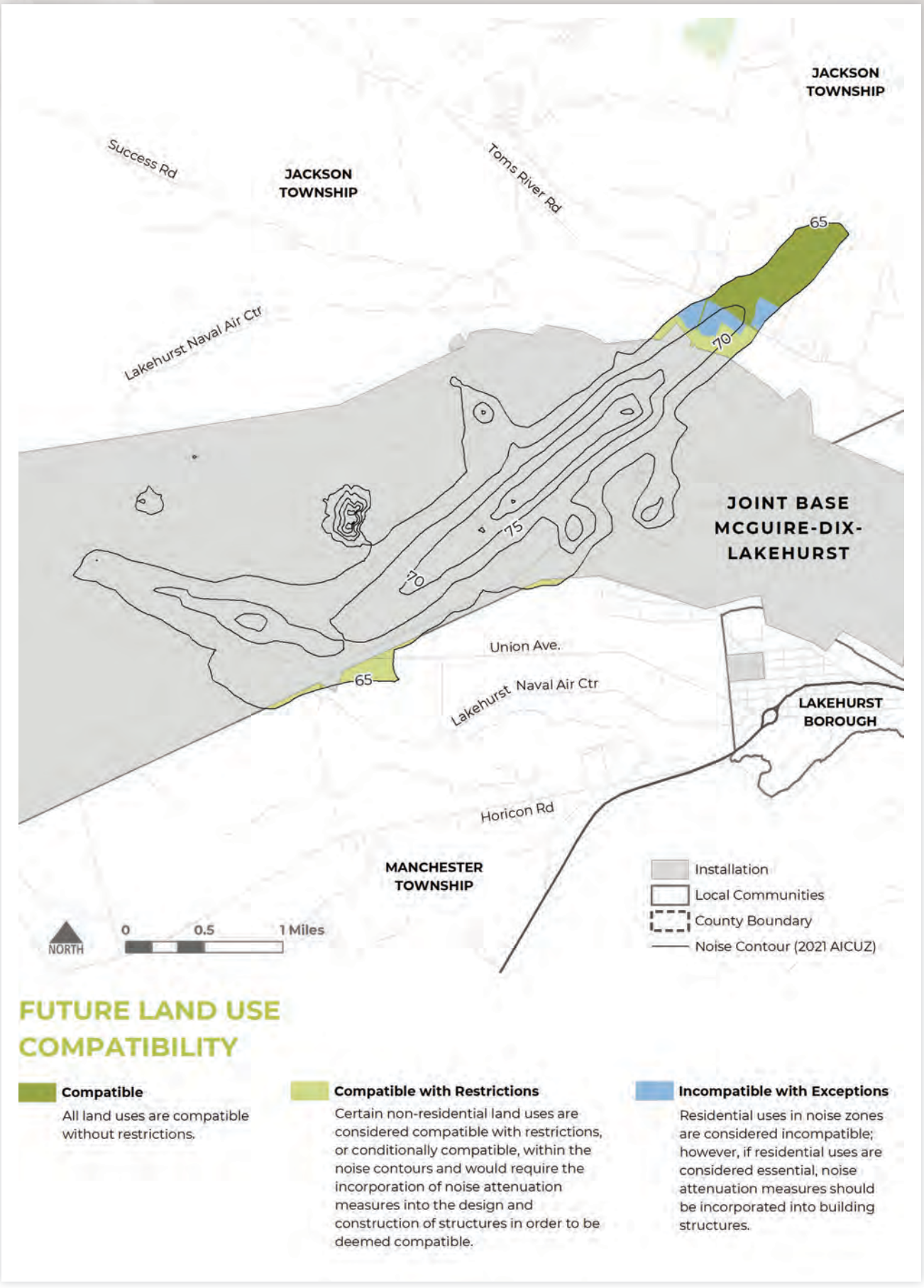


Figure 6-12 Incompatible Future Land Uses within Noise Contours for JB MDL – Lakehurst

The following presents an overview of the prominent future land use types and their compatibility within JB MDL's noise zones surrounding the installation.

Since the same noise contours are being used for the land use compatibility analysis between **Section 6.4.2** (existing land uses) and **6.4.3** (future land uses), the same 531 acres of off-installation property is associated with the greater than 65 dB DNL noise contours for JB MDL – McGuire. However, when evaluating future land uses, of this total, approximately 449 acres (or about 85 percent) is considered either incompatible or including incompatible with exceptions with respect to aircraft operations. This change in the compatibility mix is primarily due to areas where the existing land uses is "open/agriculture/low-density" but under future land uses they are considered residential, which is considered incompatible.

The greater than 65 dB DNL noise contours associated with JB MDL – Lakehurst extend over the same 285 acres of off-installation property as evaluated under the existing land use evaluation. Similarly, the majority of the land within the noise contours (approximately 237 acres, or 83 percent) is considered compatible, including those considered conditionally compatible (compatible with restrictions) with aircraft operations.

A list of off-installation future land use acreages within the noise zones by land use category is found in **Table 6-8.** A more detailed discussion of general land uses within the JB MDL noise zones associated with both JB MDL – McGuire and JB MDL – Lakehurst is provided in **Section 6.4.3,** with specific focus on areas of development in the noise contours.

6.4.2.1.2 JB MDL – Dix Noise Contours (Small Arms [PK15])

Figure 6-13 presents the compatibility of future land use for the peak-noise contours associated with small-arms training at JB MDL – Dix. The noise contours associated with small-arms training extend off installation to property to the north and south. The following is an overview of the prominent land use types and their compatibility within these noise contours.

As noted previously, the same noise contours are being used for the land use compatibility analysis between **Section 6.4.2** (existing land uses) and 6.4.3 (future land uses), and therefore, the same 4,717 acres of off-installation property is within the 87 dB PK15 noise contour. Areas outside of the 87 dB PK15 noise contour are referred to as "Noise Zone I" and are considered compatible and serve as a buffer. The greater than 104 dB PK15 noise contour covers approximately 193 acres. Overall, as shown in **Table 6-9,** approximately 3,002 acres (or 64 percent) of the land uses within these noise contours are considered compatible, including conditionally compatible (compatible with restrictions) with small-arms range operations. This is less than is considered compatible under the existing land use evaluation; however, is primarily attributed to areas that are currently considered "open/agriculture/low-density" but in the future land use data set are considered residential. The 1,716 acres that are considered incompatible are either residential land uses to the north of the range or residential areas to the south in Browns Mills and around Mirror Lake.

Table 6-8 Off-Installation Future Land Use Acreage within AICUZ Noise Zones

Designation	Generalized Land Use Category[1]	60-64	65-69	70-74	75-79	80+	Total
JB MDL – McGuire							
Incompatible or Incompatible with Exceptions	Residential	414.3	34.2	—	—	—	**448.6**
	Commercial	—	—	—	—	—	—
	Industrial	—	—	—	—	—	—
	Public/Quasi-Public	—	—	—	—	—	—
	Transportation/Utility	—	—	—	—	—	—
	Open/Agriculture/Low Density	—	—	—	—	—	—
	Undeveloped	—	—	—	—	—	—
Compatible or Compatible with Restrictions	Residential	—	—	—	—	—	—
	Commercial	22.6	—	—	—	—	**22.6**
	Industrial	—	—	—	—	—	-
	Public/Quasi-Public	7.1	1.1	—	—	—	**8.2**
	Transportation/Utility	2.6	—	—	—	—	**2.6**
	Open/Agriculture/Low Density	47.5	—	—	—	—	**47.5**
	Undeveloped	1.4	—	—	—	—	**1.4**
Sub Total	**Incompatible**	**414.3**	**34.2**	**—**	**—**	**—**	**448.6**
	Compatible	**81.2**	**1.1**	**—**	**—**	**—**	**82.3**
JB MDL – Lakehurst							
Incompatible or Incompatible with Exceptions	Residential	30.6	17.1	—	—	—	**47.7**
	Commercial	—	—	—	—	—	—
	Industrial	—	—	—	—	—	—
	Public/Quasi-Public	—	—	—	—	—	—
	Transportation/Utility	—	—	—	—	—	—
	Open/Agriculture/Low Density	—	—	—	—	—	—
	Undeveloped	—	—	—	—	—	—
Compatible or Compatible with Restrictions	Residential	—	—	—	—	—	—
	Commercial	—	—	—	—	—	—
	Industrial	140.3	3.6	—	—	—	**143.9**
	Public/Quasi-Public	0.1	0.2	—	—	—	**0.3**
	Transportation/Utility	3.8	1.4	—	—	—	**5.2**
	Open/Agriculture/Low Density	69.6	17.7	—	—	—	**87.3**
	Undeveloped			—	—	—	—
Sub Total	**Incompatible**	**30.6**	**17.1**	**—**	**—**	**—**	**47.7**
	Compatible	**213.8**	**22.9**	**—**	**—**	**—**	**236.7**
JB MDL Total							
	Incompatible	**43.98**	**19.09**	**—**	**—**	**—**	**63.07**
	Compatible	**696.00**	**56.24**	**—**	**—**	**—**	**752.24**
Total		**739.98**	**75.33**	**0**	**0**	**0**	**815.31**

Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details.

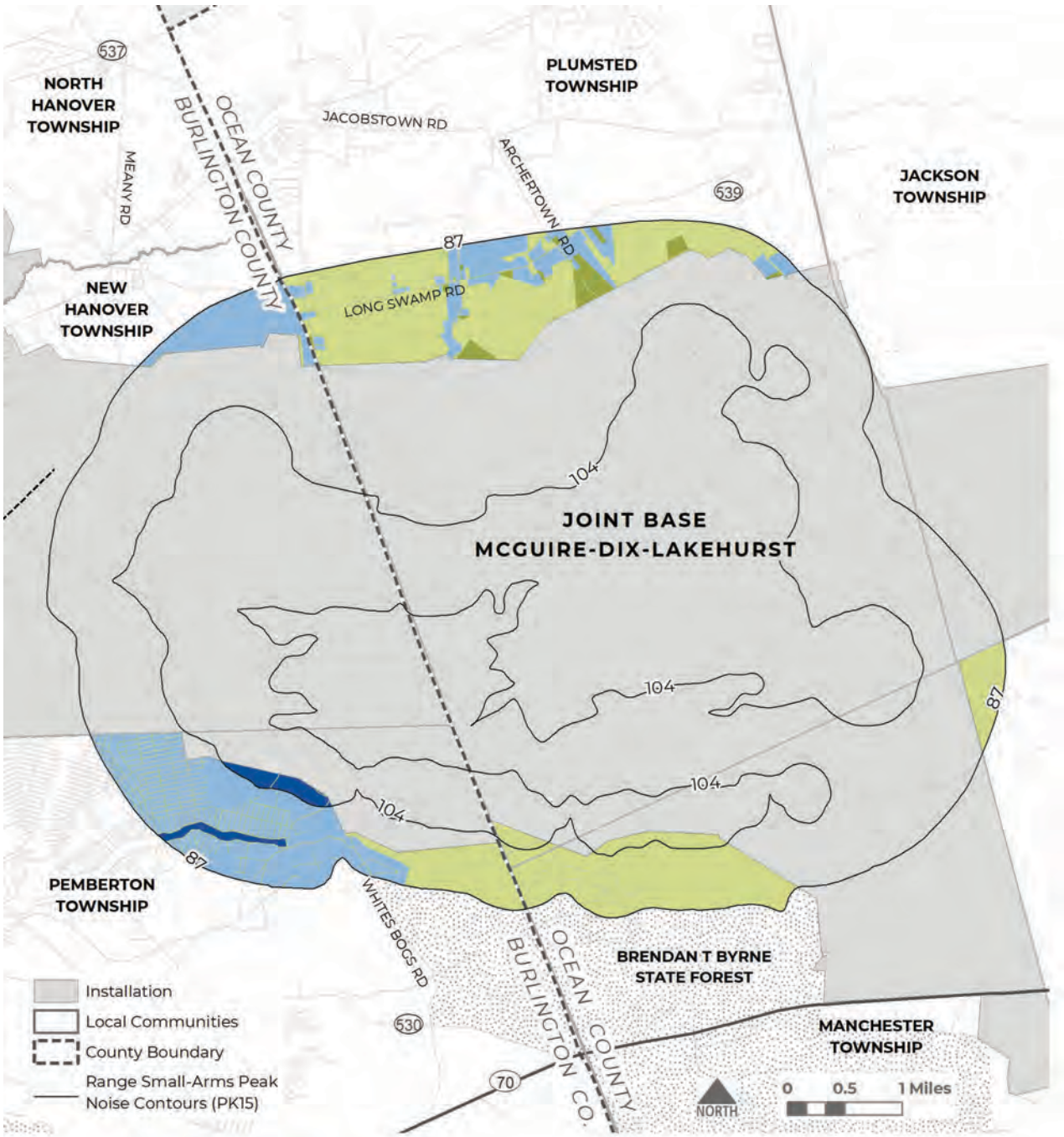
It should be noted that the Brendan T. Byrne State Forest is located to the south of the JB MDL – Range and spans two counties and townships. The land use data presented in Figure 6-4 shows that the two municipalities categorize this area differently; however, for the purposes of this analysis and to maintain consistency for the compatibility analysis, this area was considered open/agriculture/low-density and therefore conditionally compatible with the noise contours in which it is present. A state forest area is the type of buffer around an installation that is desirable and helps address potential encroachment concerns.

A list of off-installation land use acreages within the noise zones by land use category are found in Table 6-9. A more detailed discussion of general land uses within the JB MDL – Dix noise zones is provided in Section 6.4.3, with specific focus on areas of development in the noise zones to the north and south of the range area.

Table 6-9 Off-Installation Future Land Use Acreage within Live Small-Arms Peak Noise Contours (PK15)

		Noise Zones			
Designation	Generalized Land Use Category[1]	LUPZ (<87 dB PK15)[2]	Noise Zone II (87-104 dB PK15)	Noise Zone III (>104 dB PK15)	Total
JB MDL – Dix					
Incompatible or Incompatible with Exceptions	Residential	—	1,642.8	72.9	**1,715.7**
	Commercial	—	—	—	**—**
	Industrial	—	—	—	**—**
	Public/Quasi-Public	—	—	—	**—**
	Transportation/Utility	—	—	—	**—**
	Open/Agriculture/Low Density	—	—	—	**—**
	Undeveloped	—	—	—	**—**
Compatible or Compatible with Restrictions	Residential	—	—	—	**—**
	Commercial	—	88.7	—	**88.7**
	Industrial	—	—	—	**—**
	Public/Quasi-Public	—	282.5	—	**282.5**
	Transportation/Utility	—	177.8	2.4	**180.2**
	Open/Agriculture/Low Density	—	2,221.5	117.7	**2,339.2**
	Undeveloped	—	111.4	—	**111.4**
Sub Total	**Incompatible**	**—**	**1,642.8**	**72.9**	**1,715.7**
	Compatible	**—**	**2,881.9**	**120.1**	**3,002.0**
Total		**—**	**4,524.7**	**193.0**	**4,717.7**

Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details. [2] Acreages in Noise Zone I are not quantified because this area entails anything outside of the 87 dB PK15 contour. In addition, all areas in Noise Zone I are considered compatible.



