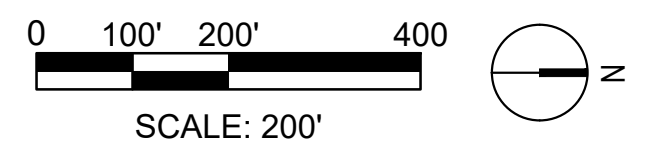
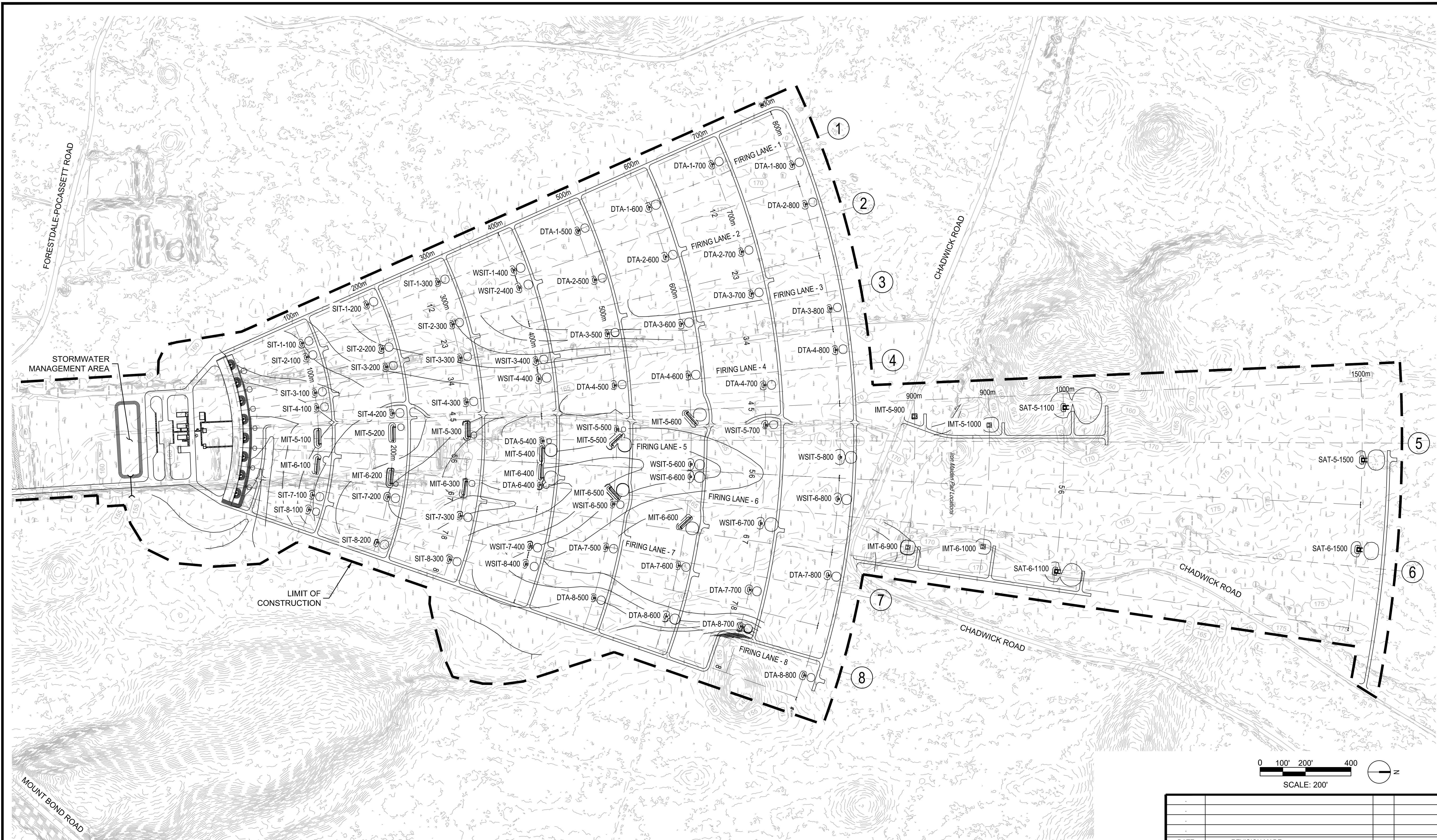


Appendix C: MPMG Range Design Plans

- Overall Site Plan (1500M) Sheet SP201 dated 19 July 2019
- Surface Danger Zone Plan (1500M) Sheet C-402 dated 19 July 2019
- Overall Existing Conditions Plan (1500M) Sheet V-200 dated 26 March 2019
- Overall Site Plan Sheet C-003 16 September 2019
- Surface Danger Zone Plan Sheet C-401 dated 16 September 2019

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DATE	REVISION MADE	BY	AUTHORIZED

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)

OVERALL SITE PLAN (1500M)

DATE: 07/19/2019	DES BY: HAB	BAKER PROJECT NUMBER: 170789	SHEET NO.: SP201
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FILE: SP201.DWG			



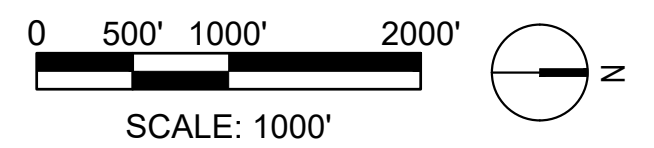
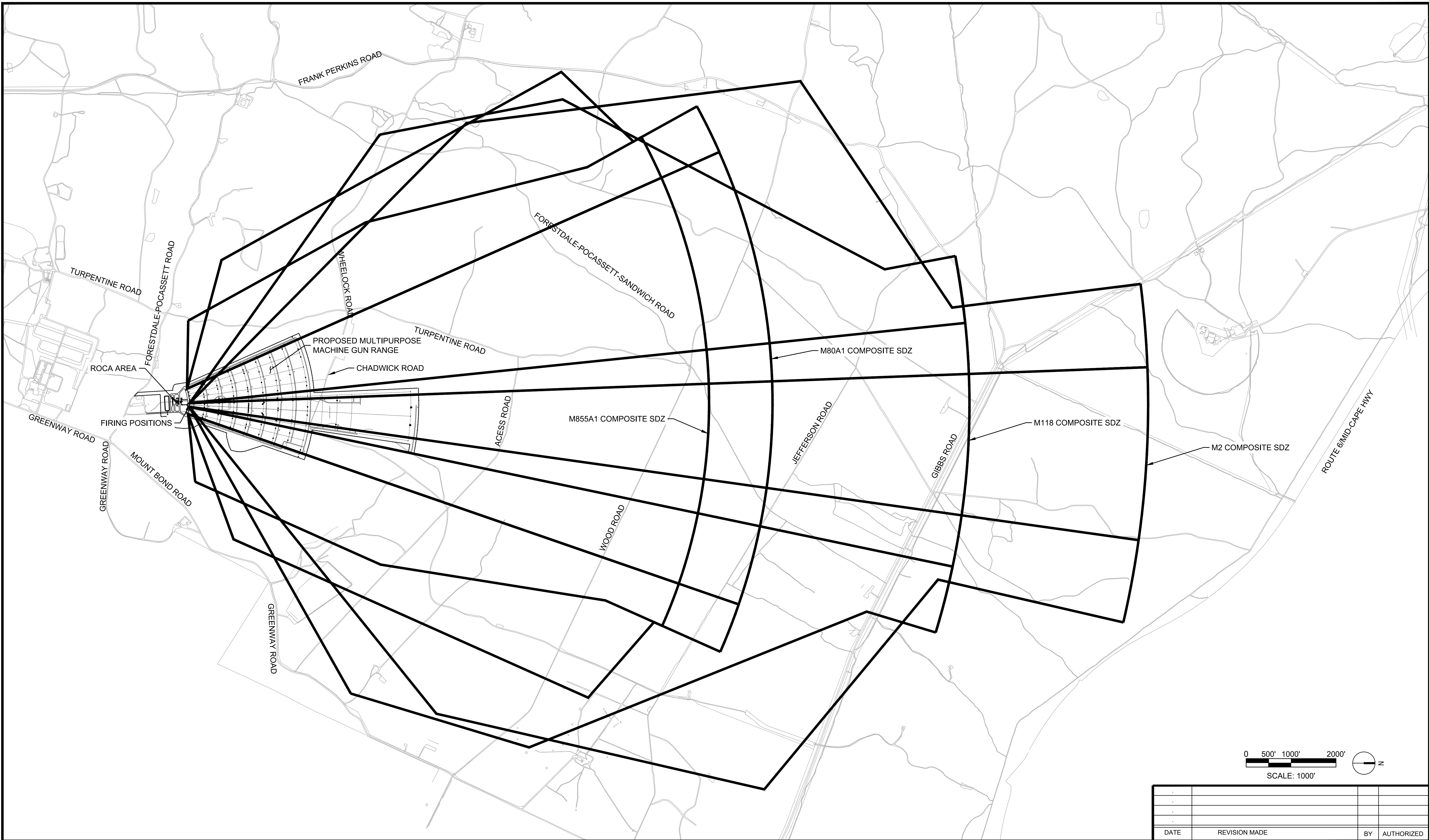
MICHAEL BAKER INTERNATIONAL
125 CAMBRIDGE PARK DRIVE, SUITE 502
CAMBRIDGE, MASSACHUSETTS 02140

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)
CAMP EDWARDS JOINT BASE CAPE COD
BOURNE, MASSACHUSETTS



TYPE A: ADDENDUM 07-22-2019

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DATE	REVISION MADE	BY	AUTHORIZED

