FINDING OF NO SIGNIFICANT IMPACT:
Construction and Operation of two ranges: an Infantry Platoon Battle Course (Range 127) and an Infantry Squad Battle Course (Range 153)

Fort Carson has prepared an Environmental Assessment (EA) that evaluates the potential environmental impacts of the Army's proposal to construct and operate a standard live-fire Infantry Platoon Battle Course (IPBC) (Range 127) and an Infantry Squad Battle Course (ISBC) (Range 153), on Fort Carson, Colorado to conduct its military mission to meet evolving Army training standards. The Ranges would provide realistic scenario-based live fire range facilities for Infantry Platoon and Squad-level training and assessment opportunities, either mounted or dismounted, to develop and improve Soldier and team proficiency and competence in the use of sophisticated weaponry at Fort Carson.

Description of the Proposed Action

Fort Carson is proposing to construct and operate an IPBC complex to support the infantry platoon live-fire collective training at Fort Carson. The standard IPBC includes the range, targetry, and a range operations control area (ROCA). The Proposed Action also includes the construction and operation of an ISBC at an existing range (Range 153). The ISBC would not change the current footprint of the ROCA, but would be an extension of Range 153.

Alternatives

Alternatives to construct and operate the IPBC and ISBC ranges on other sites on Fort Carson were evaluated and screened based on criteria to meet mission as well as cost requirements. Criteria included:

- minimization of effects on the other military missions at Fort Carson;
- minimization of significant environmental effects;
- minimization of safety, health, and nuisance issues, particularly with the general public; and
- securing a reliable and cost-effective source of power for ranges.

There were no other alternative sites that met all the above siting criteria. Other environmental issues (vegetation effects, potential erosion) could be reduced with mitigation.

No Action Alternative

The No Action Alternative provides a basis of comparison for the Proposed Action and also addresses issues of concern by avoiding or minimizing effects associated with the Proposed Action. Under the No Action Alternative, Fort Carson would not construct or operate the IPBC or ISBC Ranges. This alternative provides a baseline for environmental conditions.

Environmental Consequences

Potential direct, indirect, and cumulative impacts of the Proposed Action and No Action Alternative were identified in the analysis and public comment process during the development and finalization of the EA. Implementation of the Proposed Action (*i.e.*, construct and operate the IPBC and ISBC) would have no significant negative environmental or socioeconomic effects. Satisfaction of the Army's significant need to provide up-to-date and realistic training at Fort Carson is considered to outweigh the relatively minor environmental impacts, and identified mitigation would occur before and after range construction. Findings indicate that implementation of the Proposed Action would result in no significant adverse environmental consequences. The environment would not be significantly or adversely affected by proceeding with the Proposed Action. No significant cumulative effects are expected.

Mitigation Measures

Fort Carson is committed to sustaining and preserving the range environment. In keeping with that commitment, the Installation has an active environmental management program that employs a full array of best management practices (BMPs) and environmental management programs to ensure environmental compliance, stewardship, and sustainability of those areas potentially impacted by this action. In this case, substantial mitigation has been incorporated into the design of the proposed courses and their supporting range infrastructure in order to achieve environmentally preferable outcomes. See the site specific design and implementation features detailed in sections 4.2.4 through 4.7.4 including where necessary rock-lined ditches, rock check dams, hardened crossings, landscaping and reseeding, shaded fuel breaks, with clear cuts and thinning as necessary to reduce fire danger.

Additionally, the existing environmental staff and programs represent a current and foreseeable resource for stewardship and for implementation of existing plans and best practices, including implementation of fugitive dust controls measures, the Stormwater Pollution Prevention Plan (SWPPP), the Operational Noise Plan, the Programmatic Agreements for historic preservation, a prescribed burning program, and wildlife surveys and management. Additionally, the Installation's land management and restoration staff represents an in-place and funded resource for implementation and monitoring of the effects of land use and the effectiveness of restoration programs. They are a monitoring and enforcement capability which is currently funded and for which continued funding will be sought and for which the anticipated necessary funding is expected to be available.