FUTURE LAND USE COMPATIBILITY

Compatible
All land uses are compatible without restrictions.

Compatible with Restrictions
Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the noise contours and would require the incorporation of noise attenuation measures into the design and construction of structures in order to be deemed compatible.

Incompatible with Exceptions
Residential uses in noise zones are considered incompatible; however, if residential uses are considered essential, noise attenuation measures should be incorporated into building structures.

Incompatible
All land uses are incompatible without exceptions.

Figure 6-13 Incompatible Future Land Use within Small-Arms (PK15) Noise Contours for JB MDL – Range

6.4.2.1.3 JB MDL – Dix Noise Contours (Large-caliber Weapons and Explosives [CDNL])

Figure 6-14 illustrates the compatibility of future land uses for the C-weighted day-night average sound level (CDNL) noise contours associated with large-caliber weapons and explosives training at JB MDL – Dix. The noise contours associated with large-caliber weapons and explosives training extend off installation property to the north and south. The following presents an overview of the prominent land use types and their compatibility within these noise contours.

The same 308 acres of off-installation property within the 57 dB CDNL noise contour was evaluated for future land use as was evaluated in Section 6.4.2 for existing land uses. However, when looking at future land uses, all areas were considered compatible within both the 62-70 dB CDNL noise contour as well as the greater than 70 dB CDNL contour that falls outside of the installation boundary.

A list of off-installation land use acreages within the noise zones by land use category is found in Table 6-10. A more detailed discussion of general land uses within the JB MDL – Dix noise zones and inset maps is provided in Section 6.4.3.

Table 6-10 Off-Installation Future Land Use Acreage within Large-Caliber Weapons and Explosives Noise Contours (CDNL)

		Noise Zones			
Designation	Generalized Land Use Category[1]	LUPZ 57-62 (CDNL)	Noise Zone II 62-70 (CDNL)	Noise Zone III >70 (CDNL)	Total
JB MDL – Dix					
Incompatible or Incompatible with Exceptions	Residential	—	—	—	—
	Commercial	—	—	—	—
	Industrial	—	—	—	—
	Public/Quasi-Public	—	—	—	—
	Transportation/Utility	—	—	—	—
	Open/Agriculture/Low Density	—	—	—	—
	Undeveloped	—	—	—	—
Compatible or Compatible with Restrictions	Residential	—	—	—	—
	Commercial	—	—	—	—
	Industrial	—	—	—	—
	Public/Quasi-Public	—	—	—	—
	Transportation/Utility	4.6	—	—	**4.6**
	Open/Agriculture/Low Density	289.7	13.4	—	**303.1**
	Undeveloped	—	—	—	—
Sub Total	**Incompatible**	**—**	**—**	**—**	**—**
	Compatible	**294.3**	**13.4**	**—**	**307.7**
Total		**294.3**	**13.4**	**0**	**307.7**

Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details.

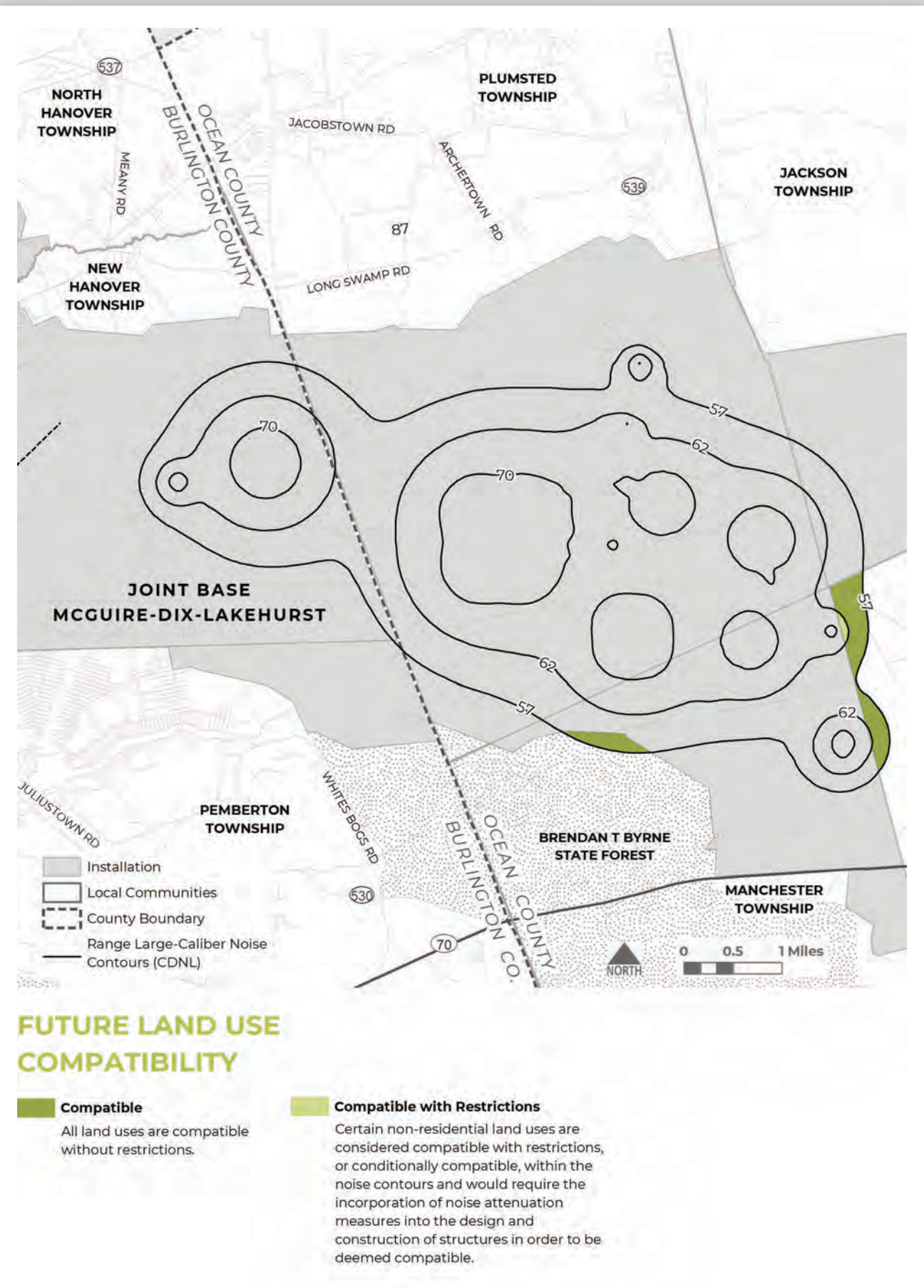


Figure 6-14 **Incompatible Future Land Uses within Large-Caliber Weapons and Explosives (CDNL) Noise Contours for JB MDL – Dix**

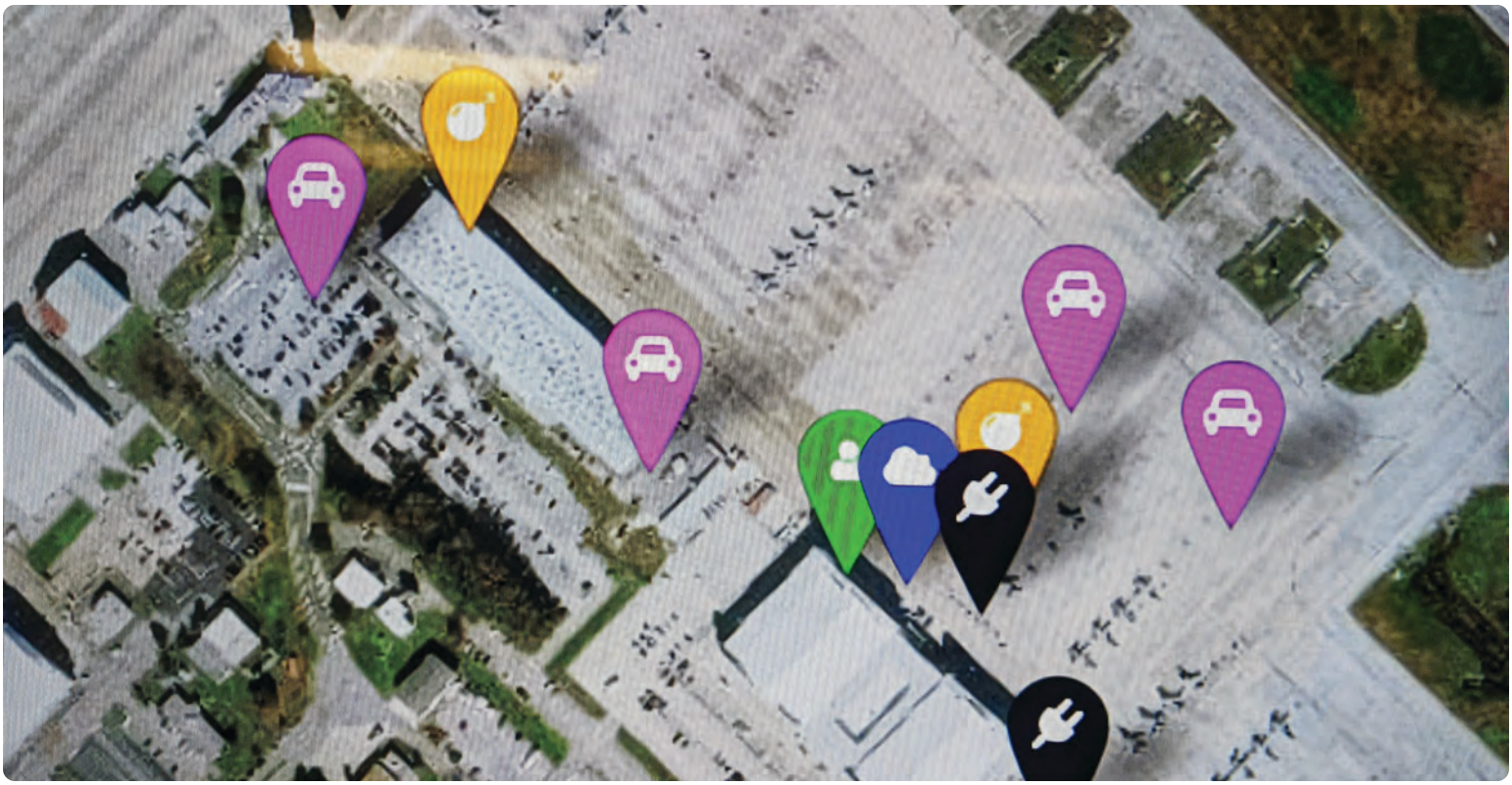
6.4.2.2 Compatibility Concerns within APZs

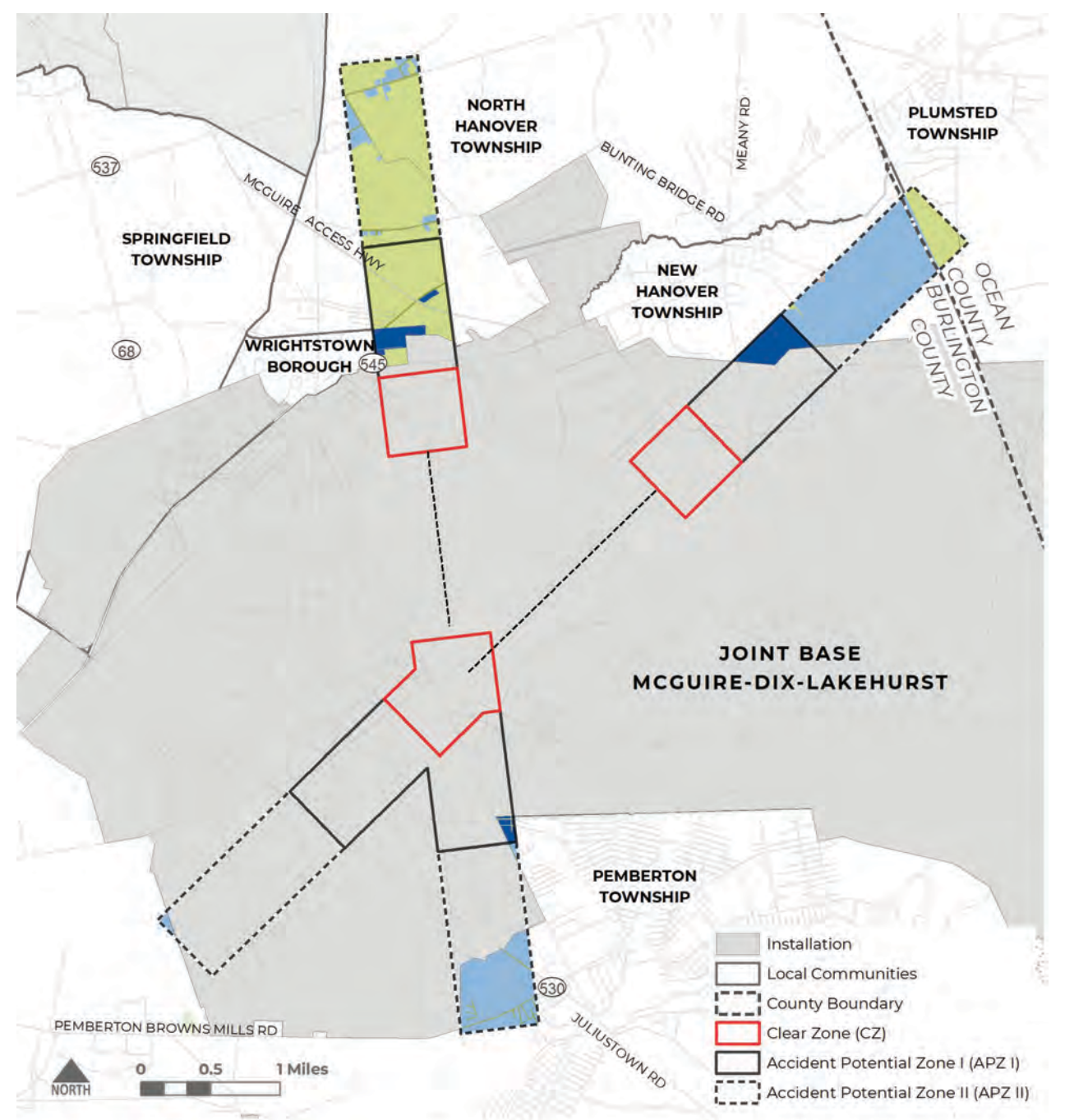
Figures 6-15 and 6-16 illustrate the compatibility of future land uses within the CZs and APZs associated with, respectively, JB MDL – McGuire and JB MDL – Lakehurst. The following is an overview of the prominent future land use types and their compatibility within JB MDL's safety zones surrounding the installation.