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)			
SURFACE DANGER ZONE PLAN (1500M)			
DATE: 07/19/2019	DES BY: HAB	BAKER PROJECT NUMBER 170789	SHEET NO. C-402
SCALE: AS NOTED	DWN BY: HAB	GOV. PROJECT NUMBER 250194FY19	66 OF 74
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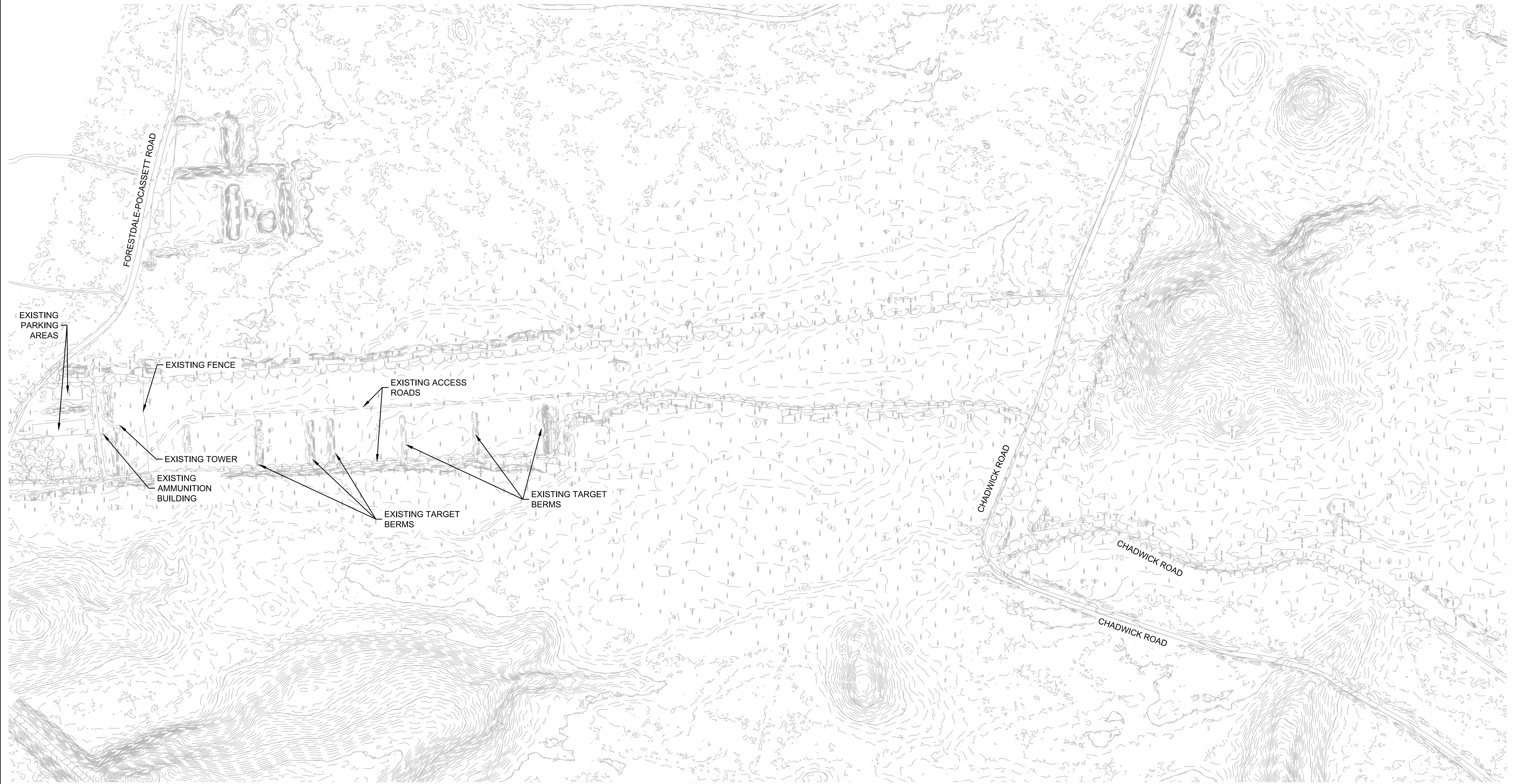
MICHAEL BAKER INTERNATIONAL
125 CAMBRIDGE PARK DRIVE, SUITE 502
CAMBRIDGE, MASSACHUSETTS 02140

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)
CAMP EDWARDS JOINT BASE CAPE COD
BOURNE, MASSACHUSETTS



TYPE 'A' ADDENDUM 07-22-2019

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DATE	REVISION MADE	BY	AUTHORIZED

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)			
OVERALL EXISTING CONDITIONS PLAN (1500M)			
DATE: 03-26-2019	DES BY: HAB	BAKER PROJECT NUMBER 170789	SHEET NO. V-200
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FILE: V-200.DWG			



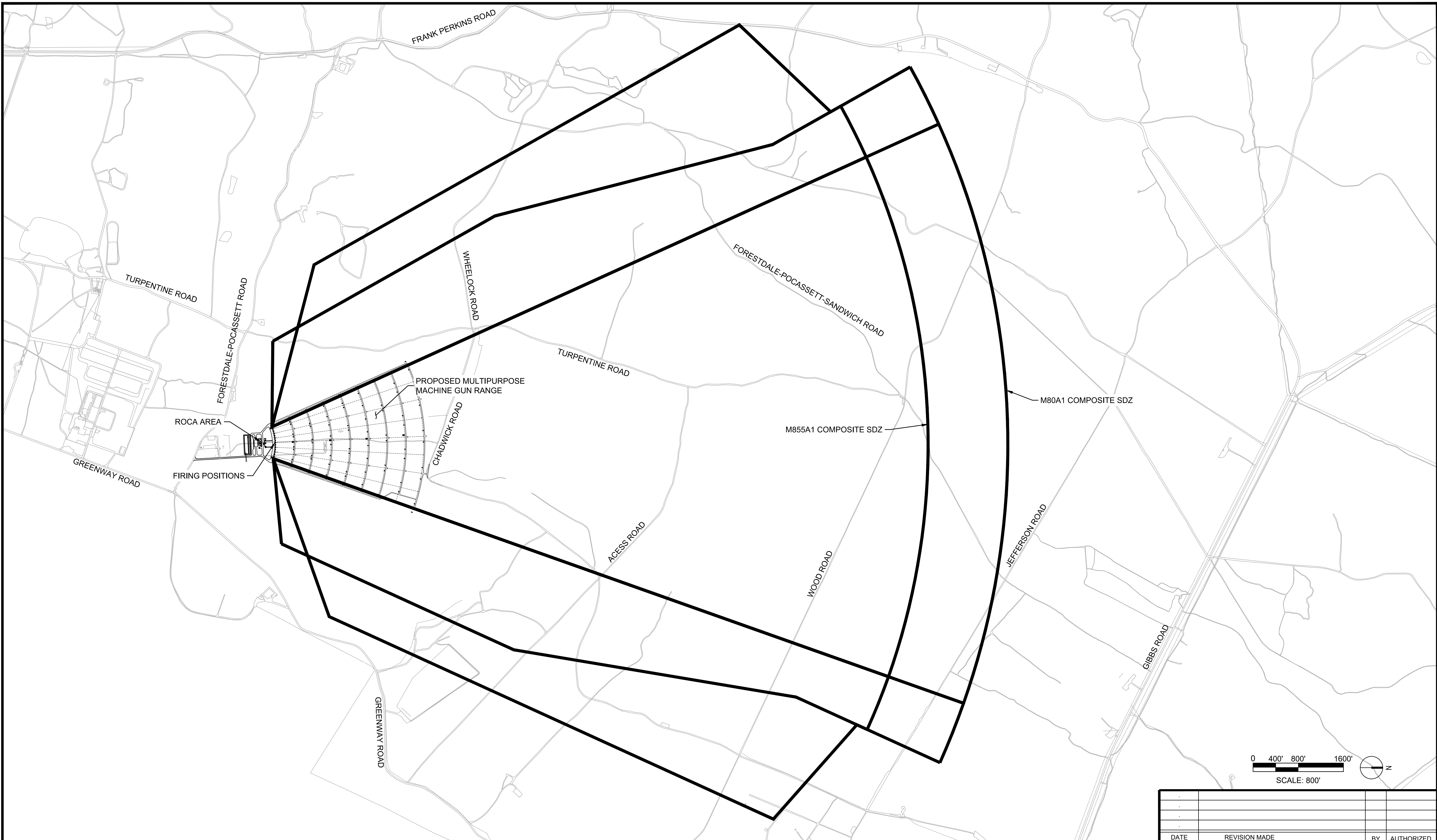
MICHAEL BAKER INTERNATIONAL
125 CAMBRIDGE PARK DRIVE, SUITE 502
CAMBRIDGE, MASSACHUSETTS 02140

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)
CAMP EDWARDS JOINT BASE CAPE COD
BOURNE, MASSACHUSETTS



SCHEMATIC DESIGN 03-26-2019

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DATE	REVISION MADE	BY	AUTHORIZED

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)			
SURFACE DANGER ZONE PLAN			
DATE: 9/16/19	DES BY: HAB	BAKER PROJECT NUMBER: 170789	SHEET NO.: C-401
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FILE: C-401.DWG			