Conclusion

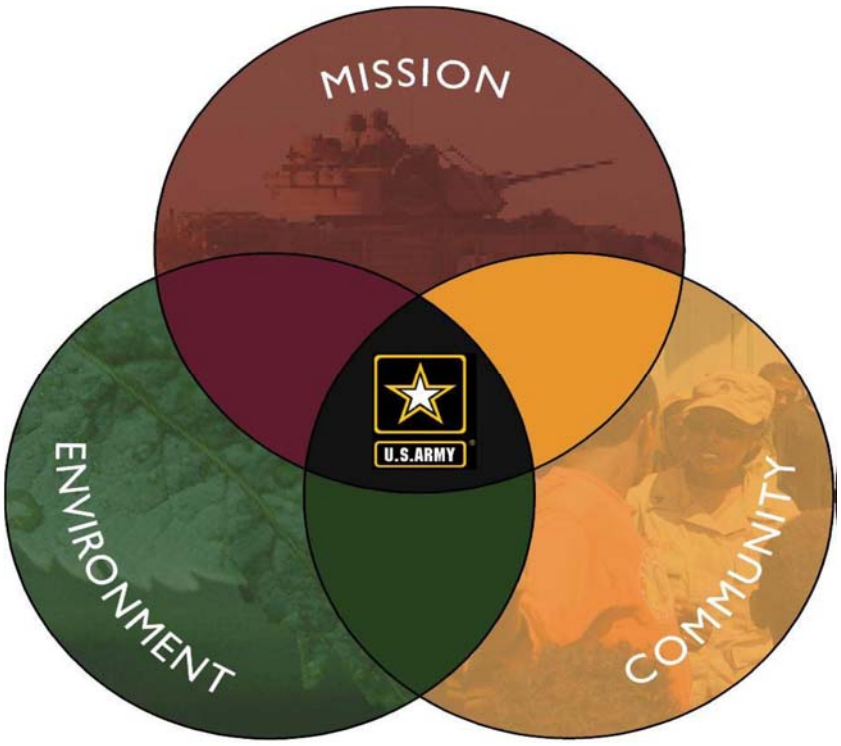
The attached EA was prepared pursuant to Title 32 of the Code of Federal Regulations (CFR) Part 651 and U.S. Council on Environmental Quality (CEQ) regulations (Title 40 of the CFR, Parts 1500-1508) for implementing the procedural requirements of the

National Environmental Policy Act (NEPA). The finding of this EA is that the Proposed Action, with minor mitigation, would have no significant direct, indirect or cumulative adverse effects on the human or natural environment. Therefore, based on review of the EA, I conclude that the Proposed Action, the Army's preferred alternative, is not a major federal action that would significantly affect the quality of the environment within the meaning of Section 102(2)(c) of NEPA. Accordingly, no Environmental Impact Statement (EIS) is required. With this finding, I approve selection of the Proposed Action.

Ronald P. Fitch Jr. Date: 22 Dec 16

RONALD P. FITCH
COL, SF
Garrison Commander
Fort Carson, Colorado

Environmental Assessment for the Construction and Operation of two ranges: an Infantry Platoon Battle Course (Range 127) and an Infantry Squad Battle Course (Range 153) Fort Carson, CO. November 2016



Fort Carson
Directorate of Public Works, Environmental Division

ENVIRONMENTAL ASSESSMENT

Construction and Operation of two ranges: an Infantry Platoon Battle Course (Range 127) and an Infantry Squad Battle Course (Range 153)
Fort Carson, CO.

November 2016

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22 Dec 16
Date

ENVIRONMENTAL ASSESSMENT

Construction and Operation of two ranges: an Infantry Platoon Battle Course (Range 127) and an Infantry Squad Battle Course (Range 153)
Fort Carson, CO.

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ENVIRONMENTAL ASSESSMENT
Construction and Operation of two ranges: an Infantry Platoon Battle Course (Range 127) and an Infantry Squad Battle Course (Range 153)
Fort Carson, Colorado

1.0 PURPOSE, NEED, AND SCOPE

1.1 Introduction

This Environmental Assessment (EA) was prepared to evaluate the potential impacts of the Army's proposal to construct and operate a standard live-fire Infantry Platoon Battle Course (IPBC) (Range 127) and an Infantry Squad Battle Course (ISBC) (Range 153), on Fort Carson, Colorado. The Proposed Action will serve to provide adequate training facilities to conduct its military mission to meet evolving Army training standards. The Army's family of training ranges provides training opportunities to develop and improve Soldier and team proficiency and competence in the use of sophisticated weaponry. Individual soldier proficiency and collective training ranges realistically portray combat conditions to mold the team into an effective fighting unit.

The computer-controlled ranges of today allow trainers to develop scenarios and control targets and battlefield simulation devices. This computer technology combines with other training devices to create stressful, challenging scenarios for Soldiers to train as they will fight. Computerized systems also provide immediate performance feedback. After-action reviews (AAR), using data recorded during training, permits the commander to assess the unit's performance. This feedback allows leaders to assess the mission status of their unit and design training programs to overcome any identified shortcomings. The performance feedback highlights positive actions to reinforce correct procedures and to foster soldiers' confidence.

This section presents the purpose and need for the Proposed Action, defines the scope of the environmental analysis and issues to be considered, identifies decisions to be made, and identifies other relevant documents and actions.