Approximately 1,498 acres of off-installation property is associated with the CZs and APZs for JB MDL – McGuire. Of this total, using future land use data, approximately 759 acres of property (about 51 percent) is considered compatible, including the portion considered conditionally compatible (compatible with restrictions) with aircraft operations. This is less than under the existing land use analysis for the reasons identified previously – primarily lands that were categorized as open/agriculture/low-density are categorized as residential in the future land use data.

As noted previously, JB MDL – Lakehurst has slightly more total acreage associated with CZs and APZs extending off installation property due to the runway's closer proximity to the installation boundary, as well as the addition of APZs associated with Test Strip 12/30. A total of 3,643 acres is associated with CZs and APZs on non-installation property, of which a total of 3,238 acres (or approximately 89 percent) is considered compatible, including the portion considered conditionally compatible (compatible with restrictions) with aircraft operations. This proportion of compatible lands is slightly less, but close to that under the existing land use evaluation.

A list of off-installation future land use acreages within the noise zones by land use category is found in Table 6-11. A discussion of general land uses within the JB MDL CZs and APZs associated with both JB MDL – McGuire and JB MDL – Lakehurst, and corresponding numbered inset maps for each, is provided in Section 6.4.3.





FUTURE LAND USE COMPATIBILITY

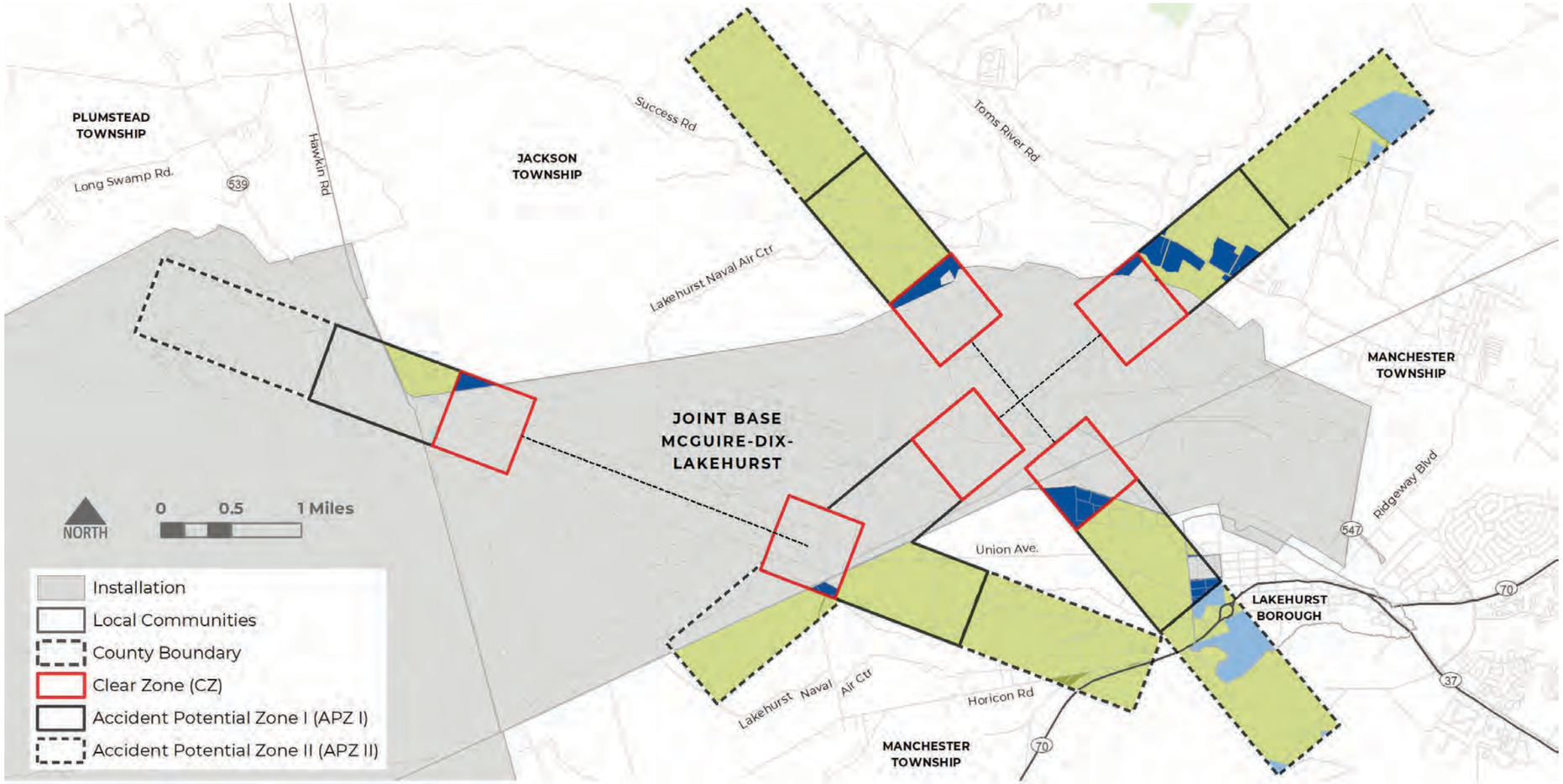
Compatible
All land uses are compatible without restrictions.

Compatible with Restrictions
Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the APZs and would require density limitations for land in APZs in order to be deemed compatible.

Incompatible with Exceptions
Certain land uses are conditionally incompatible and may require incorporation of noise-attenuation measures into the design and construction of structures and further evaluation to be considered compatible.

Incompatible
All land uses are incompatible without exceptions.

Figure 6-15 Incompatible Future Land Uses within CZs and APZs for JB MDL – McGuire



FUTURE LAND USE COMPATIBILITY

Compatible

All land uses are compatible without restrictions.

Compatible with Restrictions

Certain non-residential land uses are considered compatible with restrictions, or conditionally compatible, within the APZs and would require density limitations for land in APZs in order to be deemed compatible.

Incompatible with Exceptions

Certain land uses are conditionally incompatible and may require incorporation of noise-attenuation measures into the design and construction of structures and further evaluation to be considered compatible.

Incompatible

All land uses are incompatible without exceptions.

Figure 6-16 Incompatible Future Land Uses within CZs and APZs for JB MDL – Lakehurst

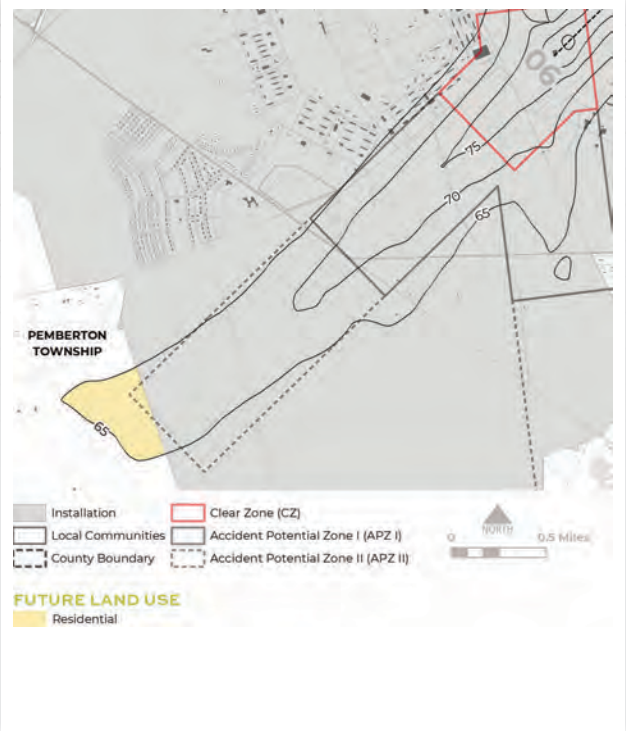
Table 6-11 Off-Installation Future Land Use Acreage within AICUZ Clear Zones and APZs for JB MDL Airfields

Designation	Generalized Land Use Category[3]	CZ	APZ I	APZ II	Total
JB MDL – McGuire					
Incompatible or Incompatible with Exceptions	Residential	—	102.6	635.1	**737.7**
	Commercial	—	—	—	**—**
	Industrial	—	—	—	**—**
	Public/Quasi-Public	—	2.1	—	**2.1**
	Transportation/Utility	—	—	—	**—**
	Open/Agriculture/Low Density	—	—	—	**—**
	Undeveloped	—	—	—	**—**
Compatible or Compatible with Restrictions	Residential	—	—	—	**—**
	Commercial	—	110.7	10.3	**121.0**
	Industrial	—	—	—	**—**
	Public/Quasi-Public	—	—	6.7	**6.7**
	Transportation/Utility	—	10.6	28.7	**39.3**
	Open/Agriculture/Low Density	—	119.3	467.2	**586.5**
	Undeveloped	—	4.6	0.5	**5.1**
Sub Total	**Incompatible**	**—**	**104.7**	**635.1**	**739.8**
	Compatible	**—**	**245.2**	**513.4**	**758.6**
JB MDL – Lakehurst					
Incompatible or Incompatible with Exceptions	Residential	—	91.1	194.0	**285.1**
	Commercial	—	—	—	**—**
	Industrial	—	—	—	**—**
	Public/Quasi-Public	0.1	0.2	—	**0.3**
	Transportation/Utility	0.5	—	—	**0.5**
	Open/Agriculture/Low Density	119.3	—	—	**119.3**
	Undeveloped	—	—	—	**—**
Compatible or Compatible with Restrictions	Residential	—	—	—	**—**
	Commercial	—	—	41.5	**41.5**
	Industrial	—	193.9	346.6	**540.5**
	Public/Quasi-Public	—	—	—	**—**
	Transportation/Utility	—	15.0	14.7	**29.7**
	Open/Agriculture/Low Density	—	1,052.0	1,573.9	**2,625.9**
	Undeveloped	—	—	—	**—**
Sub Total	**Incompatible**	**119.9**	**91.3**	**194.0**	**405.2**
	Compatible	**0**	**1,260.9**	**1,976.7**	**3,237.6**
JB MDL Total					
	Incompatible	**119.9**	**196.0**	**829.1**	**1,145.0**
	Compatible	**0**	**1,506.1**	**2,490.1**	**3,996.2**
Total		**119.0**	**1,702.1**	**3,319.2**	**5,141.2**

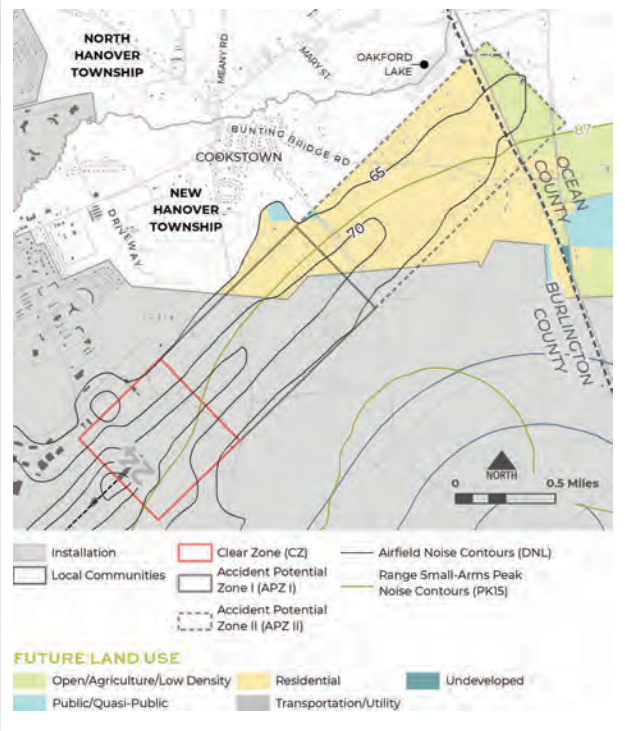
Notes: All noise contour areas on the installation are excluded from the counts. [1] Refer to Appendix A for details.

6.4.3 Compatibility Analysis and Future Land Uses within the AICUZ Footprint

This section shows areas of the AICUZ footprint where the noise contours or APZs extend off the installation property along with the future land uses in these areas to further address any compatibility concerns.



JB MDL – McGuire, Southwest



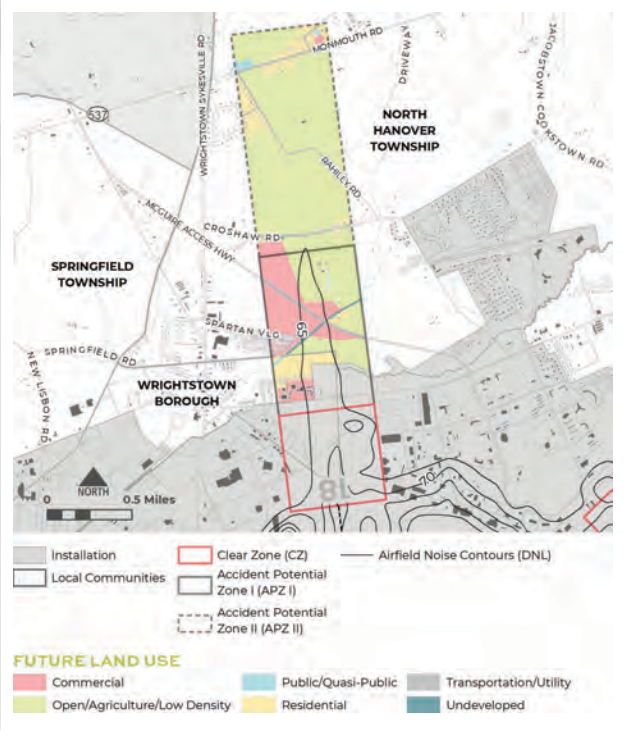
JB MDL – McGuire, Northeast

JB MDL – McGuire, Southwest

A small portion of the 65 dB DNL noise contour and APZ II extends southwest from the approach to Runway 06 into Pemberton Township. Although the existing land uses in this area are public/ quasi-public and open/ agriculture/ low density development, the future land uses allow for residential development. If residential development takes place in this area, it would be considered incompatible. This area is not currently a significant concern from a noise and safety perspective for aircraft operating at JB MDL – McGuire; however, it should be monitored and compatible development should be encouraged.