MICHAEL BAKER INTERNATIONAL
 125 CAMBRIDGE PARK DRIVE, SUITE 502
 CAMBRIDGE, MASSACHUSETTS 02140

AUTOMATED MULTIPURPOSE MACHINE GUN RANGE (MPMG)
 CAMP EDWARDS JOINT BASE CAPE COD
 BOURNE, MASSACHUSETTS



65% DESIGN

Appendix D: Noise Impact Report

- United States Army Public Health Center (USAPHC) Noise Assessment for the Proposed MPMG Range Camp Edwards, Massachusetts dated 1 May 2019



DEPARTMENT OF THE ARMY
US ARMY PUBLIC HEALTH CENTER
BUILDING 5158
8252 BLACKHAWK ROAD
ABERDEEN PROVING GROUND MARYLAND 21010-5403

MCHB-PH-WMG

23 July 2019

MEMORANDUM FOR Camp Edwards Headquarters (NGMA/Mr. Matthew D. McKay),
1203 West Inner Road, Camp Edwards, MA 02542

SUBJECT: Environmental Health Sciences, Environmental Noise Consultation
No. S.0064236b-19, Noise Assessment for Proposed Multi-Purpose Machine Gun
Range, Camp Edwards, Massachusetts, 1 May 2019

1. Subject document is enclosed.
2. The U.S. Army Public Health Center (APHC) strives to provide high quality products and services in a timely manner. We would appreciate a few moments of your time to tell us how we did. Please visit the following link:
<https://usaphcapps.amedd.army.mil/Survey/se.ashx?s=25113745052C38DC>. To help ensure we evaluate the proper project:
 - a. For Question 1 "Directorate/Division" please indicate:
 - (1) Directorate: Environmental Health Sciences and Engineering
 - (2) Division: Environmental Health Sciences
 - b. For Question 2 "Type of product or service received," please indicate:
Technical or Surveillance Report
3. Our points of contact for this consultation are Ms. Kristy Broska, Environmental Protection Specialist or Ms. Catherine Stewart, Branch Chief, Environmental Noise, APHC, commercial 410-436-3829 or DSN 584-3829, or e-mail:
kristy.a.broska.civ@mail.mil or catherine.m.stewart20.civ@mail.mil.

FOR THE DIRECTOR:

Encl

ALICK E. SMITH
LTC, MS
Director, Environmental Health Sciences
and Engineering



U.S. ARMY PUBLIC HEALTH CENTER

8252 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010-5403

**Environmental Health Sciences, Environmental Noise Consultation
No. S.0064236b-19, July 2019
Environmental Health Sciences and Engineering**

**Noise Assessment for Proposed Multi-Purpose Machine Gun Range,
Camp Edwards, Massachusetts, 1 May 2019**

Prepared by Ms. Kristy Broska, Environmental Noise Branch

Distribution authorized to U.S. Government Agencies only; protection of privileged information evaluating another command: July 2019. Requests for this document must be referred to Camp Edwards Headquarters (NGMA), 1203 West Inner Road, Camp Edwards, MA 02542.

General Medical: 500A, Public Health Surveys

**EXECUTIVE SUMMARY
ENVIRONMENTAL HEALTH SCIENCES
ENVIRONMENTAL NOISE CONSULTATION
NO. S.0064236b-19
NOISE ASSESSMENT FOR
PROPOSED MULTI-PURPOSE MACHINE GUN RANGE
CAMP EDWARDS, MASSACHUSETTS
1 MAY 2019**

1. PURPOSE

The U.S. Army Public Health Center completed this consultation to provide the Massachusetts Army National Guard an updated noise assessment for the proposed Multi-Purpose Machine Gun (MPMG) range at Camp Edwards. In this consultation, the proposed MPMG is analyzed based on two alternative locations for the firing line and use of .50 caliber rounds.

2. CONCLUSIONS

2.1 Existing Activity

For existing small caliber ranges, Zone III remains within the boundary. Zone II extends slightly beyond the eastern boundary and encompasses multiple residential properties.

2.2 Proposed Activity: 7.62mm Rounds

The location of the proposed MPMG firing line has minimal impact on the overall size of the Noise Zones. Zone III remains within the boundary. Zone II extends beyond the eastern boundary, less than a half mile, encompassing multiple residential properties.

2.3 Proposed Activity: .50 Caliber Rounds

Zone III remains within the boundary for both alternative locations. Zone II extends less than a mile beyond the eastern boundary and encompasses multiple residences and an elementary school.

3. RECOMMENDATIONS

Include the information from this consultation in the environmental analysis documentation for the proposed action.

Continue to provide public notification of upcoming training events, particularly the .50 caliber activity.

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**ENVIRONMENTAL HEALTH SCIENCES
ENVIRONMENTAL NOISE CONSULTATION
NO. S.0064236b-19
NOISE ASSESSMENT FOR
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1 MAY 2019**

1. PURPOSE

The U.S. Army Public Health Center completed this consultation to provide the Massachusetts Army National Guard an updated noise assessment for the proposed Multi-Purpose Machine Gun (MPMG) range at Camp Edwards.

2. REFERENCES AND TERMS

Appendix A contains a list of references used to prepare this consultation. The glossary provides definitions for acronyms, abbreviations, and terms.

3. GENERAL

The proposed MPMG range would replace the inactive Known Distance Range. This proposed action was addressed in a previous noise assessment (U.S. Army Institute of Public Health, 2014). In this consultation, the proposed MPMG is analyzed based on two alternative locations for the firing line and the use of .50 caliber rounds. The 2014 assessment was based upon a maximum ammunition size of 7.62mm.

In this assessment the following identification names are used: Alternative 1 – “MPMG firing line based on the existing Know Distance firing line” and Alternative 2 – “MPMG firing line is 100 meters north of the existing Known Distance firing line.” The maximum caliber utilized in the analysis is included with the alternative number (i.e., Alternative 2 (.50 caliber)). Figure 1 illustrates the location of the proposed MPMG range.

4. NOISE ASSESSMENT GUIDELINES

Noise Zones are defined in Army Regulation (AR) 200-1. Per AR 200-1, noise-sensitive land uses, such as housing, schools, and medical facilities are acceptable within the Land Use Planning Zone (LUPZ) and Noise Zone I, normally not recommended in Noise Zone II, and not compatible in Noise Zone III (Department of the Army, 2007). Table 1 lists the land use planning guidelines.

Use of trademarked name(s) does not imply endorsement by the U.S. Army but is intended only to assist in identification of a specific product.
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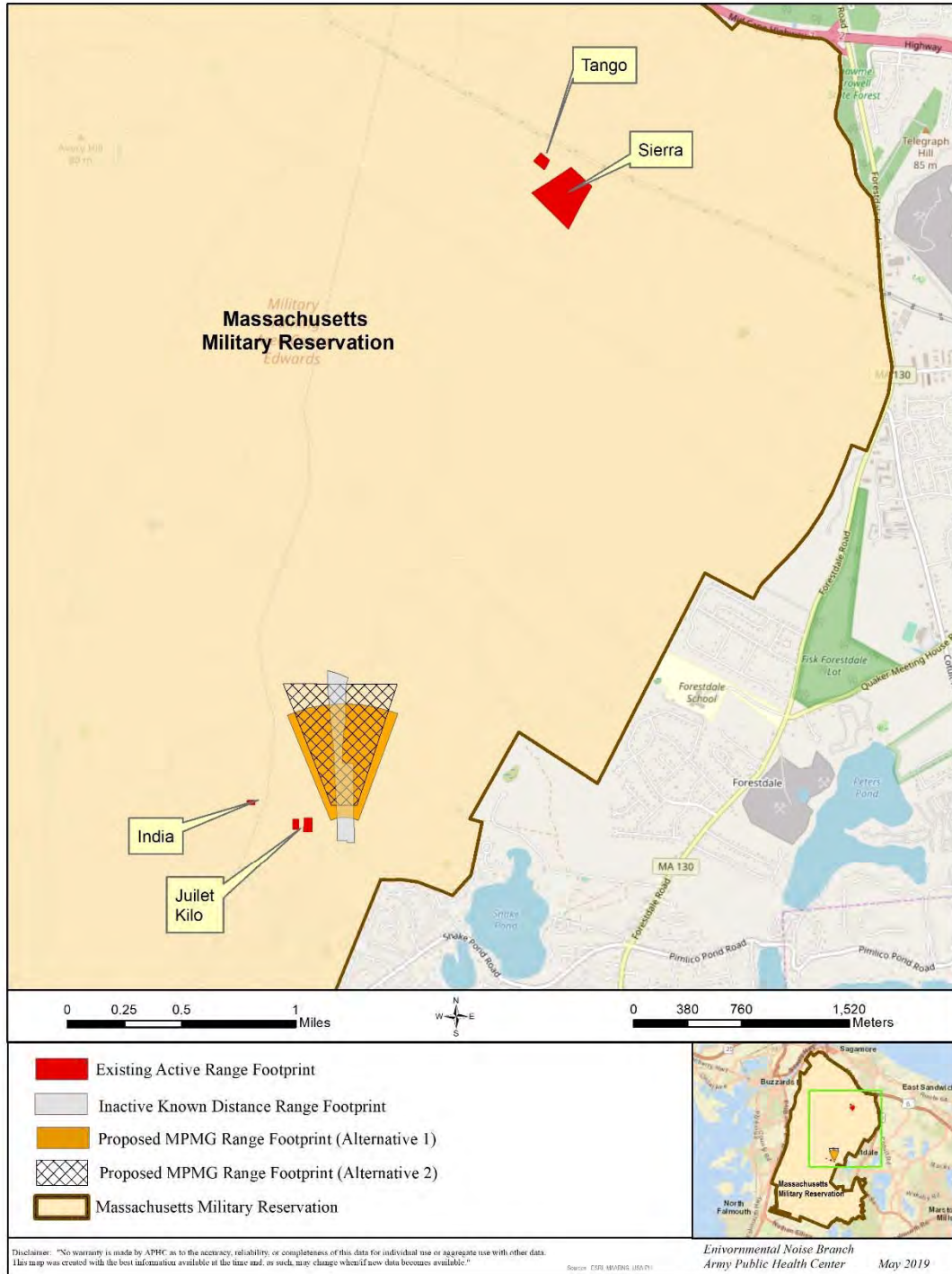