In 2012, the Army prepared a Programmatic Environmental Assessment (PEA) which discussed the need for providing modern ranges that allowed Soldiers and units to train with existing weapons using current war-fighting doctrine, tactics and procedures to ensure their success on the battlefield and evaluated the potential environmental effects of modernizing and operating Army training ranges on previously disturbed ground where the total of disturbed ground would be approximately 40 acres or less. A checklist was provided for identifying any NEPA requirements beyond the PEA for constructing, renovating, and operating a training range at an Army installation in the United States. The Proposed Action did not meet this criteria (exceeded 40 acres), therefore a separate environmental analysis is necessary.

1.2 Purpose and Need for Proposed Action

The purpose for the Proposed Action is to provide realistic scenario-based live fire range facilities for Infantry Platoon and Squad-level training and assessment. The

Proposed Action is necessary to develop and improve Soldier and team proficiency and competence in the use of sophisticated weaponry to meet Fort Carson's present and future warfighting requirements.

1.2.1 IPBC

The proposed facilities for a new IPBC range would be used to train and test units up to the platoon level, either mounted or dismounted, on the skills necessary to conduct tactical movement techniques, detect, identify, engage and defeat stationary and moving infantry and armor targets in a tactical array. The platoon can conduct individual maneuvers as well as collective maneuvers (battle drills).

The dismounted platoon could practice the following critical training maneuvers:

- Ambush
- Movement to contact
- Attack
- Raid
- Retrograde
- Defend
- Reconnaissance/security

The standard IPBC does not accommodate aerial gunnery support activities, but would have rotary wing close air support for 30MM, .50 Cal and 7.62MM machine guns. The Proposed IPBC would meet all safety aspects to support live fire training exercises, and would support non-live fire conditions that include blanks, dry fire and Multiple Integrated Laser Engagement System (MILES).

Without proper training facilities, essential skills for live-fire combat operations would not be optimally developed for Soldiers training on Fort Carson. Training on the proposed IPBC would prepare infantry units for combat operations with the fully integrated and scenario based training for the threats the Army expects to encounter during Full Spectrum Combat Operations. The range is required to provide extended breadth and depth of infantry platoon live-fire engagements against a wide variety of targetry on challenging terrain.

1.2.2 Range 153 ISBC

Range 153 is an anti-tank training range with simulated firing using a 9 millimeter (mm) tracer lead round. Existing facilities include a tower, a latrine and bleachers. The Proposed Action would include extending this anti-tank range to incorporate the requirements of an ISBC to meet Army standards for maneuvering and live firing on this type of range.

All infantry squads must meet ISBC or equivalent training requirement prior to deployment. Fort Carson's 4th Infantry Division has 266 squads that require certification on this type of a range twice a year. Currently, Fort Carson has a shortage of automated operational ISBC's. Extending Range 153 to construct a standard ISBC, utilizing the existing facilities, equipment, and infrastructure would help alleviate

limitations in the scheduling of existing training facilities to meet the training requirements necessary so that Soldiers may enter future combat fully prepared to employ the full capabilities of their weapons and equipment.

1.3 Scope of Analysis

This EA analyzes effects of construction and operation of a standard live-fire IPBC and ISBC on Fort Carson.

This EA has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations issued by the President's Council on Environmental Quality (CEQ) published in 40 Code of Federal Regulations (CFR) Parts 1500-1508 and the Army's NEPA-implementing procedures published in 32 CFR Part 651, *Environmental Analysis of Army Actions (Army Regulation 200-2)*. This EA facilitates the Installation's planning and informed decision-making, helping the Garrison Commander and the public to understand the potential extent of environmental impacts of the Proposed Action and alternatives, and whether those impacts (direct, indirect, and cumulative) are significant.

This EA describes the potential environmental consequences resulting from the Proposed Action and the Alternatives on the following resource areas:
Air Quality, Biological Resources, Water Resources, Soils, Cultural Resources, Noise, Hazardous Materials/Waste, and Utilities. A brief description of issues eliminated from further analysis is in Section 3.1, *Valued Environmental Components (VECs) Not Addressed.*

1.4 Decision(s) to Be Made

The decision to be made is whether or not to implement the Proposed Action and if implementation would cause significant impacts to the human or natural environment. The final decision is the responsibility of the Garrison Commander at Fort Carson. If no significant environmental impacts are determined, based on the evaluation of impacts in the EA, a Finding of No Significant Impact (FNSI) will be signed by the Garrison Commander. If it is determined that the Proposed Action will have significant environmental impacts, either the action will not be undertaken, or a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) will be published in the *Federal Register*.

1.5 Agency and Public Participation

Public participation opportunities with respect to this EA and decision-making on the Proposed Action are guided by 32 Code of Federal Regulations (CFR) Part 651, *Environmental Analysis of Army Actions (Army Regulation* [AR] *200-2)*. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. All agencies, organizations, and members of the public having an interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, were given the opportunity to comment on this EA, as described below.