JB MDL – McGuire, Northeast

This inset shows both the noise contours and APZs to the northeast of Runway 24, as well as the PK15 small-arms noise contours associated with JB MDL – Dix. The area covered primarily consists of residential development in New Hanover Township and other open/agriculture/low-density areas and public/quasi-public lands. Residential development is considered incompatible or incompatible with exceptions within these noise zones and APZs. Care should be taken to encourage compatible development in this area north of the installation, specifically along these sections of Hockamick Road and Bunting Bridge Road, by either limiting further residential uses that may be considered incompatible or requiring proper sound attenuation be incorporated into building structures.



JB MDL – McGuire, North

JB MDL – McGuire, North

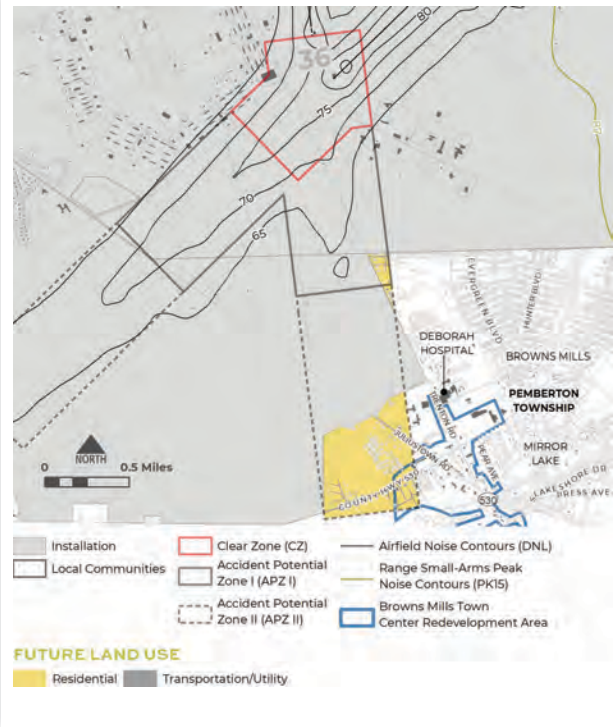
A small portion of the 65 dB DNL noise contour and larger portions of APZs I and II extend north along the approach to Runway 18 into Wrightstown Borough and North Hanover Township. The future land uses in this area are a mix of open/agriculture/low density development and commercial, with smaller amounts of residential and other developments. Most of the area is compatible or compatible with restrictions; however, the residential developments within APZs I and II are incompatible. The eastern portion of the Spartan Village housing area off of Sykesville Road is within APZ I and incompatible as it is used for residential purposes, but this land use is classified as a commercial entity as it is considered a business. Other development in this area includes a shopping center in APZ I that includes retail shops, a hotel, and other commercial entities along East Main Street, as well as a large solar array development to the north in APZ II.

Further development of these areas should encourage compatible land uses and, if residential land uses are considered essential and without viable alternative sites, proper sound attenuation should be incorporated into the design and construction of new building structures; however, these units will remain incompatible. For residential growth deemed essential, a density limit of two dwellings per acre should be adhered to within APZ II (residential land uses within APZ I is incompatible).

JB MDL – McGuire, South

To the south of JB MDL – McGuire, APZs I and II extend off-installation property into Pemberton Township in the Browns Mills area (none of the greater than 65 dB DNL noise contours are off installation property in this area). This is an area around the perimeter of JB MDL that has seen fairly robust development, including commercial, residential, industrial, and mixed uses. The future land uses shown indicate primarily residential development within APZ I and II. Development in this area includes the school bus depot, residential development to the south of Juliustown Road, and additional retail/ residential development and a church along North Pemberton Road in APZ II.

Although this area is fairly built out, there are pockets of undeveloped parcels where compatible development should be encouraged. In addition, within and immediately adjacent to the eastern boundary of APZ II, there is a proposed redevelopment plan for the Browns Mills town center (presented with a blue outline).

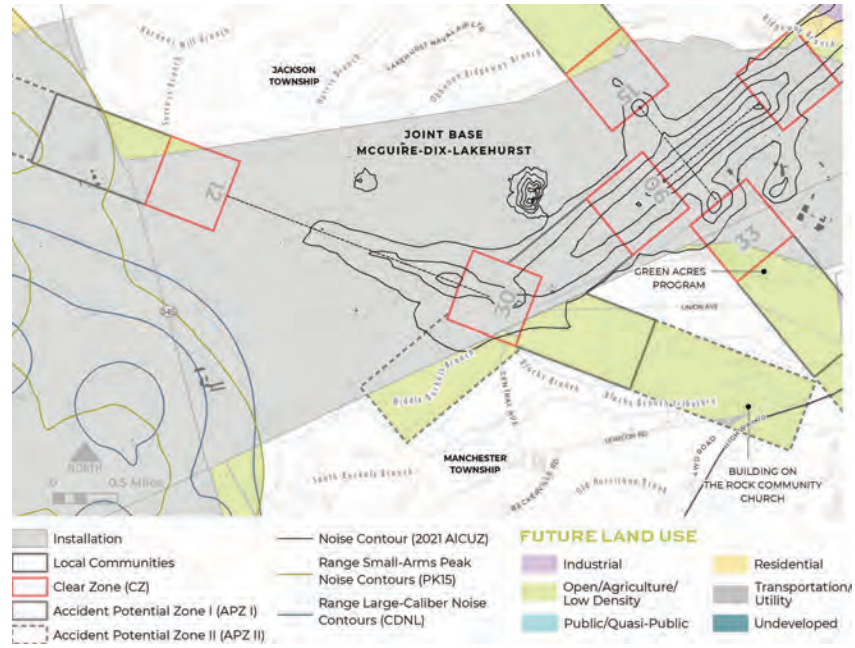


JB MDL – McGuire, South

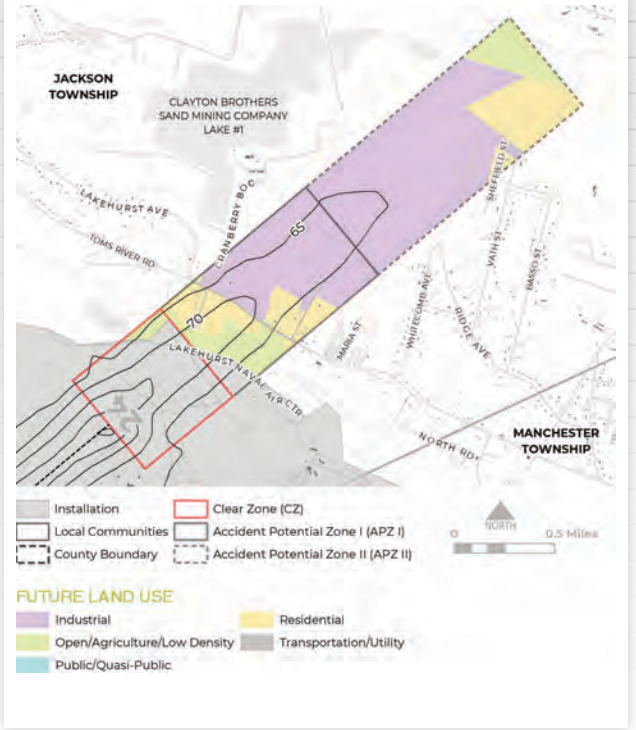
The JB MDL APZs are mentioned within this redevelopment plan, and it is recommended that AICUZ guidelines be considered as this project proceeds. In addition, there is a proposed HUD development to the north of Deborah Hospital, but is not located within the noise contours or APZs.

JB MDL – Lakehurst, Test Runway 12/30 and South

This image depicts the CZs and APZs associated with Test Strip 12/30 at JB MDL – Lakehurst, as well as the APZs extending to the southwest along the approach to Runway 06; they are shown together because there is overlap and/ or short distance between them. The majority of the lands covered are considered open/ agriculture/low density from a future land use perspective. The majority of CZs originating from these runways are contained on installation property; however, small corners of the two CZs for Test Strip 12/30 extend slightly off base. Although these areas are showing incompatible as they could be developed in the future, the are currently undeveloped and effort should be made to keep these areas clear of buildings and obstructions. The portions of APZs I and II to the southeast of Runway 06 cover open/agriculture/ low density and are considered primarily compatible or compatible with restrictions. There is a church located in APZ II along Beckerville Road, which when evaluated by the existing land use would be considered incompatible.



JB MDL – Lakehurst, Test Strip 12/30 and South



JB MDL – Lakehurst, Northeast

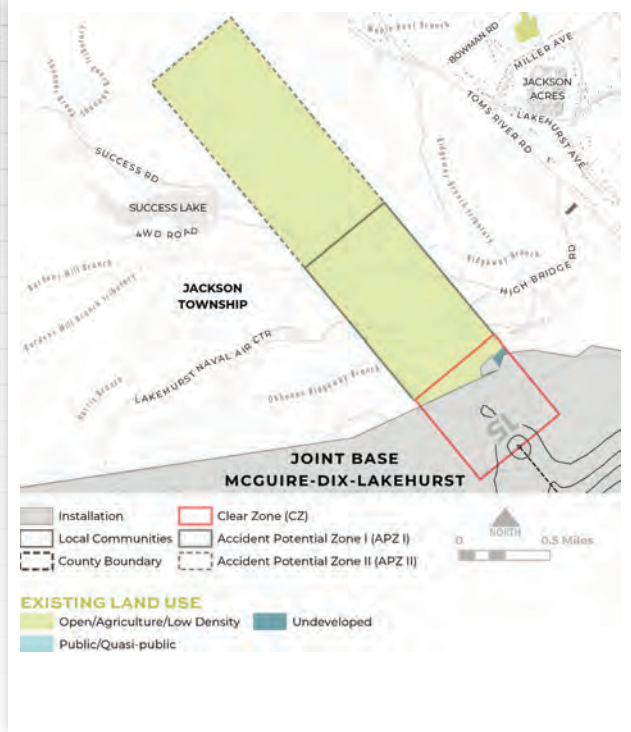
JB MDL – Lakehurst, Northeast

This inset shows both the noise contours and APZs to the northeast of Runway 24 that cover areas of Jackson Township. This is a moderately developed area with a mix of land use types, including residential, industrial, as well as public/quasi-public, open/agriculture/low density future land uses. Along Toms River Road, there is both residential and commercial development (a vehicle repair shop and quarry activities).

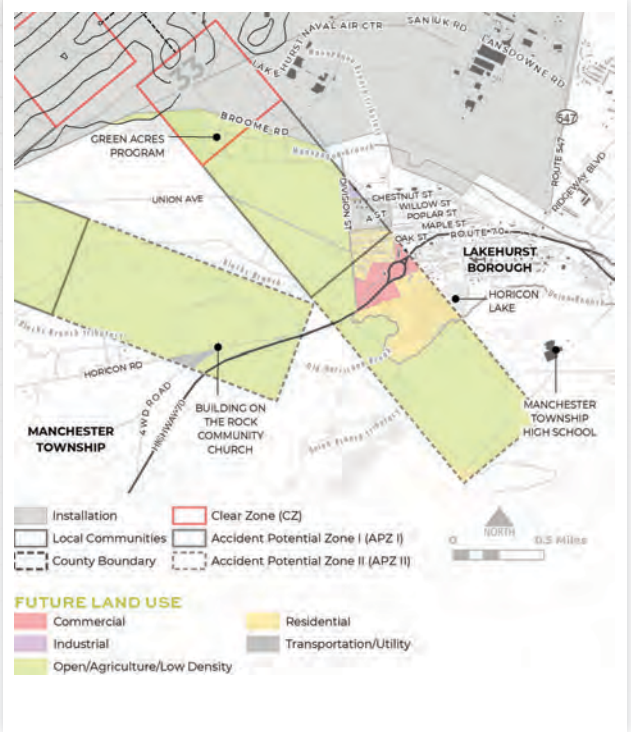
From a noise perspective, most of these areas are compatible or compatible with restrictions. Appropriate sound attenuation strategies should be incorporated into buildings within these areas. From a safety perspective, there is a small area within the CZ that should be clear of development, although it is considered open/agriculture/low density, it is currently undeveloped forest land. Other areas within APZ I are considered incompatible or compatible with restrictions, which may require density limitations. Overall, although this area is showing some compatibility concerns from a land use perspective, much of the area remains forested/open space or associated with the Jackson Quarry or the Pine Barrens Golf Club at the end of APZ II.

JB MLD – Lakehurst, Northwest

The area to the northwest of Runway 15 in Jackson Township is primarily over areas designated as open/agriculture/low density and therefore considered compatible with restrictions, such as adhering to certain density limits. However, a small portion of the CZ does extend to the north of the installation property. This area is considered incompatible, although currently it is forested and no built structures are present. The local municipalities and JB MDL should make efforts to keep this area free from development.



JB MLD – Lakehurst, Northwest

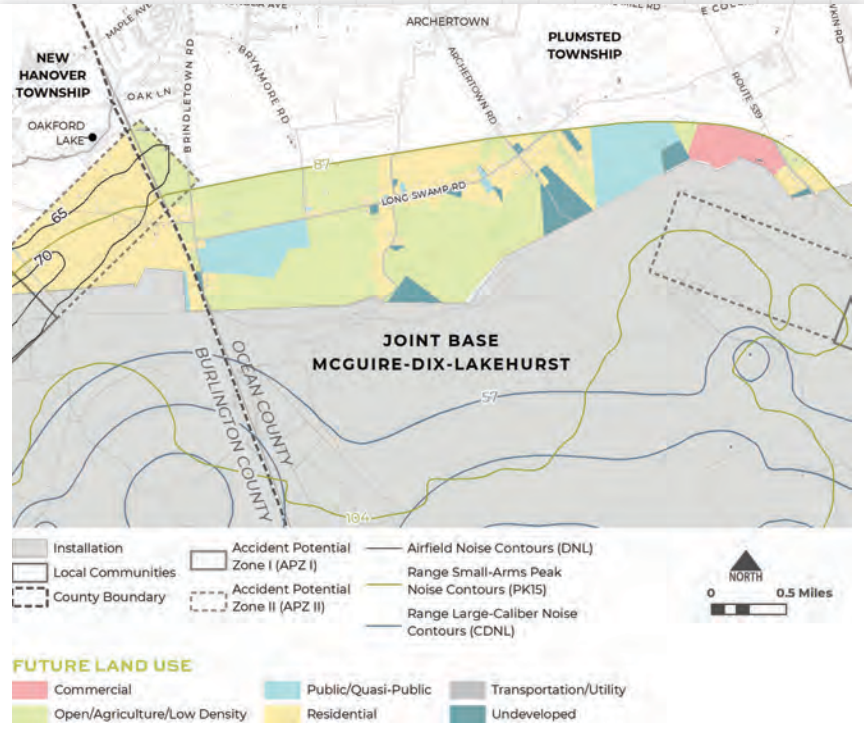


JB MDL – Lakehurst, Southeast

JB MDL – Lakehurst, Southeast

Although the noise contours do not extend to the southeast over Manchester Township and the Borough of Lakehurst, APZs I and II do cover moderately developed areas. Specifically, there are pockets of residential and commercial development, but the majority of the land uses are considered open/agriculture/low density. There is a large residential development along NJ State Route 70, which also includes several religious institutions, restaurants, and other retail businesses within both APZs I and II.