Figure 1. Proposed MPMG Location

Table 1. Land Use Planning Guidelines

Noise Zone	Noise Limits			Noise-Sensitive Land Use
	Aviation ADNL (dB)	Impulsive CDNL (dB)	Small Arms Peak (dB)	
LUPZ	60 – 65	57 – 62	n/a	Generally Compatible
I	< 65	< 62	< 87	Generally Compatible
II	65 – 75	62 – 70	87 – 104	Generally Not Compatible
III	> 75	> 70	> 104	Not Compatible

Legend:

dB = decibel

ADNL = A-weighted Day-Night average sound Level

CDNL = C-weighted Day-Night average sound Level

LUPZ = Land Use Planning Zone

Note:

Source: AR 200-1

5. NOISE CONTOURING PROCEDURES

The Small Arms Range Noise Assessment Model (SARNAM) is the standard U.S. Army small caliber weapons (.50 caliber and below) noise simulation program (U.S. Army Corp of Engineers, 2003). The program requires operations data concerning types of weapons, quantity of ammunition, and range layout. The SARNAM calculation algorithms assume weather conditions or wind direction that favors sound propagation in all directions.

Table 2 lists the ammunition types used to develop the Noise Zones.

Table 2. Baseline Activity Small Caliber Noise Zone Inputs

RANGE FACILITY	AMMUNITION UTILIZED
India	5.56mm
Juliet	9mm
	.40 caliber
	5.56mm
	7.62mm
Kilo	9mm
	5.56mm
Sierra	5.56mm
Tango	5.56mm

Legend:

mm = millimeter

6. NOISE ASSESSMENT

6.1 Baseline Condition

Figure 2 illustrates the Noise Zones for the existing active small caliber ranges. Zone III (> 104 dB Peak) does not extend beyond the boundary. Zone II (87–104 dB Peak) extends approximately 150 meters beyond the boundary encompassing a small residential area west of Snake Pond.

6.2 Proposed Action

For reference, Alternative 1 refers to the proposed MPMG firing line being located on the existing Know Distance firing line and Alternative 2 is based on the proposed MPMG firing line being located 100 meters north of the existing Known Distance firing line. For both alternatives, the .50 caliber rounds would fire approximately 30 days per year, using the two center lanes of the MPMG.

6.2.1 Alternative 1 (7.62mm)

Figure 3 illustrates the Noise Zones for the existing active ranges and the proposed MPMG range using 7.62mm rounds. Zone III does not extend beyond the boundary. Zone II extends up to 650 meters beyond the boundary. The expanded Zone II would encompass additional residential properties northeast of Snake Pond.

6.2.2 Alternative 2 (7.62mm)

Figure 4 illustrates the Noise Zones for the existing active ranges and the proposed MPMG range using 7.62mm rounds. Zone III does not extend beyond the boundary. Zone II extends up to 550 meters beyond the boundary. The expanded Zone II would encompass additional residential properties northeast of Snake Pond.

6.2.3 Alternative 1 (.50 Caliber)

Figure 5 illustrates the Noise Zones for the existing active ranges and the proposed MPMG range using .50 caliber rounds. Zone III does not extend beyond the boundary. Zone II extends, up to 1,400 meters, beyond the boundary to Route 130. The expanded Zone II would encompass multiple residential neighborhoods and an elementary school.

6.2.4 Alternative 2 (.50 Caliber)

Figure 6 illustrates the Noise Zones for the existing active ranges and the proposed MPMG range using .50 caliber rounds. Zone III does not extend beyond the boundary. Zone II extends, up to 1,300 meters, beyond the boundary to Route 130. The expanded Zone II would encompass multiple residential neighborhoods and an elementary school.