The Proposed Action and the entire record will be reviewed and the Agency will determine the foreseeable impacts and the need for mitigation. If the Proposed Action remains within the assessment parameters described in this assessment, the EA along with a Draft FNSI, with mitigation measures if applicable, will be available to the public for 30 days, starting from the last day of publication of the Notice of Availability (NOA) in the local media. The documents will be available at: http://www.carson.army.mil/DPW/nepa.html

Anyone wishing to comment on the Proposed Action or request additional information should contact the Fort Carson NEPA Coordinator, Directorate of Public Works; Environmental Division at: usarmy.carson.imcom-central.list.dpw-ed-nepa@mail.mil.

Pursuant to 651.14(b), Title 32 Code of Federal Regulations, the Army made the EA and Draft FNSI available to the public for review and comment for 30 days prior to a final decision. Copies of individual comment letters and the associated responses received during this period will be included in the final documentation in Appendix A. No public comments were received.

Section 106 of the National Historic Preservation Act
With regards to the IPBC, consultation in accordance with Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations 36 CFR Part 800 was initiated with the Colorado State Historic Preservation Officer (SHPO), Native American Tribes, and other consulting parties on 20 April 2015. Consultation also included thirteen federally recognized Native American Tribes, who are culturally affiliated with Fort Carson; the El Paso County Commissioners; Colorado Council of Professional Archaeologists; Colorado Preservation, Inc.; and the Tatanka Group, LLC. In a letter dated 30 April 2015, the SHPO concurred with Fort Carson's determination of "no adverse effect to historic properties" pursuant to 36 CFR 800.5(b). No other comments were received.

For the ISBC, Section 106 consultation was initiated with the SHPO for the expansion of Range 153 on 26 May 2015. Consultation also included 13 culturally affiliated, federally recognized Native American Tribes; the El Paso County Commissioners; Colorado Springs Land Use Review Board, Colorado Council of Professional Archaeologists; Colorado Preservation, Inc.; and the Tatanka Group, LLC. Follow-up consultation with the SHPO occurred on 6 August 2015. In a letter dated 9 October 2015, the SHPO concurred with Fort Carson's determination of "no historic properties affected" pursuant to 36 CFR 800.4(d)(1). Concurrences were also received from the Comanche Nation of Oklahoma on 28 May 2015 and the Tatanka Group, LLC, on 24 June 2015. No other comments were received.

See Section 4.6 for more information on cultural resources. Copies of the response letters are included in Appendix F.

1.6 Legal Framework
A decision on whether to proceed with the Proposed Action rests on numerous factors such as mission requirements, schedule, funding availability, safety, and

environmental considerations. In addressing environmental considerations, Fort Carson is guided by relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental and natural resources management and planning. These include, but are not limited to, the following:

- Clean Air Act;
- Clean Water Act;
- Noise Control Act;
- Endangered Species Act;
- Migratory Bird Treaty Act;
- National Historic Preservation Act;
- Archaeological Resources Protection Act;
- Resource Conservation and Recovery Act;
- Toxic Substances Control Act;
- EO 11988, Floodplain Management, as amended;
- EO 11990, Protection of Wetlands;
- EO 12088, Federal Compliance with Pollution Control Standards;
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations;
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks;
- EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management;
- EO 13175, Consultation and Coordination with Indian Tribal Governments;
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds; and
- EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance.

2.0 DESCRIPTION OF THE PROPOSED ACTION

This section describes the Proposed Action. 32 CFR 651 (AR 200-2) and Council on Environmental Quality regulations (40 CFR 1500) require the identification of reasonable alternatives to the Proposed Action, including the No Action Alternative, (described in Section 3.0). Alternatives sites on Fort Carson were evaluated and screened based on criteria detailed in section 3.3, below. There were no other alternative sites on Fort Carson that met all the siting criteria.

The Proposed Action is identified as the Army's preferred alternative.

2.1 Infantry Platoon Battle Course Range

2.1.1 Construction and Operation of an IPBC Range

The Proposed Action is to construct and operate an IPBC complex to support the infantry platoon live-fire collective training at Fort Carson. The IPBC would be constructed on an existing maneuver range (Range 127) at Fort Carson (Figure 2.1.1). Range 127 is adjacent to (southwest of) an off-limits area known as the old Battalion Field Training Area (BFTA) which may have been exposed (inconclusive) to

artillery suspect of depleted Uranium (DU). No munitions or remnants of munitions associated with DU have been found at the old BFTA, which is located within the Fountain Creek Watershed, across a road and ridgeline from Range 127, which lies within the Turkey Creek watershed. Although Range 127 was not suspect for exposure, soil samples were collected from four different areas that had the potential for water, soil and air migration from the adjacent BFTA, based on watershed and topography. Naturally occurring uranium has a ratio of U238 to U235 of 137.9. For DU associated with the M101 spotting round the ratio of U238 to U235 is 492.6. The ratio of U238 to U235 in samples collected was 131.8; therefore, the results are consistent with a naturally occurring source. All sample results were negative for DU.