The undeveloped areas adjacent to the installation property in the CZ and part of APZ I are considered compatible, and development in this area should continue to be limited. Also located within this area are lands that are in the New Jersey Department of Environmental Protection's "Green Acres Program." Through this program, lands are purchased to protect environmentally sensitive open space, water resources, and other significant natural and historic open space. This program has the complementary benefit of limiting potentially incompatible development in this area outside of JB MDL. Further into APZ II, most of the land uses are considered compatible or compatible with restrictions; however, if residential uses are considered essential in this area, a density limitation of two dwellings per acre should be followed.



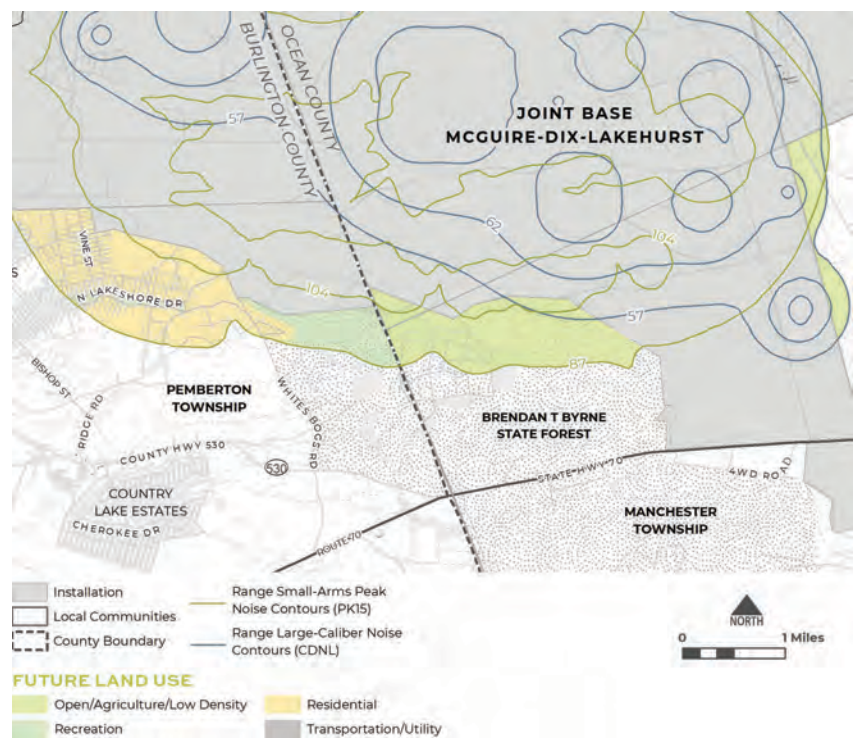
JB MDL – Dix, North

JB MDL – Dix, North

The noise contours associated with JB MDL – Dix operations—specifically, the PK15 noise contours from small-arms training—extend off installation property to the north into New Hanover Township and Plumsted Township. This is an area of limited development; however, it contains pockets of residential and commercial development, as well as public/quasi-public lands. Along Route 539 to the northeast of JB MDL – Dix is a topsoil, masonry, concrete, sand, and stone product quarry as well as an automobile recycling facility, with residential use to the south and mixed in amongst other development. Long Swamp Road has residential development along most of its span across the north of the installation but concentrated near the intersection of Archertown Road.

The majority of this area would be considered compatible or compatible with restrictions; however, the residential areas are incompatible with exceptions. If residential land uses are considered essential in this area, proper sound attenuation should be incorporated into the building structures. As further development is likely to occur, promote compatible growth in this area to avoid increasing incompatible development.

If residential land uses are considered essential in this area, proper sound attenuation should be incorporated into the building structures.



JB MDL – Dix, South

JB MDL – Dix, South

Similar to the previous inset, the PK15 noise contours associated with small-arms training and the CDNL noise contours associated with large-caliber training at JB MDL – Dix extend off installation property to the south into Pemberton Township and Manchester Township. The majority of the lands toward the east within these defined noise contours are considered residential, which are considered either incompatible or incompatible with exceptions for these noise contours. If residential land uses are essential within these noise zones, proper sound attenuation methods should be incorporated into building structures.

6.4.4 Recent and Proposed Development Projects around JB MDL

"White spaces" are areas that are close to an air station or range but fall outside the formally designated AICUZ footprint where AICUZ-focused land use planning recommendations are not formally applied (such as properties adjacent to the APZs or housing just outside the 65 dB DNL noise zone). These areas exist in all regions around bases where land development rules may vary, regulatory authority is broad, and long-term development strategies do not necessarily consider AICUZ concepts, but their potential impact on the installation's mission is real.

The primary focus of an *AICUZ Study* is land use within the safety and noise zones. This analysis is to promote the long-term sustainment of the military defense mission. Outside of the AICUZ footprint there are many developments or land uses that may impact the continued success of the military mission. Most reside within the Hazards to Aircraft Flight Zone (HAFZ), a recommended consultation zone. While the AICUZ Study does not analyze all potential projects, there are seven future projects—both in the white spaces and within the designated AICUZ footprint—that warrant attention from a land use compatibility standpoint are described below and are depicted on **Figure 6-17.**

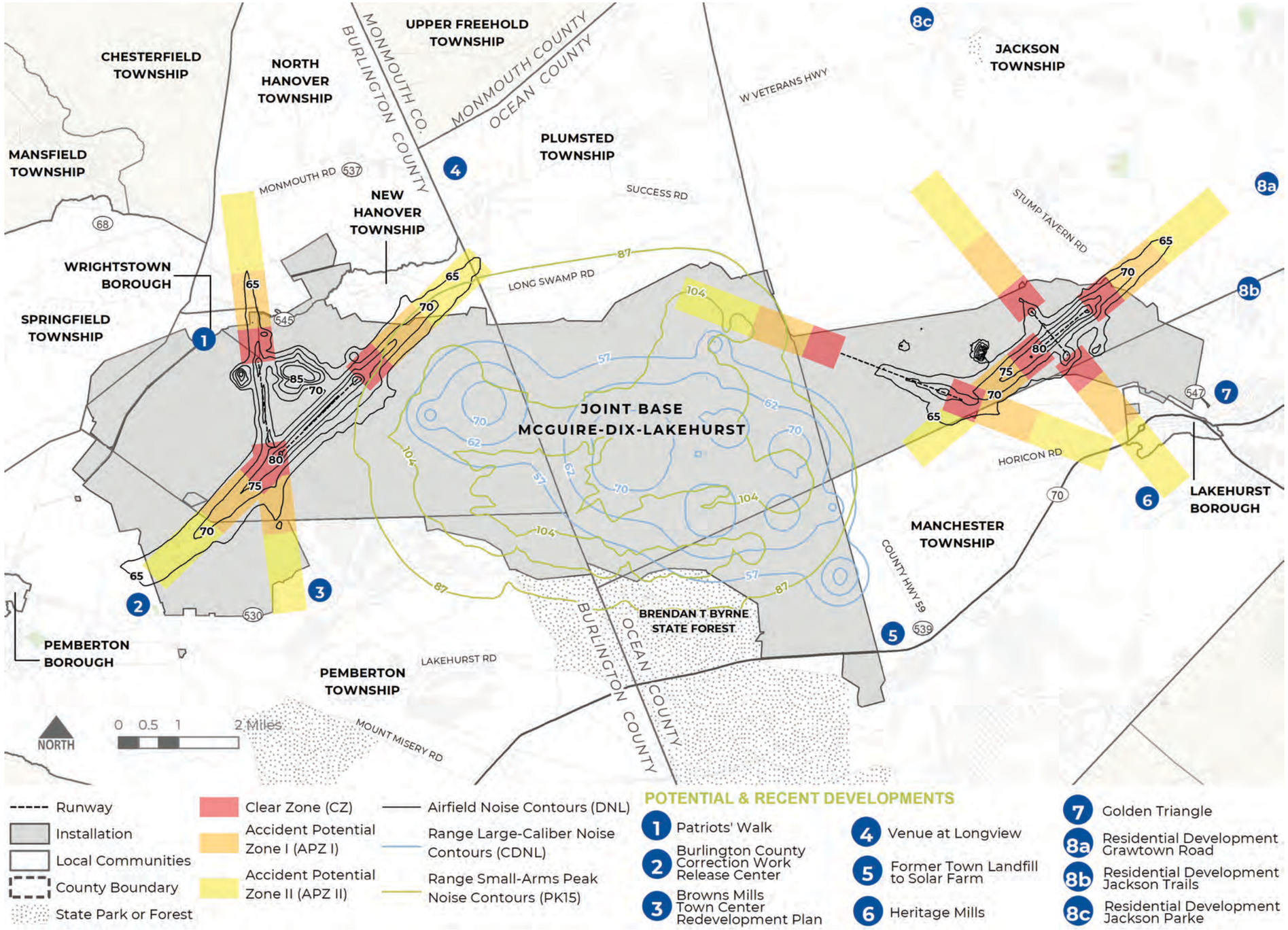


Figure 6-17 Recent and Proposed Development Projects around JB MDL

1 Patriots Walk, Wrightstown Borough

A development company is a prospective builder for a 56-acre parcel that was formerly a part of Fort Dix. Wrightstown Borough originally acquired about 40 acres from the federal government and then acquired an additional 10 acres for the proposed development called "Patriots Walk." The project includes development of a longtime vision to transform a wooded area on Saylors Pond Road into a mixed-use development with retail, residential housing, and a hotel with a parking garage. The proposed development site is generally bordered by Saylors Pond Road and Argonne Road and is west of JB MDL – McGuire's Runway 31. The site is not within either the designated APZs or the noise zones for JB MDL – McGuire. While this development is not considered incompatible, it should be noted that the proposed residential portion of the development will be in close proximity (approximately 1 mile) to the airfield's runways and therefore will experience some level of aircraft noise.

2 Former Burlington County Corrections Work Release Center, Pemberton Township

The former Burlington County Corrections and Work Release Center was demolished several years ago, and the now-vacant parcel is owned by the township. There have been different plans discussed for the site over the years; however, no specific projects are identified at this time.

3 Browns Mills Town Center Redevelopment Plan, Pemberton Township

The Browns Mills Township Redevelopment Area is located near the center of the Town of Browns Mills, along the east side Juliustown Road from Bank Street to Busansky Lane, south of JB MDL. This targeted site would ultimately be redeveloped from a former shopping center property into a pedestrian-friendly town center with retail stores centered around an open green space. The town is acquiring property in this area and preparing the site for redevelopment. The proposed project is located east of APZ II for JB MDL – McGuire's Runway 06, and, although this proposed use would potentially have people-intensive uses, it is outside of the installation's designated noise and safety zones and is therefore considered compatible with aircraft operations. If feasible, constructing the parking area(s) nearest to the safety zones is ideal.

4 Venue at Longview, Plumsted Township

In western Plumsted Township, to the northwest of New Egypt and along Province Line Road, there is a proposed residential subdivision referred to as "Venue at Longview," which is an active adult living development. Although this development is not within either the noise contours or APZs associated with JB MDL, it could experience some overflights of military aircraft operating out of JB MDL – McGuire. To the extent possible, homebuyers should be made aware of the proximity of the development to JB MDL and the potential to experience periodic aircraft operations.

5 Conversion of Former Town Landfill to Solar Farm, Manchester Township

The Manchester town landfill operated from 1958 to 1985. The landfill site is located in Whiting on Sam Bitts Road, 0.5 mile west of Route 539 on Route 70 in Manchester Township. The site still operates as a compost facility and recycling center for the town. The inactive landfill on the site would be capped and closed, and re-used as a solar energy farm. The project would include 5 MW of solar panels on 20 acres of the 93-acre site. There is no firm timeline for future development.

6 Heritage Minerals, Manchester Township

Heritage Minerals is a long-planned development on Route 70 in Manchester Township, located on a portion of an over 7,000-acre area of pinelands habitat. The proposed project area is west of APZ II for JB MDL – Lakehurst's Runway 33. Portions of this area are viewed as valuable for environmental conservation purposes (i.e., they contain threatened and endangered species and serve as a source of the region's water supply). About half of the land overlaps the Pinelands National Reserve and the New Jersey Coastal Zone Management Area. The developer is proposing to build 3,700 residential units on 1,000 acres, including a mix of single-family residential and age-restricted residential. A New Jersey regulatory agency denied the developer's more recent efforts to expand the development, stating that its application to build almost 4,000 units violates coastal zone regulations and the settlement agreement. The developer filed an appeal against this denial in the Appellate Division of New Jersey State Superior Court. That appeal is pending. While not considered incompatible because it is outside of JB MDL's noise zones and APZs, the proposed residential development will be in close proximity (approximately one mile) to the installation's runways and may therefore experience some level of aircraft noise, just like other developments in the region.

7 Golden Triangle, Manchester Township

A large residential development project located on Ridgeway Boulevard in the Town of Manchester, known as the "Golden Triangle," is located across from the main entrance of JB MDL – Lakehurst. The project features development of 600 to 800 homes, including 547 multi-family homes. The project is near completion. While large, this residential development is not located in either an APZ or a high-noise zone for JB MDL; however, some flight tracks for JB MDL – Lakehurst (e.g. pattern and inter-facility flight tracks) would occur over this area.