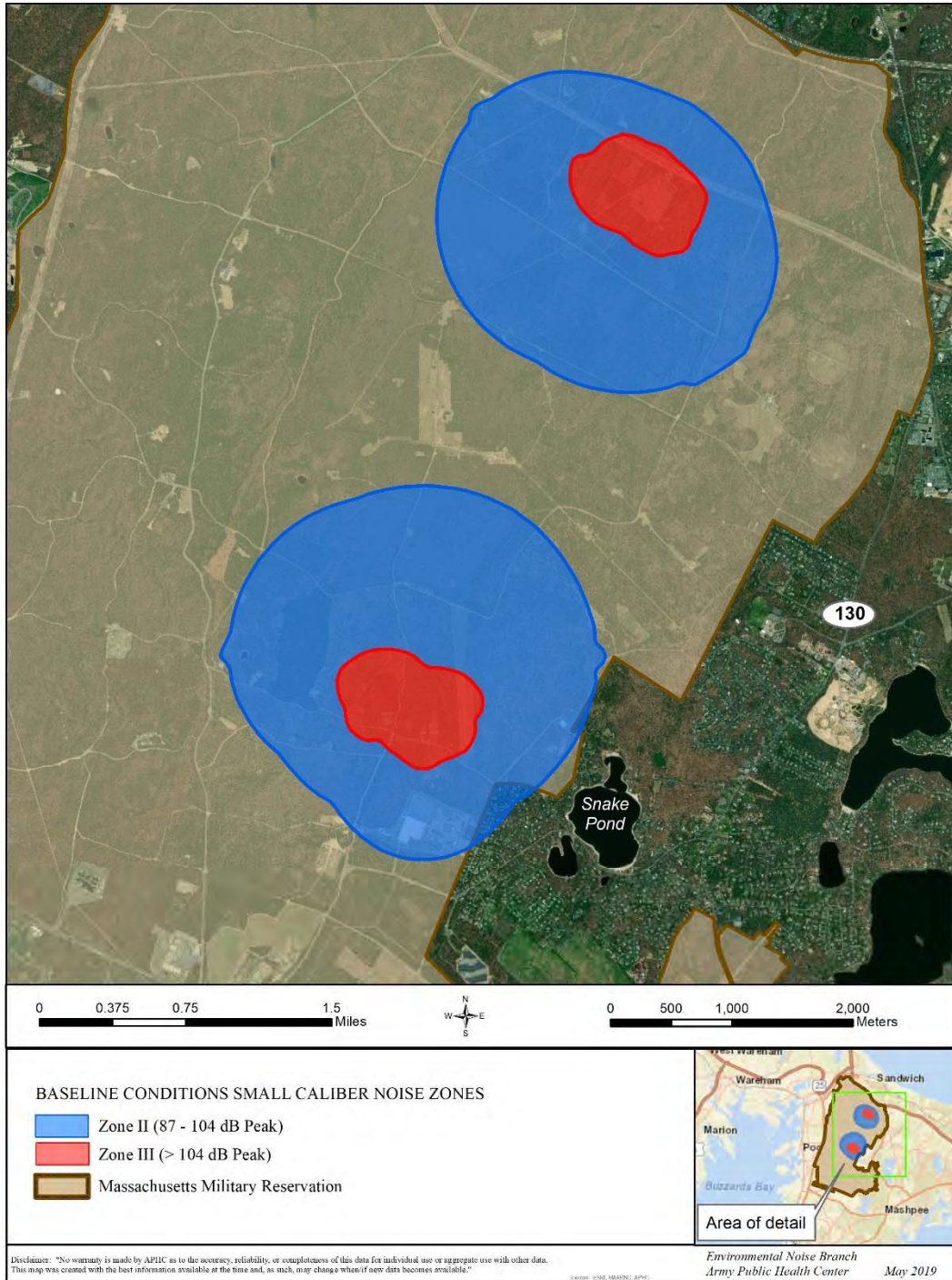


Figure 2. Camp Edward Existing Small Caliber Noise Zones

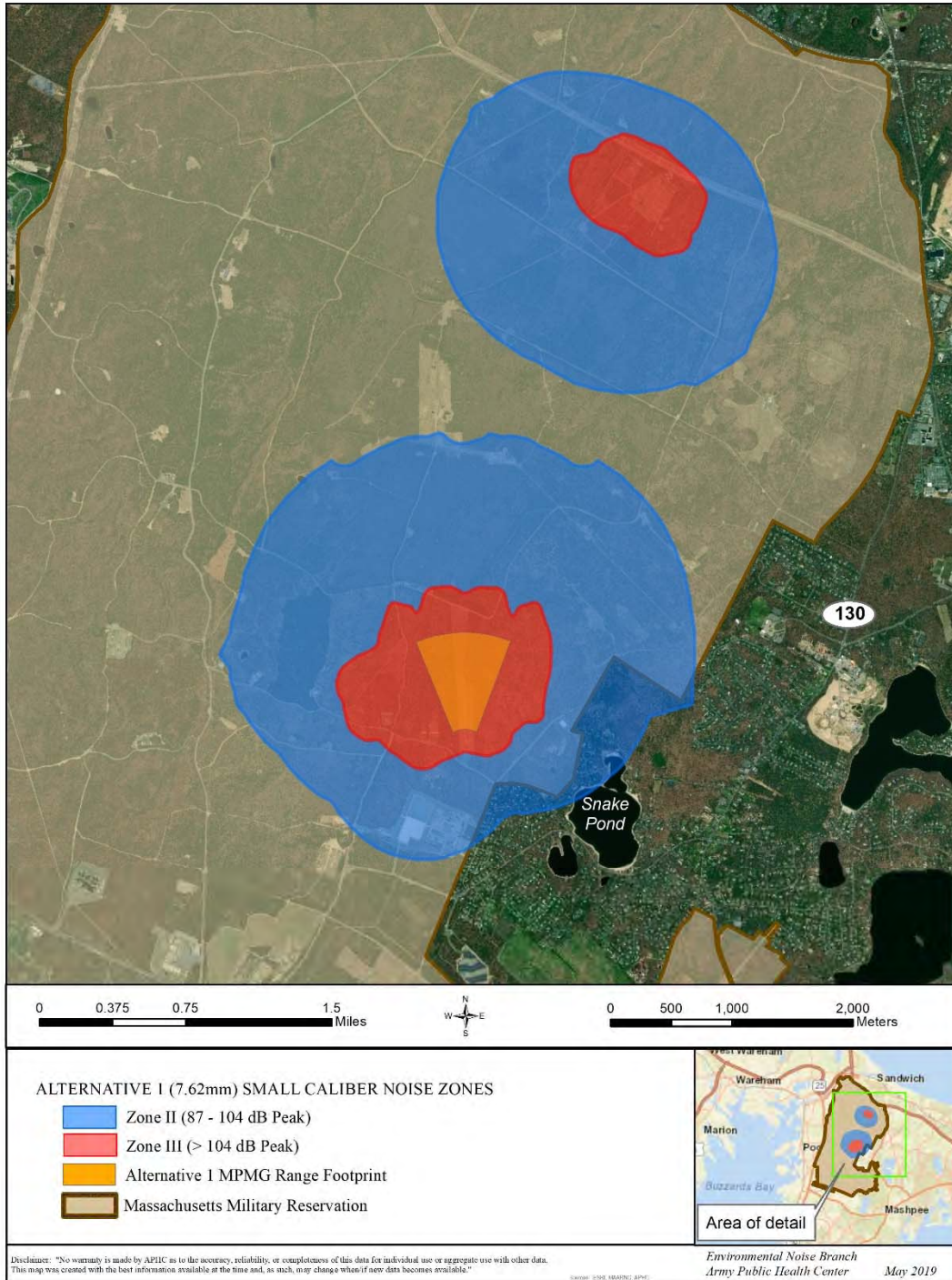


Figure 3. Alternative 1 (7.62mm) Projected Small Caliber Noise Zones

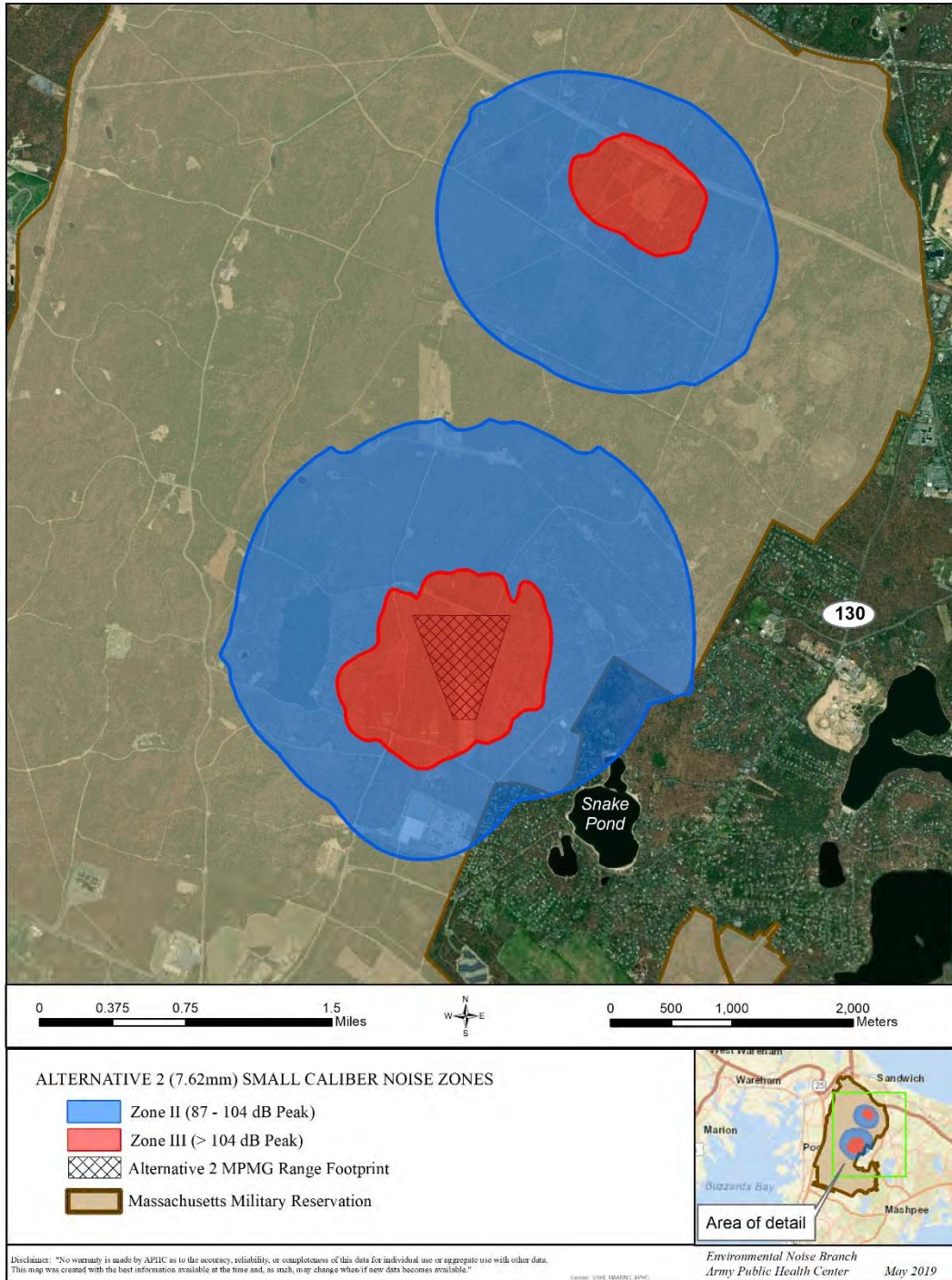


Figure 4. Alternative 2 (7.62mm) Projected Small Caliber Noise Zones

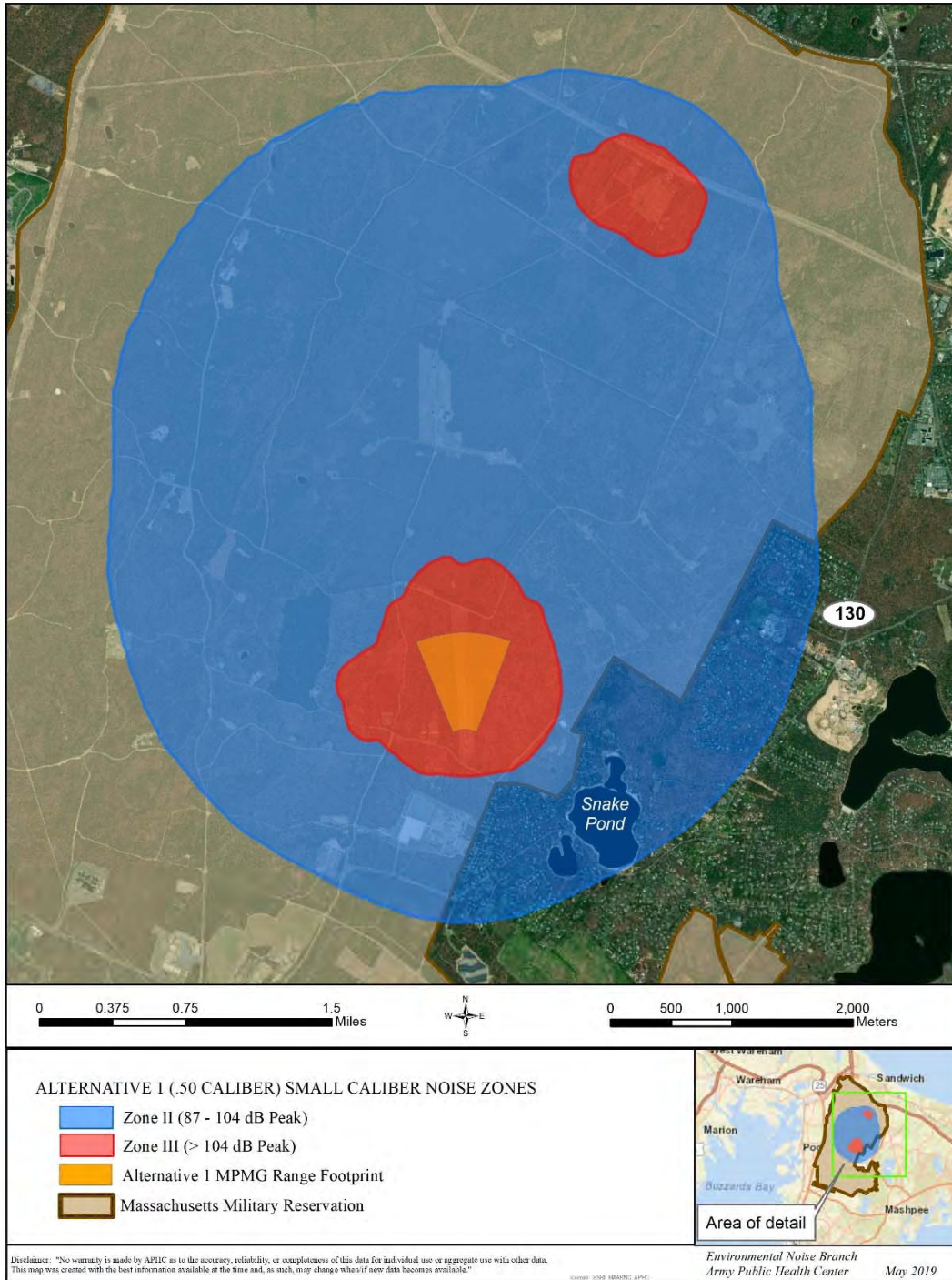


Figure 5. Alternative 1 (.50 Caliber) Projected Small Caliber Noise Zones

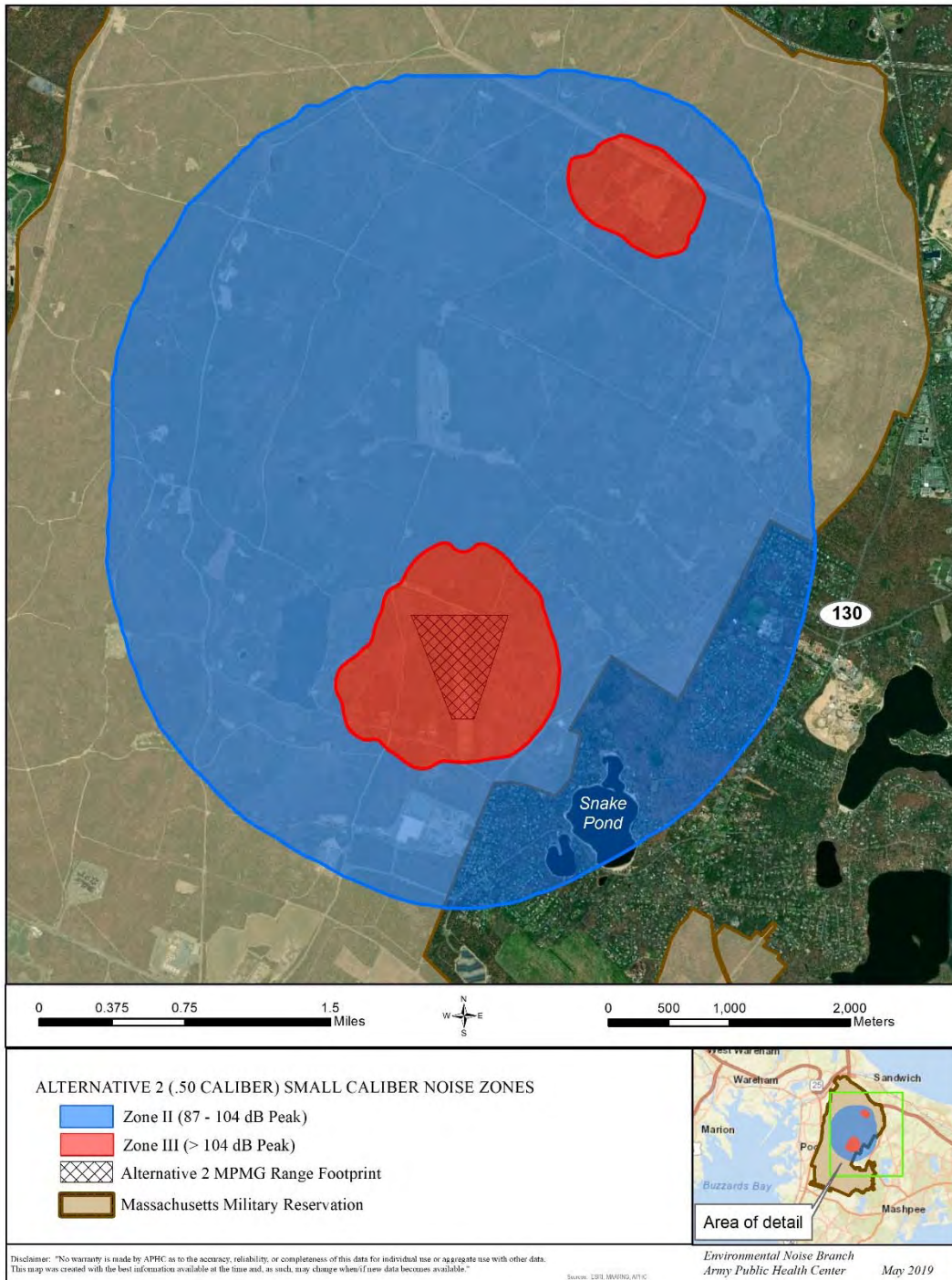


Figure 6. Alternative 2 (.50 Caliber) Projected Small Caliber Noise Zones

6.3 Details of Off Base Noise Zones

Figures 7 through 11 provide a detailed view of the small arms Noise Zones in the Forestdale community. Tables 3 through 5 list the total acreage and off base acreage for each Noise Zone based upon each scenario.

Table 3. Existing Activity Small Caliber Noise Zones Acreage

Noise Zone	Total Acreage	Off Base Acreage
Zone II (87–104 dB Peak)	2,754	26
Zone III (> 104 dB Peak)	394	0

Legend:
dB = decibels

Table 4. Small Caliber Noise Zones Acreage for MPMG with 7.62mm Rounds

Noise Zone	Alternative 1 Location		Alternative 2 Location	
	Total Acreage	Off Base Acreage	Total Acreage	Off Base Acreage
Zone II (87–104 dB Peak)	3,257	166	3,293	127
Zone III (> 104 dB Peak)	667	0	693	0

Legend:
dB = decibels

Table 5. Small Caliber Noise Zones Acreage for MPMG with .50 Caliber Rounds

Noise Zone	Alternative 1 Location		Alternative 2 Location	
	Total Acreage	Off Base Acreage	Total Acreage	Off Base Acreage
Zone II (87–104 dB Peak)	7,395	921	7,323	832
Zone III (> 104 dB Peak)	788	0	802	0