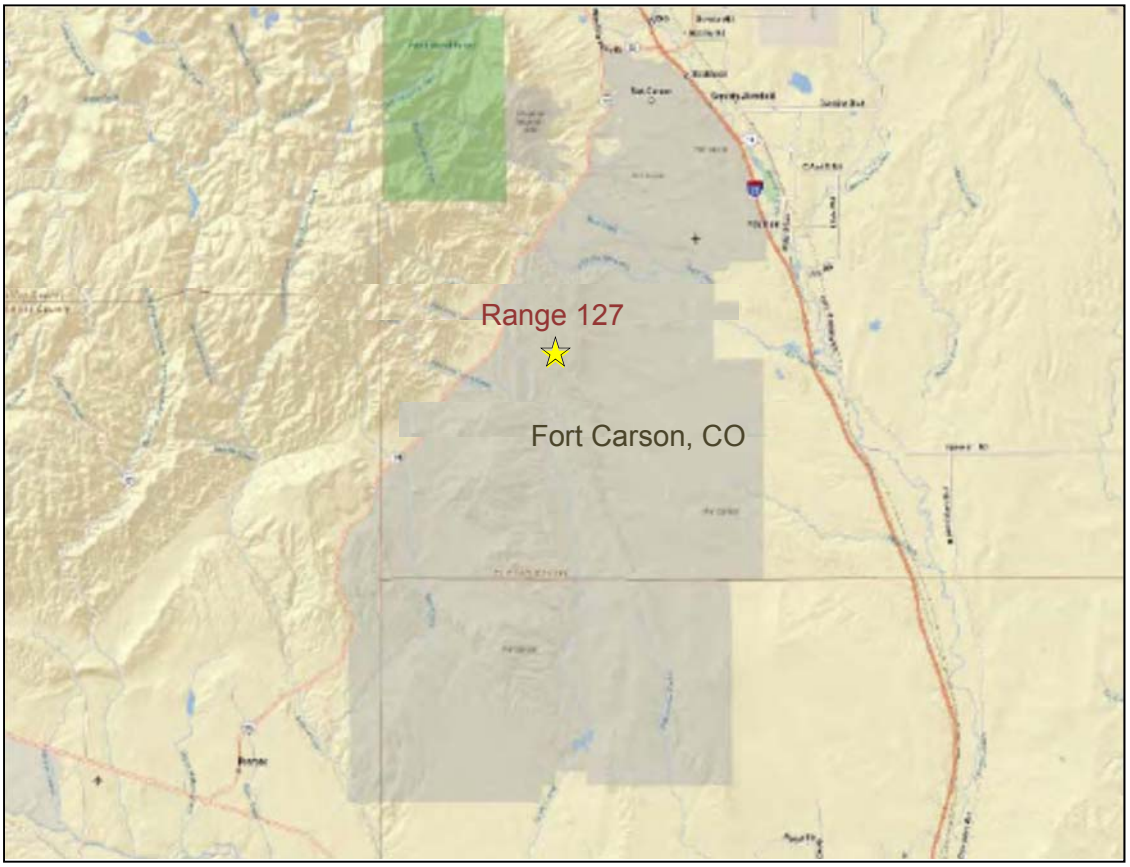

Figure 2.1.1 Location of Range 127 on Fort Carson, CO

Vehicles and weapons used on the range would include Abrams tanks, Bradleys, and strykers. Weapons would include M16/M4 series, M21, M24, M107, M249/M240B/M60, M2 and M203. Helicopter support would also be part of training at the proposed IPBC.

The standard IPBC includes the range and a range operations control area (ROCA).

2.1.1.1 The Range

The construction of the IPBC range would include five training stations. Primary facilities would be located within the perimeter of the range complex and include:

- Six Stationary Armor Targets (SAT)

- One Moving Armor Targets (MAT)
- Forty-three Stationary Infantry Targets (SIT)
- Fourteen Moving Infantry Targets (MIT)
- Nine Machine Gun Bunkers (MGB)
- One Trench Obstacles
- One Assault/Defend House
- Two Landing Zones (LZs)

2.1.1.2 Targetry

All targets are fully automated, and the event-specific target scenario is computer driven and scored from the range operations center tower. Targets receive and transmit digital data from the range operations center. The captured data is compiled and is available to the unit for use during the AAR.