8 Jackson Township

According to local planners, there is substantial development pressure in Jackson Township, which is located northeast of JB MDL (on the JB MDL – Lakehurst side) and can be considered one of the region's growth areas. Proposed developments in Jackson Township are several miles from JB MDL and its AICUZ footprint, but they include several major proposed residential developments. These include a 189-unit housing development on Grawtown Road in the Whitesville neighborhood and "Jackson Trails," a 459-unit residential development on South Hope Chapel Road. In addition, another large, 1,100-unit development, known as the "Jackson Parke" housing development, is also being proposed off Perrineville Road in Jackson Township. Local planners and lawmakers are evaluating these developments against their long-term plans and goals to manage the town's growth.

7. IMPLEMENTATION

Implementation of the *2022 JB MDL AICUZ Study* must be a joint effort between JB MDL and the surrounding communities. This AICUZ Study provides the best source of information to ensure land use planning decisions made by local municipalities are compatible with a future installation presence. This chapter discusses the roles of all partners in this collaborative planning effort.

7.1 MILITARY ROLE

The goal of the AICUZ Program is two-fold: first, to assist local, regional, state, and federal officials in protecting the public health, safety, and welfare by promoting long-term land use compatible with military operations, and, second, to protect military operational capability from the effects of incompatible land use. This program helps mitigate noise and safety concerns for the surrounding communities and advises these communities about potential impacts from flight operations on the safety, welfare, and quality of life of their citizens. The Air Force promotes compatible partnerships between its installations and surrounding communities by being a good neighbor.

JB MDL is responsible for flight safety, noise abatement, and participation in existing local jurisdictional land use planning processes as part of its AICUZ Program responsibilities. Air Force policy and guidance requires that installation leadership periodically review existing practices for flight operations and evaluate these factors in relationship to populated areas and other local situations.

JB MDL will:

- **Ensure that,** wherever possible, air operations planners **route flights over sparsely populated areas** to reduce the exposure of lives and property to a potential accident.
- **Periodically review existing traffic patterns,** instrument approaches, weather conditions, and operating practices, and evaluate these factors in relationship to populated areas and other local conditions. The purpose of this review is to limit, reduce, and control the impact of noise from flying operations on surrounding communities.
- **Consider the establishment of a community forum** between the installation and surrounding stakeholders to discuss land use and other issues of concern; the installation anticipates holding these meetings on an annual basis.
- **Schedule land use planning meetings** to provide a forum for agencies to meet and discuss future development and to address issues that may surface because of new proposals.
- **Provide copies of the AICUZ Study** to local, county, tribal, and regional planning departments and zoning administrators to aid in the planning process, and provide copies of the AICUZ Study to appropriate state and federal agencies.

Other community engagement opportunities include hosting base tours for community leaders and organizations, promoting community volunteerism, and hosting the biennial "Power in the Pines" open house and air show.

Preparation and presentation of this *2022 JB MDL AICUZ Study* is one phase in continuing Air Force participation in the local planning process. The Air Force recognizes that, as the local community updates its land use plans, JB MDL must be ready to provide additional input, as needed.

7.2 STATE/REGIONAL ROLES

As noted in Section 6.2, New Jersey is a home rule state, which allows counties, municipalities, and cities to manage local planning. Thus, when the townships and boroughs within Burlington and Ocean counties periodically review and update their local land use plans, AICUZ-specific information should be updated to include targeted zoning and land use controls that will help prevent future incompatibility. Recommendations for working with local governments to encourage compatible land use is discussed below, in Section 7.3.

Readiness and Environmental Protection Integration

The REPI Program is a key tool used by DoD and its partners to protect the military's ability to train, test, and operate. DoD created the REPI Program in response to the development of lands and loss of habitat in the vicinity of or affecting its installations, ranges, and airspace that can lead to restrictions or costly and inadequate training and testing alternatives. Through REPI, DoD works with state and local governments, conservation organizations, and willing private landowners to address these challenges to the military mission and the viability of DoD installations and ranges. The REPI Program has enjoyed broad bipartisan support both in the US Congress and among groups representing state and local officials.

To that end, JB MDL could continue to pursue possible opportunities to preserve and protect mission-sensitive areas surrounding the installation. Through FY 2019, DoD and its partners have spent over $43.8 million on REPI projects, preserving 9,192 acres around JB MDL within the State of New Jersey in their ongoing collaboration with local and regional stakeholders, such as Burlington and Ocean counties. JB MDL's REPI projects implement recommendations from the regional joint land use study (JLUS) to protect high-priority safety and noise zones, and acquire conservation easements to preserve wetlands, habitat, and water resources.

As part of this program, a two-mile buffer around the installation was established to preserve remaining open space and agricultural lands; this buffer provides the added benefit of preserving compatible land uses around the installation.

The New Jersey State Planning Commission

The New Jersey State Planning Commission, created by the New Jersey State Planning Act in 1986, has 17 members and represents state and local government and the public. The commission meets monthly and routinely revises and adopts a state plan to guide municipal, county, and regional planning; state agency functional planning; and infrastructure investment decisions. *The New Jersey State Development and Redevelopment Plan (2001)* identifies military installations as a designated planning area; however, because these lands are under federal jurisdiction, they are not subject to the plan.

Per the act, whenever any state department, office, agency, authority, or commission proposes a plan that would impact land uses within 3,000 feet of a military facility, the director of the Office of State Planning in the Department of Community Affairs must be notified prior to finalizing the plan. Once notified, the director will contact the relevant military facility commander to solicit comments regarding land use compatibility issues. The proposed plan may not be finalized until these comments have been reviewed.

The New Jersey Military Installation Growth and Development Task Force

In 2015, recognizing the significant security value and major economic impact of New Jersey's military installations, the New Jersey Military Installation Growth and Development Task Force was created to help support New Jersey's military bases. After touring the state's military installations, receiving briefings from commanding officers, and hosting business roundtable discussions in each installation's community, the task force presented a series of recommendations. Among the recommendations was to enable greater cooperation between military installations and local communities, including developing land use initiatives that promote compatible land use. The task force encouraged the following actions for local governments:

- **Conduct a JLUS,** which was conducted in 2009 for the counties of Ocean and Burlington, implement the resulting principles from the study, and revisit its documents regularly;
- **Schedule regular meetings** with utilities and local water, wastewater, and power authorities to discuss the collaborative planning process;
- **Share proposed master plan updates** and zoning changes with nearby military installations before adoption;

- **Discourage unnecessarily tall buildings** around installations that limit flight paths or sight lines of aircraft;
- **Reduce residents' exposure to noise** from planes, helicopters, and firing ranges by avoiding building residential areas too close to installations; and
- **Preserve open space** near military installations.

The task force also encouraged the New Jersey Defense Enhancement Coalition to continue its efforts. The coalition, located in the Borough of Wrightstown, functions as a non-profit community support group focused on sustaining JB MDL. Funding from individuals, businesses, local governments, and private citizens is used by the coalition to educate the community and local leaders on the economic importance of JB MDL and its missions.

The New Jersey Pinelands Commission

Given its location within the New Jersey Pinelands area, JB MDL also has a long-standing relationship with the New Jersey Pinelands Commission, the regional planning and regulatory entity that guides land use, development, and natural resource protection programs in the state Pinelands area. The New Jersey Pinelands Commission reviews and approves all municipal projects (e.g., roads, schools, parking lots, etc.), as well as all county and municipal land use ordinances, master plans, and zoning maps, for consistency with the commission's comprehensive management plan.

Other Regional Collaborations

JB MDL has also participated in several joint regional planning efforts. The *Joint Base McGuire-Dix-Lakehurst Joint Land Use Study (JLUS)* for Counties of Ocean and Burlington, discussed in **Section 7.3,** was completed in 2009. The subsequent Regional Wastewater and Growth Management Plan is a three-phase study to address wastewater treatment concerns of four contiguous municipalities on the north side of JB MDL. The *Regional Transportation Mobility Study* assesses current and future transportation issues within 5 miles of JB MDL, taking into account mission growth and projected population growth.

In addition, in late 2021, a *Compatible Use Plan (CUP) (formerly JLUS)* was initiated by the local governments surrounding JB MDL. A CUP is a cooperative land use planning effort between an affected local government and the military installation. In 1985, Congress authorized the DoD to make community planning assistance grants *Title 10 U.S.C. Section 2391* to state and local government to help better understand and incorporate the AICUZ technical data into local planning programs. CUP is managed by the U.S. Department of Defense, Office of Economic Adjustment (OEA). The goal is to ensure that development near a military installation is compatible with the base's mission, while at the same time ensuring the public health, safety, and quality of life of the community. The Compatible Use Plan program has become more important as urban development in many areas has encroached closer to a military base that was once in a remote location. The recommendations in the CUP present a rationale and justification, and provide a policy framework to support adoption and implementation of compatible development measures designed to prevent urban encroachment; safeguard the military mission; and protect the public health, safety, and welfare.

7.3 LOCAL GOVERNMENT ROLE

The role of the local government is to enact planning, zoning, and development principles and practices that are compatible with the installation and protect the installation's mission. The residents of the surrounding community have a long history of working with personnel from JB MDL. Adoption of the following recommendations during the revision of relevant land use planning or zoning regulations will strengthen this relationship, increase the health and safety of the public, and protect the integrity of the installation's flying mission:

- Local government planners consider AICUZ policies and guidelines when developing or revising city comprehensive plans and use AICUZ overlay maps and Air Force land use compatibility guidelines (see Appendix A) to evaluate existing and future land use proposals.
- Ensure that new development applications or properties that are applying for a change of use are submitted via the local municipal planning points of contact to JB MDL to afford the opportunity for the installation to assess those applications for potential impacts on defense missions. The JB MDL PA Office can provide a land use planning point of contact.
- Adopt or modify zoning ordinances to reflect the compatible land uses outlined in the *AICUZ Study,* including the creation of military airport overlay zones.
- Local governments review their capital improvement plan, infrastructure investments, and development policies to ensure they do not encourage incompatible land use patterns near JB MDL, with particular emphasis on utility extension and transportation planning.
- Local governments implement height and obstruction ordinances that reflect current Air Force and 14 CFR 77 requirements, presented in this study as HAFZs.
- Fair disclosure ordinances be enacted to require disclosure to the public for those AICUZ items that directly relate to military operations at JB MDL.
- Where allowed, local governments require real estate disclosure for individuals purchasing or leasing property within noise zones or CZs and/or APZs.
- Enact or modify building codes to ensure that any new construction near JB MDL has the recommended noise level reduction measures incorporated into the design and construction of structures.
- Government planning bodies monitor proposals for tall structures, such as wind turbines and communication towers, to ensure that new construction does not pose a hazard to navigable airspace around JB MDL. Where appropriate, coordinate with the FAA on the height of structures.
- Local government land use plans and ordinances reflect AICUZ recommendations for development in CZs, APZs, and noise zones.

- Local governments consult with JB MDL on planning and zoning actions that have the potential to affect installation operations.
- Invite the Air Force leadership to be ex officio members on boards, commissions, and regional councils addressing long-range development and other planning policies.
- Encourage the development of a working group of city, township, borough, county, and JB MDL representatives to discuss land use concerns and major development proposals that could affect military operations.

7.4 COMMUNITY ROLE

Neighboring residents and installation personnel have a long-established history of working together for the mutual benefit of the JB MDL mission and local community. Adoption of the following recommendations will strengthen this relationship, protect the health and ensure the safety of the public, and help protect the integrity of the installation's defense mission:

Civic Organizations

- Ocean County's Military Support Alliance of New Jersey – An organization whose mission is dedicated to consistent civic-military engagement to promote steadfast support of JB MDL and the community through education, advocacy, connections and friendship.
- Burlington County Military Affairs Committee (BCMAC) – A non-profit, fully volunteer-run organization that supports the military at JB MDL. BCMAC was established in 1987 by the Burlington County Board of Commissioners (then Freeholders), and acts as a liaison between the installation's leadership and the civilian community to promote a mutual understanding of one another's mission and to assist and support the military wherever possible.

Real Estate Professionals and Brokers

- Know where noise zones and CZs/APZs associated with both the airfields and the range activities encumber land near the installation and invite installation representatives to brokers' meetings to discuss the AICUZ Program with real estate professionals.
- Disclose noise impacts to all prospective buyers of properties within areas greater than 65 dB DNL, 57 dB CDNL (i.e., the LUPZ), and 87 PK15, or within the CZs or APZs.
- Require the real estate multiple listing service to disclose noise zones and CZs or APZs for all listings.

Developers

- Know where the noise zones and CZs or APZs encumber land near the installation. Consult with JB MDL on proposed developments within the entire AICUZ footprint.
- Participate in local discussions regarding existing zoning ordinances and subdivision regulations. To support the compatible land uses outlined in this AICUZ Study, implement a zoning overlay district based on noise contours and CZs or APZs.

Local Citizens

- Participate in local forums with the installation to learn more about the installation's missions.
- Become informed about the AICUZ Program and learn about the program's goals, objectives, and value in protecting the public's health, safety, and welfare.
- When considering property purchases, ask local real estate professionals, city planners, and installation representatives for noise and accident potential information.

While the installation and community are separated by a fence, JB MDL recognizes that its activities and operations may affect the community. Likewise, community activities and development decisions can affect JB MDL's ability to complete its national defense missions. The local military and community goals can be mutually achieved through a combination of collaborative planning and partnerships, open communication, and close relationships. This AICUZ Study can provide a foundation for communication and cooperation to ensure that the community and its hometown military installation can continue to coexist for many years.

Questions about the AICUZ Program may be directed to the installation **PA Office at (609) 754-2104 or 87.abw.pa@us.af.mil.**

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APPENDIX A

Land Use Compatibility Tables

Table A-1 provides compatibility recommendations based on historical aircraft mishap locations on or near air installations. The primary land use objective is to discourage people-intensive land uses in areas of high accident potential.

While the table uses *Standard Land Use Coding Manual (SLUCM)* categories for organization, it varies from SLUCM as the coding system does not differentiate based on population density. Some uses warrant additional evaluation due to the variation of densities of people, intensity of use, or other characteristics that could impact safety of flight. Floor Area Ratio (FAR) recommendations are included within the table to guide suggested maximum density for non-residential uses. General notes and specific footnotes at the bottom of the table provide additional information and compatibility considerations.

These recommendations are intended to support compatible land use planning both on and off base; they do not constitute a federal determination that any use of land is acceptable or unacceptable under local zoning.