Legend:
dB = decibels

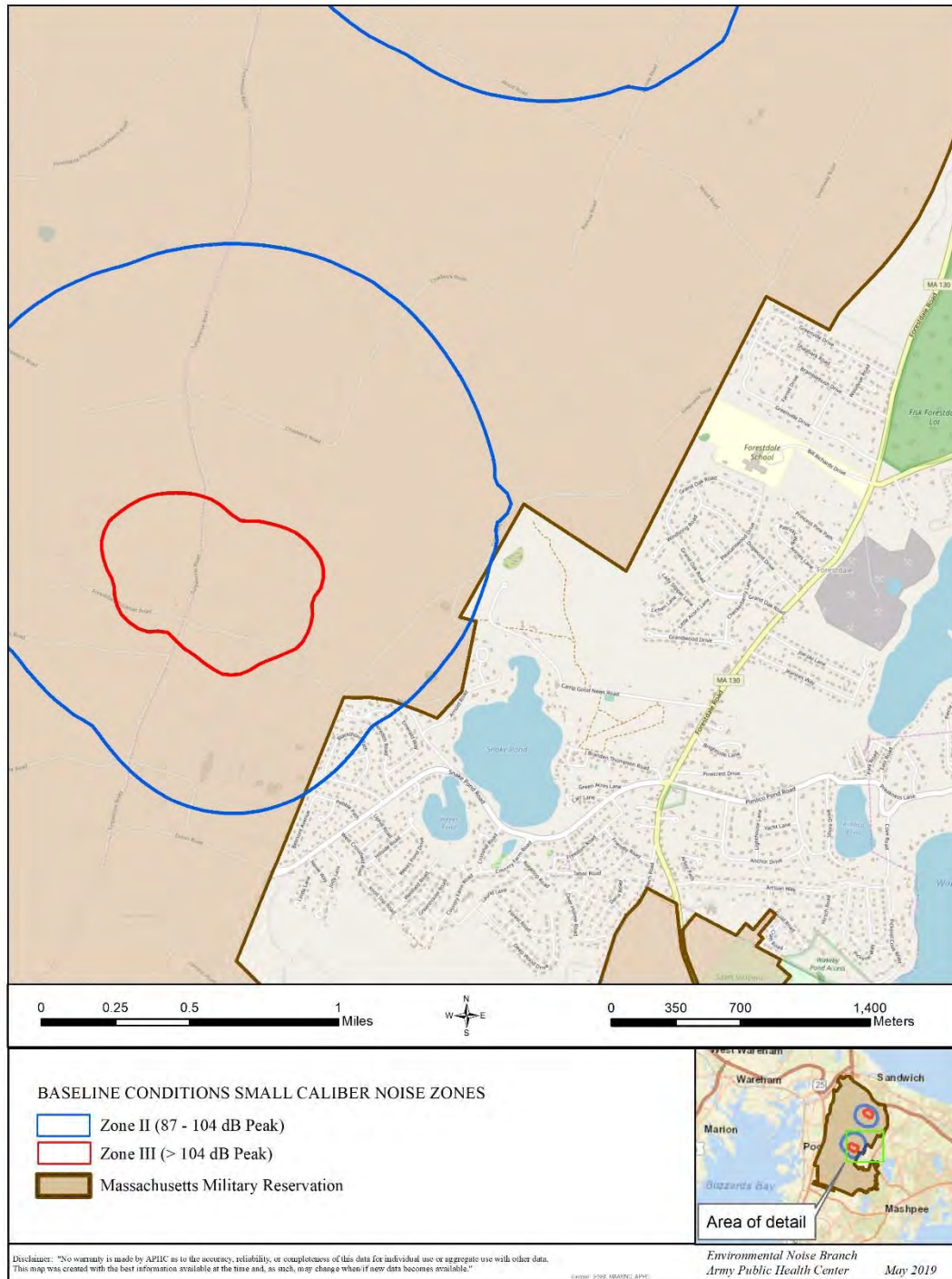


Figure 7. Detailed View Existing Small Caliber Noise Zones

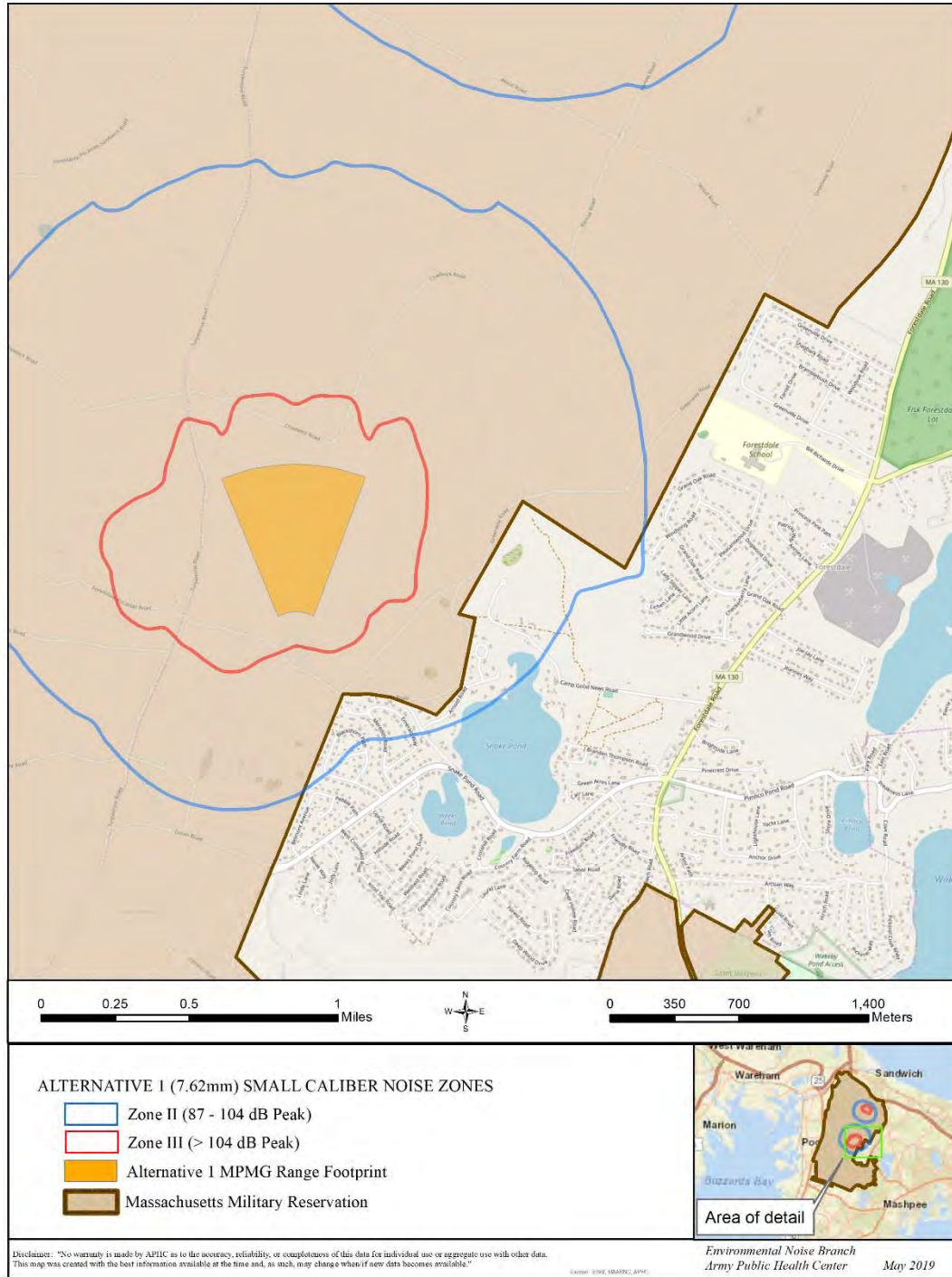


Figure 8. Detailed View Alternative 1 (7.62mm) Projected Small Caliber Noise Zones

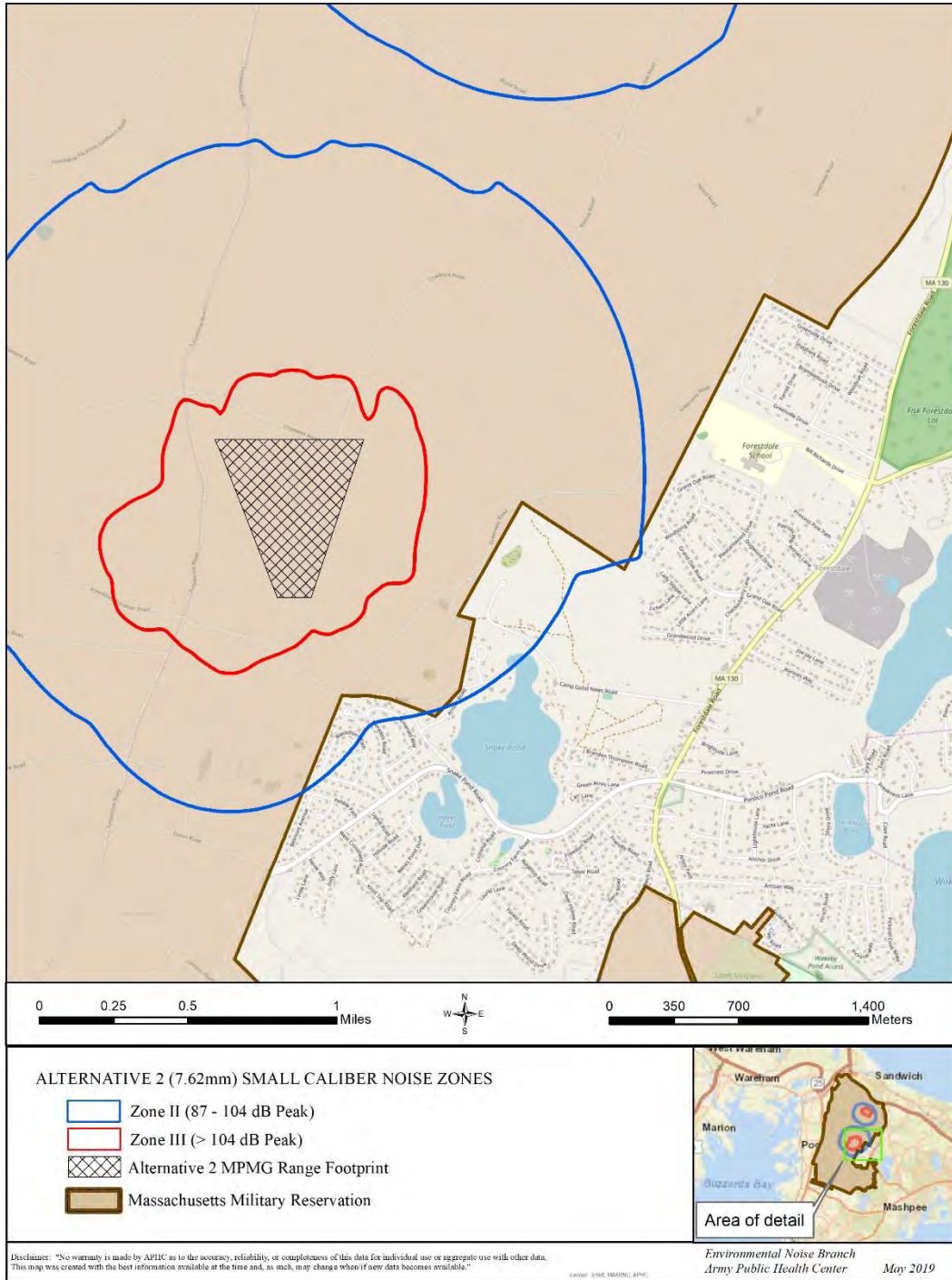


Figure 9. Detailed View Alternative 2 (7.62mm) Projected Small Caliber Noise Zones