2.1.1.3 The Range Operations Control Area (ROCA)

The construction of a ROCA to support a standard small arms range would include the following facilities:

- Control Tower – Small Arms
- Range Operations Center
- Operations/Storage Building
- General Instruction Facility
- Latrine
- Bleacher Enclosure
- Covered Mess
- Ammunition Breakdown Building

The Range Operation Center and Operations/Storage Building are used to operate and maintain the range. The Bleacher Enclosure and General Instruction Building are used for pre and post event instruction. The remaining buildings are to support the training and/or the troops being trained. The event-specific target scenario would be computer-driven and scored from the range control tower, which would be located approximately 200 meters (m) outside the ROCA. A central point would be constructed (about 230m outside ROCA) to install a camera. The LZ would be located approximately 350m from the ROCA. See Figure 2.1.1.3 for the proposed ROCA, tower, central point, and LZ locations.

Supporting facilities would include electrical service, site improvements, and information systems.

2.1.1.4 Layout

The IPBC would be constructed on an existing range (Range 127) at Fort Carson. Range 127 is within the maneuver and training area of Fort Carson, thus would require an unexploded ordnance (UXO) survey prior to construction. The existing Range 127 including SDZs is approximately 3,430 acres. The proposed construction of the IPBC would increase Range 127 to around 3,840 acres (Figure 2.1.1.4).

The proposed construction occupies an area approximately 1500 meters wide by 4000 meters long, plus an area for the ROCA facilities. Refer to the Layout Details in Appendix B of this document for the proposed IPBC ROCA layout. Strategies for the final range layout were based on the following criteria:

- Training directives, priorities, and guidance established by the installation's Chain of Command
- Platoon battle tasks
- Platoon mission-essential task list
- Platoon training priorities
- Training resources and availability

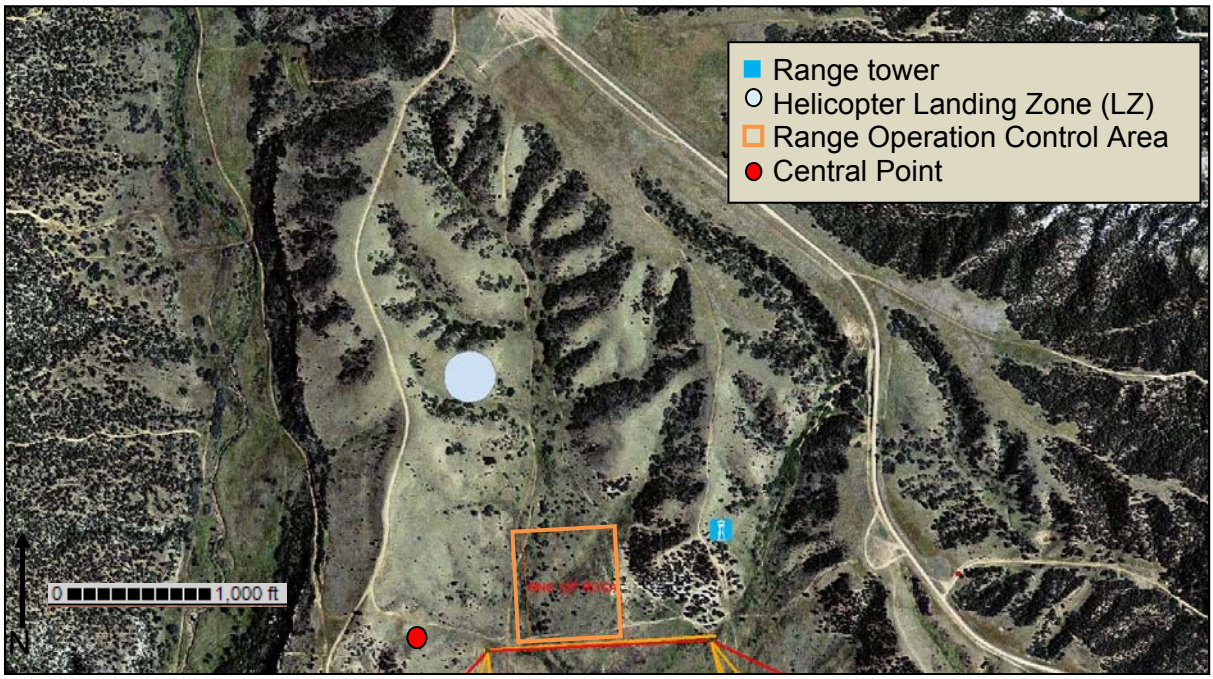

Figure 2.1.1.3 Proposed Range Operation Control Area, Tower, Central Point, and Helicopter Landing Zone at Range 127, Fort Carson, CO

The proposed construction occupies an area approximately 1500 meters wide by 4000 meters long, plus an area for the ROCA facilities. The ROCA would be designed according to army standard and the proposed IPBC layout of the buildings similar to those depicted in Appendix B.