Table A-1

Table A-1 Recommended Land Use Compatibility for Clear Zones and Accident Potential Zones

Land Use Name and SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
Residential Use Group (SLUCM Category 10)				
Residential Uses, Inclusive of All Residential Units I.e., Any Type of Single or Multiple Dwelling Units.	N	N	Y[1,2]	Maximum density of 2 dwelling units per acre
Mobile Home Parks or Courts	N	N	N	
Transient Lodgings	N	N	N	
Manufacturing Use Group (SLUCM Categories 20 & 30)				
Food and Kindred Products; Textile Mill Products; Manufacturing; Stone, Clay, Glass, Primary Metal and Fabricated Metal Products; Manufacturing	N	N	Y	Max FAR 0.56 in APZ II
Fabric Products; Leather and Similar Materials; Chemicals and Allied Products; Petroleum Refining and Related Industries; Rubber and Miscellaneous Plastic Products; Manufacturing; Precision Manufacturing	N	N	N	
Lumber and Wood Products; Manufacturing Furniture and Fixtures; Paper and Allied Products; Printing, Publishing, and Allied Industries Miscellaneous Manufacturing	N	Y	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
Transportation, Communication and Utilities Use Group (SLUCM Category 40)				
Rail, Motor Vehicle, Aircraft, Marine etc. Transportation, Highway and Street Right-Of-Way, Automobile Parking, and Utilities, Telephone, Cellular and Radio Communication	N[3]	Y[4]	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
Solid Waste Disposal (Landfills, Incinerators, etc.)	N	N	N	
Trade (SLUCM Category 50)				
Wholesale Trade	N	Y	Y	Maximum FAR of 0.28 in APZ I & .56 in APZ II
Retail Trade – Building Materials	N	Y	Y	Maximum FAR of 0.20 in APZ-I and 0.40 in APZ-11;
Retail Trade – Hardware, Paint, and Farm Equipment Stores,	N	Y	Y	Maximum FAR of 0.12 in APZ I and 0.24 in APZ II
Retail Trade – Including Neighborhood Centric Shops	N	N	Y	Maximum FAR of 0.16 in APZ II
Mass Retailing, Super Stores, Strip Malls, Shopping Centers,[5] Discount Clubs, Home Improvement Stores, etc.; Eating and Drinking Establishments	N	N	N	

Table A-1 Recommended Land Use Compatibility for Clear Zones and Accident Potential Zones

Land Use Name and SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
Retail Trade – Food Such as Groceries, Bakeries, Confectionaries, Meat Markets, and Fast Food Establishments	N	N	Y	Maximum FAR of 0.24 in APZ II
Retail Trade – Automotive, Marine Craft, Aircraft, and accessories	N	Y	Y	Maximum FAR of 0.14 in APZ I & 0.28 in APZ II
Retail Trade – Apparel and Accessories, Furniture, Home, Furnishings and Equipment	N	N	Y	Maximum FAR of 0.28 in APZ II
Other Retail Trade	N	N	Y	Maximum FAR of 0.16 in APZ II
Services (SLUCM Category 60)				
Finance, Insurance, Real Estate, Personal, Professional and Miscellaneous Services (Office Uses Only) Services	N	N	Y	Maximum FAR of 0.22 in APZ II
Cemeteries	N	Y[6]	Y[6]	
Warehousing and Storage Services	N	Y	Y	Maximum FAR of 1.0 in APZ I; 2.0 in APZ II
Repair Services and Contract Construction	N	Y	Y	Maximum FAR of 0.11 APZ I; 0.22 in APZ II
Hospitals, Nursing Homes, and Other Medical Facilities; Educational Services, Childcare Services, Child Development Centers, and Nurseries	N	N	N	
Government Services	N	N	Y	Maximum FAR of 0.24 in APZ II
Cultural, Entertainment and Recreational Use Group (SLUCM Category 70)				
Nature Exhibits	N	Y[7]	Y[7]	
Cultural Activities, Auditoriums, Concert Halls, Places of Worship; Outdoor Music Shells, Museums, Outdoor Displays, Amphitheaters, Sports Arenas, Spectator Sports, Resorts and Group Camps, or Other Places of Assembly	N	N	N	
Amusements – Fairgrounds, Miniature Golf, Driving Ranges; Amusement Parks, etc.	N	N	Y[11]	
Recreational Activities (Including Golf Courses, Riding Stables, Water Recreation), Parks	N	Y[7]	Y[7]	Maximum FAR of 0.11 in APZ I; 0.22 in APZ II
Other Cultural, Entertainment and Recreation	N	Y[6]	Y[6]	

Continued

Continued

Table A-1 Recommended Land Use Compatibility for Clear Zones and Accident Potential Zones

Land Use Name and SLUCM Category	Clear Zone	APZ-I	APZ-II	Maximum Density
Resource Production and Extraction (SLUCM Category 80)				
Agriculture and Livestock Farming, Including Grazing and Feedlots	Y[8]	Y[8]	Y[8]	
Agriculture Related Activities	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Forestry Activities[9]	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Fishing Activities	N[10]	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Mining Activities	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Other Resource Production or Extraction	N	Y	Y	Maximum FAR of 0.28 in APZ I; 0.56 in APZ II
Other (SLUCM Category 90)				
Undeveloped Land	Y	Y	Y	
Water Areas	N	N	N	

Key

Y (Yes) Land use and related structures compatible without restrictions.

N (No) Land use and related structures are not compatible and should be prohibited.

Yx Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

Nx No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

Notes: General Notes for All Uses

a. The suggested maximum occupancy for commercial, service, or industrial buildings or structures in APZ I is 25 people per acre, and 50 people per acre in APZ II. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I, and maximum assemblies of 50 people an acre in APZ II.

b. Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I/II. For APZ I, the formula is FAR = 25 people an acre/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)). The formula for APZ II is FAR = 50/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)).

c. No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above ground utility and communications lines should normally be located in Clear Zone areas on or off the air installation. The Clear Zone is subject to the most severe restrictions.

d. Safety of flight should be considered when evaluating development that includes explosive potential; generates smoke, steam, am or dust; and steam, creates electronic interference; lighting or glare; poor tall structures.

e. The suggested maximum occupancy for commercial, service, or industrial buildings or structures in APZ I is 25 people per acre, and 50 people per acre in APZ II. Outside events should normally be limited to assemblies of not more than 25 people an acre in APZ I, and maximum assemblies of 50 people an acre in APZ II.

f. Recommended FARs are calculated using standard parking generation rates for various land uses, vehicle occupancy rates, and desired density in APZ I/II. For APZ I, the formula is FAR = 25 people an acre/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)). The formula for APZ II is FAR = 50/ (Average Vehicle Occupancy x Average Parking Rate x (43560/1000)).

g. No structures (except airfield lighting and navigational aids necessary for the safe operation of the airfield when there are no other siting options), buildings, or above ground utility and communications lines should normally be located in Clear Zone areas on or off the air installation. The Clear Zone is subject to the most severe restrictions.

h. Safety of flight should be considered when evaluating development that includes explosive potential; generates smoke, steam, am or dust; and steam, creates electronic interference; lighting or glare; poor tall structures.

i. Development of renewable energy resources, including solar and geothermal facilities and wind turbines, may impact military operations through hazards to flight or electromagnetic interference. Each new development should be analyzed for compatibility on a case-by-case basis that considers both the proposal and potentially affected mission.

j. Water features that may attract waterfowl and present bird/wildlife aircraft strike hazards (BASH), or activities that produce dust or light emissions that could affect pilot vision are generally not compatible and should be evaluated on a case-by-case basis.

k. Evaluation of potential land management actions occurring on public and private lands, such as prescribed burns, should identify the hazard (i.e., visual impairment) to aircraft flight safety and to de-conflict operations occurring at the base (i.e., scheduled exercises and training requirements).

l. This compatibility table identifies places of worship as a cultural gathering. However, religious institutions provide a wide variety of services and in these instances refer to the applicable category.

Footnotes Specific to Certain Land Uses

1. The suggested maximum density for detached single-family housing is two dwelling units per acre to encourage retention of farming and open space.

2. Where a parcel is partially located in an APZ II, clustered development is encouraged on the portion outside the APZ while maximizing open space within the APZ.

3. All roads within the Clear Zone are discouraged, but if required, they should not be wider than two lanes and the rights-of-way should be fenced (frangible) and not include sidewalks or bicycle trails. Nothing associated with these roads should violate obstacle clearance criteria.

4. Above ground passenger terminals and above ground power transmission or distribution lines are not recommended. Prohibited power lines include high-voltage transmission lines and distribution lines that provide power to cities, towns, or regional power for unincorporated areas.

5. A shopping center is an integrated group of commercial establishments that is a planned, developed, owned, or managed as a unit. Shopping center types include strip, neighborhood, community, regional, and super-regional facilities anchored by small businesses, a supermarket or drug store, discount retailer, department store, or several department stores, respectively. The maximum recommended FAR should be applied to the gross leasable area of the shopping center.

6. Land uses in the APZs should be passive open space; ancillary places of public assembly are not recommended.

7. Low occupancy facilities are compatible with these uses; however, playgrounds and marinas are not recommended.

8. Activities that attract concentrations of birds creating a hazard to aircraft operations are not compatible.

9. Lumber and timber products removed due to establishment, expansion, or maintenance of Clear Zone lands owned in fee will be disposed of in accordance with applicable DoD guidance.

10. Controlled hunting and fishing may occur for the purpose of wildlife management.

11. Amusement centers, family entertainment centers or amusement parks designed or operated at a scale that could attract or result in concentrations of people, including employees and visitors, greater than 50 people per acre at any given time are incompatible in APZ II run-ups. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

Table A-2

Table A-2 provides compatibility recommendations based on yearly A-weighted Day-Night Average Sound Level (ADNL) [the 'A' is implied in DNL when discussing aircraft operations] on and around installations. The primary land use objective is to discourage noise-sensitive land uses in areas of higher noise exposure.

The table is organized based on Standard Land Use Coding Manual (SLUCM) categories; however, it varies from SLUCM as the coding system does not differentiate based on noise-sensitivity. Some uses warrant additional evaluation due to potential for annoyance and activity interference. General notes and specific footnotes at the bottom of the table provide additional information and considerations for compatibility determinations.

These recommendations are intended to support compatible land use planning both on and off-base; they do not constitute a federal determination that any use of land is acceptable or unacceptable under local zoning.

Table A-2 Recommended Land Use Compatibility for Noise Zones

	A-Weighted Dnl Levels (dB)					
Land Use Name and SLUCM Category	**<65**	**65-70**	**70-75**	**75-80**	**80-85**	**85+**
Residential Use Group (SLUCM Category 10)						
Residential Uses, Inclusive Of All Residential Units (i.e., Any Type of Single or Multiple Dwelling Units)	Y	N[1]	N[1]	N	N	N
Mobile Home Parks or Courts	Y	N	N	N	N	N
Transient Lodgings	Y	N[1]	N[1]	N[1]	N	N
Manufacturing Use Group (SLUCM Categories 20 & 30)						
Manufacturing and Industrial Uses	Y	Y	Y[2]	Y[3]	Y[4]	N
Precision Manufacturing	Y	Y	Y[2]	Y[3]	N	N
Transportation, Communication and Utilities Use Group (SLUCM Category 40)						
Rail, Motor Vehicle, Aircraft, Marine and Other Transportation, and Communication Systems and Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Highway and Street Right-of-Way, Automobile Parking	Y	Y	Y	Y	Y	N
Telephone, Cellular and Radio Communication	Y	Y	Y[2]	Y [3]	N	N
Trade (Slucm Category 50)						
Wholesale Trade	Y	Y	Y[2]	Y[3]	Y[4]	N
Building Materials, Hardware and Farm Equipment Sales	Y	Y	Y[2]	Y[3]	Y[4]	N
Mass Retailing, Super Stores, Strip Malls, Shopping Centers, Discount Clubs, Home Improvement Stores, etc., Eating and Drinking Establishments	Y	Y	Y[2]	Y[3]	N	N

Table A-2 Recommended Land Use Compatibility for Noise Zones

Land Use Name and SLUCM Category	A-Weighted Dnl Levels (dB)					
	<65	65-70	70-75	75-80	80-85	85+
Services (Slucm Category 60)						
Finance, Insurance and Real Estate, Personal, Professional and Miscellaneous Services; Religious Activities	Y	Y	Y[2]	Y[3]	N	N
Cemeteries	Y	Y	Y[2]	Y[3]	Y[4]	Y[5]
Warehousing/Storage and Repair Services	Y	Y	Y[2]	Y[3]	Y[4]	N
Hospitals/Medical, Childcare and Development Services, Educational Facilities	Y	Y[2]	Y[3]	N	N	N
Nursing homes	Y	N[1]	N[1]	N	N	N
Governmental	Y	Y	Y[2]	Y[3]	N	N
Cultural, Entertainment and Recreational Use Group (SLUCM Category 70)						
Cultural Activities, Auditoriums and Concert Halls	Y	Y[2]	Y[3]	N	N	N
Nature Exhibits	Y	Y	N	N	N	N
Public Assembly	Y	Y	N	N	N	N
Outdoor Music Shells, Amphitheaters	Y	N	N	N	N	N
Outdoor Sports Arenas, Spectator Sports	Y	Y[6]	Y[6]	N	N	N
Amusements	Y	Y	Y	N	N	N
Outdoor Recreational Activities	Y	Y	Y[2]	Y[3]	N	N
Resorts, Camps, Parks and Other C/E/R Activities	Y	Y	Y[2]	N	N	N
Resource Production and Extraction (SLUCM Category 80)						
Agriculture and Forestry	Y	Y[7]	Y[8]	Y[9]	Y[9]	Y[9]
Livestock Farming, Animal Breeding	Y	Y[7]	Y[8]	N	N	N
Fishing, Mining and Other Resource Production or Extraction	Y	Y	Y	Y	Y	Y

Key

Y (Yes) Land use and related structures compatible without restrictions.

N (No) Land use and related structures are not compatible and should be prohibited.

Yx Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

Nx No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

Notes: General Notes for All Uses

a. Compatibility designations in Table A-2 generally refer to the principal use of the site. If other uses with greater sensitivity to noise are proposed, a determination of compatibility should be based on that use which is most adversely affected by operational noise.

b. When appropriate, noise level reduction (NLR) may be necessary to achieve compatibility. NLR (outdoor to indoor) is achieved through the incorporation of sound attenuation into the design and construction of a structure. Measures to achieve an indoor noise reduction do not necessarily solve noise issues outside the structure and additional evaluation may be warranted. Building location, site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure, particularly from aircraft ground maintenance run-ups. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

c. Land uses below 65db DNL are generally compatible. However, localities, when evaluating the application of these guidelines, should consider possible annoyance tied to land uses that involve predominately outdoor activities, or where quiet is a basis for the use.

d. Land use that involves outdoor activities in areas above 80db DNL are not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present.