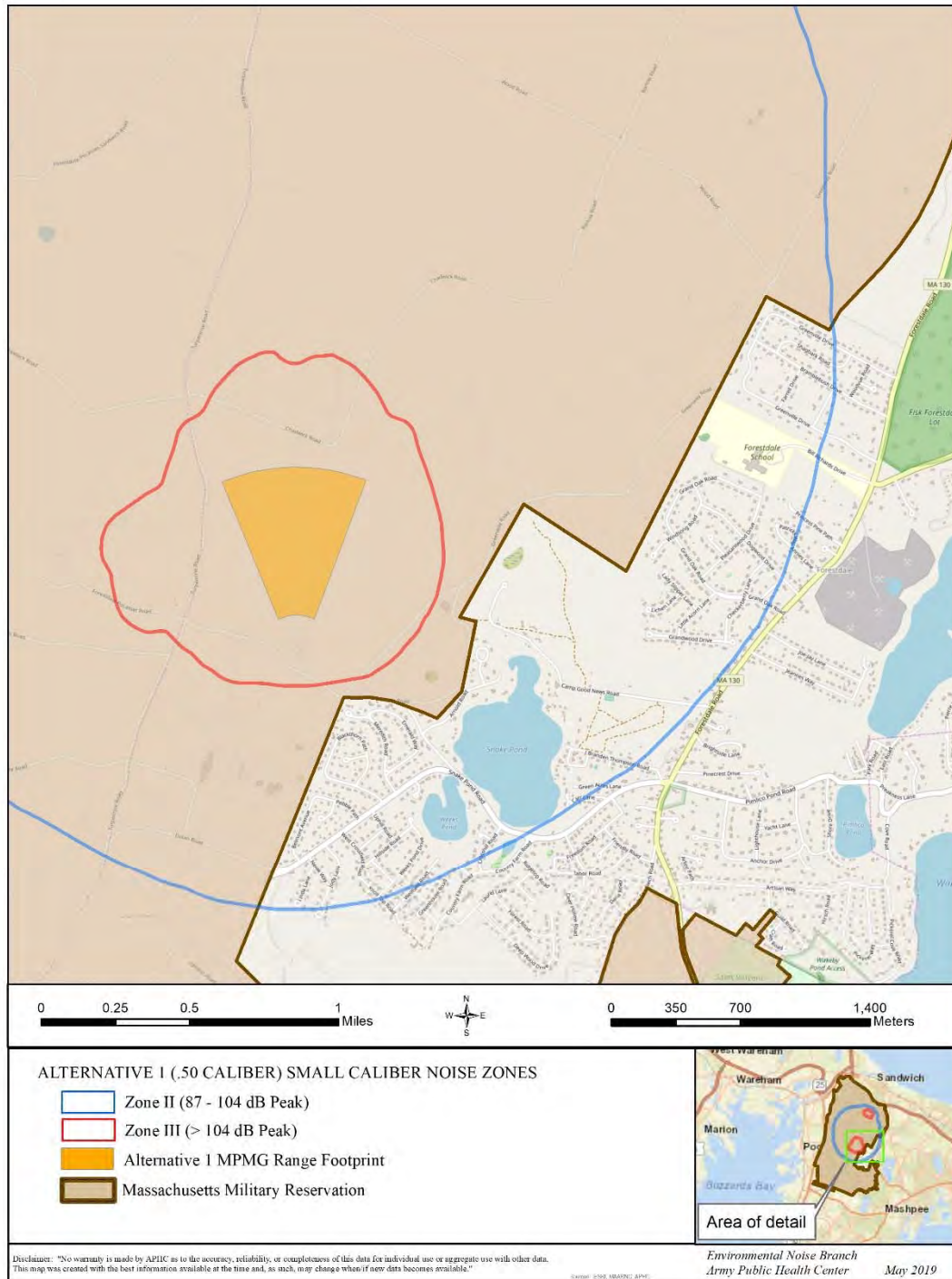


Figure 10. Detailed View Alternative 1 (.50 Caliber) Projected Small Caliber Noise Zones

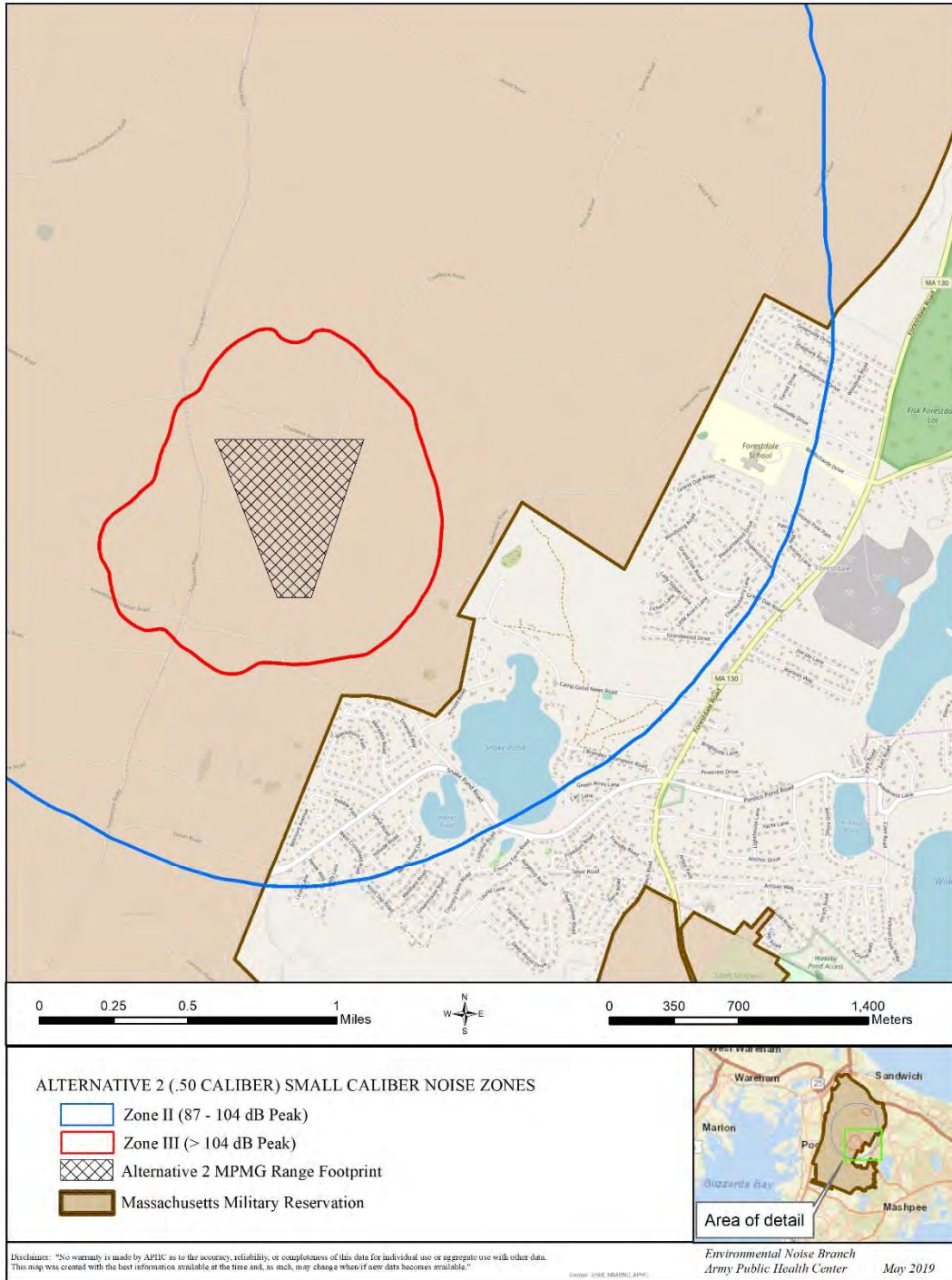


Figure 11. Detailed View Alternative 2 (.50 Caliber) Projected Small Caliber Noise Zones

7. FINDINGS

For the existing small caliber range activities, Zone III remains within the boundary. Zone II extends slightly beyond the eastern boundary encompassing a small residential area west of Snake Pond.

With the 7.62mm rounds, both alternative locations of the proposed range generates a Zone II that extends beyond the eastern boundary encompassing multiple residential properties. Alternative 1 would increase the off base Zone II area from 26 to 166 acres and Alternative 2 would increase to 127 acres. Zone III remains within the boundary.

With the .50 caliber rounds, both alternative locations of the proposed range generate a Zone II that extends less than a mile beyond the eastern boundary. Within this area there multiple residential neighborhoods and an elementary school. Alternative 1 would increase the off base Zone II area from 26 to 921 acres and Alternative 2 would increase to 832 acres. Zone III remains within the boundary.

8. RECOMMENDATIONS

Include the information from this consultation in the environmental analysis documentation for the proposed actions.

Continue to provide public notification of upcoming training events, particularly the .50 caliber activity.

KRISTY BROSKA
Environmental Protection Specialist

APPROVED:

CATHERINE STEWART
Branch Chief
Environmental Noise

Environmental Health Sciences, Environmental Noise Consultation No. S.0064236b-19,
1 May 2019

APPENDIX A

REFERENCES

Department of the Army. 2007. Army Regulation 200-1, Environmental Protection and Enhancement, Chapter 14, Operational Noise.

U.S. Army Construction Engineering Research Laboratories. 2003. SARNAM Computer Model, Version 2.6.2003-06-06.

U.S. Army Institute of Public Health. 2014. Environmental Noise Consultation No. WS.0030762b-15, Operational Noise Assessment for Proposed Multi-Purpose Machine Gun Range, Camp Edwards, Massachusetts, 27 October 2014. Aberdeen Proving Ground, Maryland.

GLOSSARY

Acronyms/Abbreviations

AR

Army Regulation

dB

Decibels

mm

millimeter

MPMG

Multi-Purpose Machine Gun

SARNAM

Small Arms Range Noise Assessment Model

Terms

Decibels (dB)

A logarithmic sound pressure unit of measure.

Noise

Any sound without value.

Noise Zone III

The area around a noise source in which the Peak level is greater than 104 dB for small caliber weapons.

Noise Zone II

The area around a noise source in which the Peak level is 87–104 dB for small caliber weapons.

Noise Zone I

Includes all areas around a noise source in which the Peak level is less than 87 dB for small caliber weapons. This area is usually suited for all types of land use activities.

Peak

Peak is a single-event sound level without weighting.