Strategies for the final range layout were based on the following criteria:

- Training directives, priorities, and guidance established by the installation's Chain of Command
- Platoon battle tasks
- Platoon mission-essential task list
- Platoon training priorities
- Training resources and availability
- Terrain Availability

2.1.2 Description of the IPBC Target Emplacements and Objectives

This section describes the scope and dimensions of the individual target emplacements and objectives that comprise the Infantry Platoon Battle Course range. To minimize the impacts from ground disturbance, the majority of the target types would be constructed above grade or ground level. Figure 2.1.2 depicts the proposed layout of the targetry, LZs, range tower, central point, and ROCA.

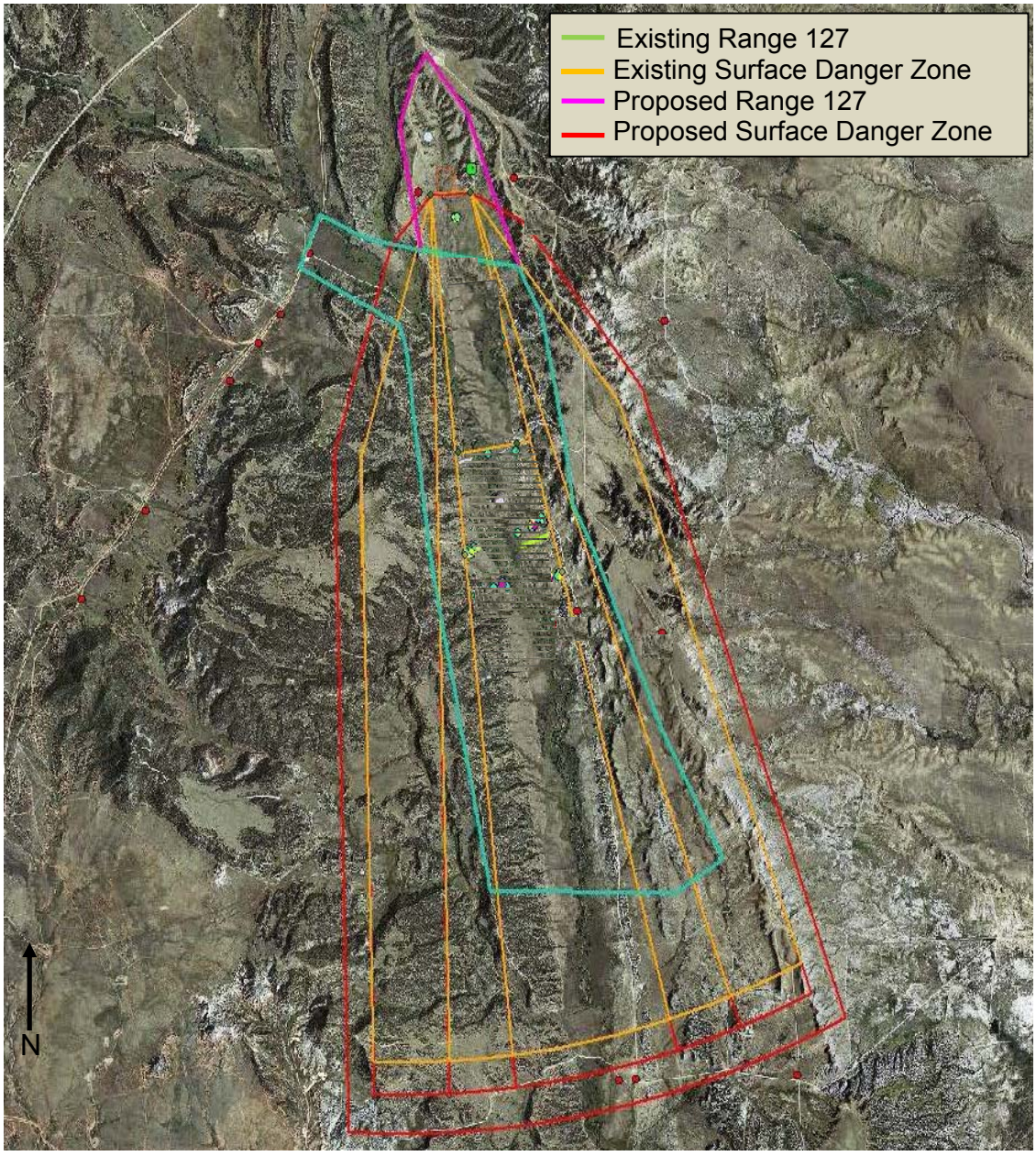

Figure 2.1.1.4 Existing Range 127 SDZs and Proposed Range 127 SDZs Area.