Footnotes Specific to Certain Land Uses

1. Residential

a. Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in DNL 65-70 and strongly discouraged in DNL 70-75. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones.

b. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 decibels (dB) in DNL 65-70 and 30 dB in DNL 70-75 should be incorporated into building codes and be considered in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in DNL 75-80.

c. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year-round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.

2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

4. Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

5. Buildings where public is received, are not recommended.

6. Land use is compatible provided special sound reinforcement systems are installed.

7. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 25dB should be incorporated into the design.

8. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 30dB should be incorporated into the design.

9. Residences are not compatible.

Table A-3

Table A-3 provides compatibility recommendations based on peak noise levels (PK) typically associated with small-arms range operations on and around installations. The primary land use objective is to discourage noise-sensitive land uses in areas of higher noise exposure.

The table is organized based on SLUCM categories; however, it varies from SLUCM as the coding system does not differentiate based on noise-sensitivity. General notes and specific footnotes at the bottom of the table provide additional information and considerations for compatibility determinations.

These recommendations are intended to support compatible land use planning both on and off-base; they do not constitute a federal determination that any use of land is acceptable or unacceptable under local zoning.

Table A-3 Recommended Land Use Compatibility for Small Arms Noise

	Peak Levels (unweighted)		
Land Use Name and SLUCM Category	**<87dB**	**87-104dB**	**>104 dB**
Residential Use Group (Slucm Category10)			
Residential Uses, Inclusive of All Residential Units i.e. Any Type of Single or Multiple Dwelling Units.	Y	N[1]	N
Mobile Home Parks or Courts	Y	N	N
Transient Lodgings	Y	N[1]	N
Manufacturing Use Group (Slucm Categories 20 & 30)			
Manufacturing and Industrial Uses (Food and Kindred Products; Textile Mill Products; Stone, Clay, Glass, Primary Metal and Fabricated Metal Products; Fabric Products; Leather and Similar Materials; Chemicals and Allied Products; Petroleum Refining and Related Industries; Rubber and Miscellaneous Plastic Products; Lumber and Wood Products; Furniture and Fixtures; Paper and Allied Products; Printing, Publishing, and Allied Industries, Other Miscellaneous Manufacturing)	Y	Y[2]	Y[3]
Precision Manufacturing (Professional Scientific and Controlling Instruments; Photographic and Optical Goods)	Y	Y[2]	Y[3]
Transportation, Communication and Utilities Use Group (Slucm Category 40)			
Rail, Motor Vehicle, Aircraft, Marine and Other Transportation, and Communication Systems and Utilities	Y	Y[2]	Y[3]
Highway and Street Right-of-Way, Automobile Parking	Y	Y	Y
Telephone, Cellular and Radio Communication	Y	Y[2]	Y[3]
Solid Waste Disposal, (Landfills, Incinerators, etc.)	Y	Y	Y

Continued

Continued

Table A-3 Recommended Land Use Compatibility for Small Arms Noise

Land Use Name and SLUCM Category	Peak Levels (unweighted) <87dB	87-104dB	>104 dB
Trade (Slucm Category 50)			
Wholesale Trade	Y	Y[2]	Y[3]
Retail Trade – Building Materials, Hardware, Paint, and Farm Equipment Sales; Food Such As Groceries, Bakeries, Confectionaries, Meat Markets, and Fast Food Establishments; Automotive, Marine Craft, Aircraft, and Accessories; Apparel and Accessories, Furniture, Home, Furnishings and Equipment; Other Retail Trade	Y	Y[2]	Y[3]
Mass Retailing, Super Stores, Strip Malls, Shopping Centers, Discount Clubs, Home Improvement Stores, etc. Eating and Drinking Establishments.	Y	Y[2]	Y[3]

Key

Y (Yes) Land use and related structures compatible without restrictions.

N (No) Land use and related structures are not compatible and should be prohibited.

Yx Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

Nx No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

SLUCM Standard Land Use Coding Manual

Note: Small caliber is defined as a weapon with a bore diameter of .50 caliber and below.

Notes: General Notes for All Uses

a. Compatibility designations in Table 1 generally refer to the principal use of the site. If other uses with greater sensitivity to noise are proposed, a determination of compatibility should be based

b. Although local demand for on – or off-post housing may require noise-sensitive land uses within Noise Zone II, such land use is generally not recommended. The absence of viable alternative development options should be determined and an evaluation should be conducted locally, prior to approval indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Existing residential development is considered as pre-existing, non-conforming land uses.

c. When appropriate, noise level reduction (NLR) may be necessary to achieve compatibility. NLR (outdoor to indoor) is achieved through the incorporation of sound attenuation into the design and construction of a structure. Measures to achieve an indoor noise reduction do not necessarily solve noise issues outside the structure and additional evaluation may be warranted. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces.

Footnotes

1. Residential/Services

- **a.** Although local conditions regarding the need for housing and services may support noise-sensitive use in these zones, residential use is discouraged in 87-104 dB Peak and strongly discouraged in > 104 dB Peak.
- **b.** Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 30 decibels (dB) in 87-104 dB Peak should be incorporated into building codes and be considered in individual approvals. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 10 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year – round.

2. Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

3. Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

4. Where residences are permitted, measures to achieve outdoor to indoor NLR of at least 30dB should be incorporated into the design.

5. Residences are not compatible.

6. This compatibility table identifies places of worship as a cultural gathering. However, religious institutions provide a wide variety of services and in these instances refer to the applicable category.

7. The land uses within this category include necessary associated resource management activities, for example, wildfire management activities for forestry.

Table A-4

Table A-4 provides compatibility recommendations based on yearly C-weighted DNL/CNEL Levels [the 'C' is implied in DNL when discussing low frequency, impulsive or explosive noises, including range operations] on and around installations. The primary land use objective is to discourage noise-sensitive land uses in areas of higher noise exposure.

The table is organized based on SLUCM categories; however, it varies from SLUCM as the coding system does not differentiate based on noise-sensitivity. General notes and specific footnotes at the bottom of the table provide additional information and considerations for compatibility determinations.

These recommendations are intended to support compatible land use planning both on and off-base; they do not constitute a federal determination that any use of land is acceptable or unacceptable under local zoning.

Table A-4 Land Use Compatibility in Large Arms and Explosives Noise Zones

	C-weighted DNL/CNEL Levels			
Land Use Name & Slucm Category	<57dB	57-62dB	62-70dB	>70 dB
Residential Use Group (SLUCM Category 10)				
Residential Uses, Inclusive of all Residential Units i.e. Any Type of Single or Multiple Dwelling Units.	Y	Y[1]	N[2,3]	N[3]
Mobile Home Parks or Courts	Y	Y[1]	N[2,3]	N[3]
Transient Lodgings	Y	Y[1]	Y	N
Manufacturing Use Group (SLUCM Categories 20 & 30)				
Manufacturing and Industrial Uses (Food and Kindred Products; Textile Mill Products; Stone, Clay, Glass, Primary Metal and Fabricated Metal Products; Fabric Products; Leather and Similar Materials; Chemicals and Allied Products; Petroleum Refining and Related Industries; Rubber and Miscellaneous Plastic Products; Lumber and Wood Products; Furniture and Fixtures; Paper and Allied Products; Printing, Publishing, and Allied Industries, Other Miscellaneous Manufacturing)	Y	Y	Y[4]	Y[4]
Precision manufacturing (professional scientific and controlling instruments; photographic and optical goods)	Y	Y	N	N
Transportation, communication and utilities Use Group (SLUCM Category 40)				
Rail, Motor Vehicle, Aircraft, Marine and Other Transportation, and Communication Systems and Utilities	Y	Y	Y	Y[4]
Highway and Street Right-of-Way, Automobile Parking	Y	Y	Y	Y
Telephone, Cellular and Radio Communication	Y	Y	Y	Y[4]
Solid Waste Disposal (Landfills, Incinerators, etc.)	Y	Y	Y	Y

Continued

Continued

Table A-4 Land Use Compatibility in Large Arms and Explosives Noise Zones

Land Use Name & Slucm Category	C-weighted DNL/CNEL Levels			
	<57dB	57-62dB	62-70dB	>70 dB
Trade (SLUCM Category 50)				
Wholesale Trade	Y	Y	Y	N
Retail Trade – Building Materials, Hardware, Paint, and Farm Equipment Sales; Food Such As Groceries, Bakeries, Confectionaries, Meat Markets, and Fast Food Establishments; Automotive, Marine Craft, Aircraft, and Accessories; Apparel and Accessories, Furniture, Home, Furnishings and Equipment; Other Retail Trade	Y	Y	Y	N
Mass Retailing, Super Stores, Strip Malls, Shopping Centers, Discount Clubs, Home Improvement Stores, etc.				
Eating and Drinking Establishments	Y	Y	Y	N
Services (SLUCM Category 60)				
Finance, Insurance and Real Estate, Personal, Professional and Miscellaneous Services (office Uses Only)	Y	Y	Y	N
Cemeteries	Y	Y	Y	N
Warehousing/Storage & Repair Services	Y	Y	Y[4]	Y[4]
Hospitals/Medical, Child Care & Development Services, Nursing Homes, Educational Facilities	Y	Y[1]	N	N
Governmental	Y	Y	Y	N
Cultural, entertainment and recreational (SLUCM Category 70)				
Cultural Activities, Auditoriums & Concert Halls	Y	Y[1]	N	N
Nature Exhibits, Cultural Activities, Auditoriums, Concert Halls, Places of Worship; Outdoor Music Shells, Museums, Outdoor Displays, Amphitheaters, Sports Arenas, Spectator Sports, Resorts and Group Camps, or Other Places of Assembly	Y	Y[1]	N	N
Amusements – Fairgrounds, Miniature Golf, Driving Ranges; Amusement Parks, etc.	Y	Y	Y	N
Outdoor Recreational Activities – Golf Courses, Riding Stables, Water Recreation, Parks, etc.	Y	Y	Y	N
Resorts, Campground	Y	Y	N	N

Continued

Continued

Table A-4 Land Use Compatibility in Large Arms and Explosives Noise Zones

Land Use Name & Slucm Category	C-weighted DNL/CNEL Levels <57dB	57-62dB	62-70dB	>70 dB
Resource Production and Extraction5 (SLUCM Category 80)				
Agriculture (Including Grazing and Feedlots) and Forestry	Y	Y	Y	Y
Livestock Farming, Animal Breeding	Y	Y	N	N
Fishing, Mining and Other Resource Production or Extraction	Y	Y	Y	Y

Key

Y (Yes) Land use and related structures compatible without restrictions.

N (No) Land use and related structures are not compatible and should be prohibited.

Yx Yes with restrictions. The land use and related structures generally are compatible. However, see note(s) indicated by the superscript.

Nx No with exceptions. The land use and related structures are generally incompatible. However, see note(s) indicated by the superscript.

SLUCM Standard Land Use Coding Manual

Note: Large arms is defined as a weapon with a bore diameter of 20 millimeter and above.

General Notes for All Uses

Compatibility designations in Table 4 generally refer to the principal use of the site. If other uses with greater sensitivity to noise are proposed, a determination of compatibility should be based on that use which is most adversely affected by noise.

Footnotes

1. The 57-62 dB CDNL (Land Use Planning Zone (LUPZ) functions as a buffer for the 62-70 dB CDNL area. Local governments have implemented land use planning measures in areas <62 dB CDNL. In addition to mitigating current noise impacts, implementing land use controls within this contour can create a buffer and limit development trends to prevent the possibility of future noise conflicts.

2. Although local demand for on – or off-installation housing may support noise-sensitive land uses within 62-70 dB CDNL, such land use is generally not compatible within 62-70 dB CDNL. Measures to achieve overall noise level reduction inside structures do not solve noise difficulties outside the structure. Barriers are not effective reducing the noise generated from large caliber military weapons firing (artillery, tank, etc.) or the detonation of explosives. Additionally, noise level reduction inside structures does not mitigate the vibration generated by the low-frequency energy of large caliber weapons firing and detonations.

3. Existing noise-sensitive land uses are considered as pre-existing incompatible land uses. In most cases these uses are not a risk to mission sustainment or a community's quality of life. Most long-term members near military installations or activities acknowledge hearing military operations and activities, but they are usually not alarmed or bothered by the noise. However, landowners, occupants, or other users may change over time, therefore the comfort or familiarity with military noise will not remain permanent or constant. Effort should be made to limit further incompatible development, seek mitigation efforts, and where practicable to roll back pre-existing incompatible land uses.

4. Although noise levels may be compatible, exercise caution in siting any activity that may be sensitive to vibration.

5. The land uses within this category include necessary associated resource management activities, for example, wildfire management activities for forestry.

6. This compatibility table identifies places of worship as a cultural gathering. However, religious institutions provide a wide variety of services and in these instances refer to the applicable category.

APPENDIX B

Key Terms

C-Weighted Day-Night Average Sound Level (CDNL). CDNL is a DNL computed for impulsive noise such as sonic booms and large-caliber/explosive noise events. The frequency range is shifted to emphasize low-frequency sounds.

Day-Night Average Sound Level (DNL). DNL is a composite noise metric accounting for the sound energy of all noise events in a 24-hour period. In order to account for increased human sensitivity to noise at night, DNL includes a 10-dB adjustment to events occurring during the acoustical nighttime period (10 p.m. through 7 a.m.). See Section 4.3 for additional information.

Decibel (dB). dB is the unit used to measure the intensity of a sound.

Flight Profiles. Flight profiles consist of aircraft conditions (i.e., altitude, speed, power setting, etc.) defined at various locations along each assigned flight track.

Flight Track. The flight track locations represent the various types of arrivals, departures, and patterns accomplished at air installations. The location for each track is representative for the specific track and may vary due to air traffic control instructions, weather, and other reasons (e.g., one pilot may fly on one side of the depicted track, while another pilot may fly slightly to the other side of the track). Flight tracks are depicted as narrow lines on a map, but they are actually wider bands in practice.

Operation. An aircraft operation is defined as one takeoff or one landing. A complete closed pattern or circuit is counted as two operations because it has a takeoff component and a landing component. A sortie is a single military aircraft flight from the initial takeoff through the termination landing. The minimum number of aircraft operations for one sortie is two operations, one takeoff (departure) and one landing (approach).

Peak Sound Level Exceeded 15 Percent of the Time (PK15). PK15 is the peak sound level, factoring in the statistical variations caused by weather, that is likely to be exceeded only 15 percent of the time (i.e., 85 percent certainty that the sound will be within this range). It allows assessment of noise from large-caliber weapons and impulsive demolition activities, as well as from small-arms ranges.

U.S. AIR FORCE

PREPARED FOR

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