2.1.2.1 Stationary Armor Targets (SATs):

The SAT emplacements would be constructed by utilizing 2 feet (2') by 2' by 6' (2'X2'X6') solid concrete blocks, commonly referred to as "Ecology blocks". The blocks would be stacked (2) to create a retaining wall on three sides and then a

protective earthen berm would be emplaced on the outside of the blocks. [Note: fill material from old erosion control (EC) ponds could be utilized.]

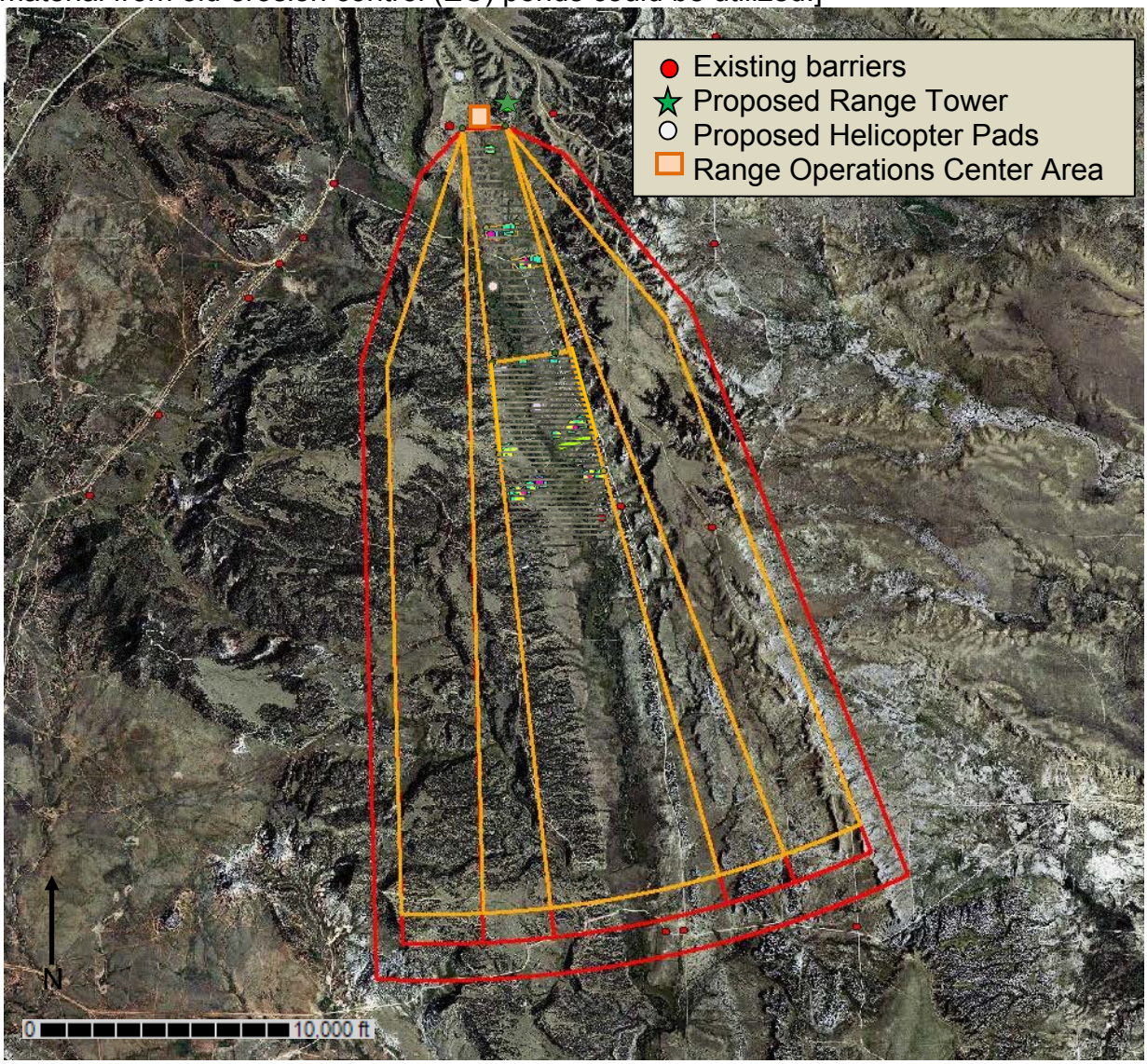

Figure 2.1.2 Proposed Layout of the IPBC at Range 127, Fort Carson, CO

The SAT emplacement, retaining wall and dirt berm are required to provide protection and concealment to the target lifting mechanism and associated hardware from the projectiles fired at the target silhouettes (see Figure 2.1.2.1).

Low rounds are usually captured by the compacted earthen berm. The floor of the emplacement would consist of crushed rock surrounding a 4'X4'X4" concrete pad. The target raising mechanism would be anchored to the concrete slab. Normally, SATs can be placed above- or below- grade but in an effort to minimize ground disturbance and associated impacts, target emplacements would be constructed above grade.

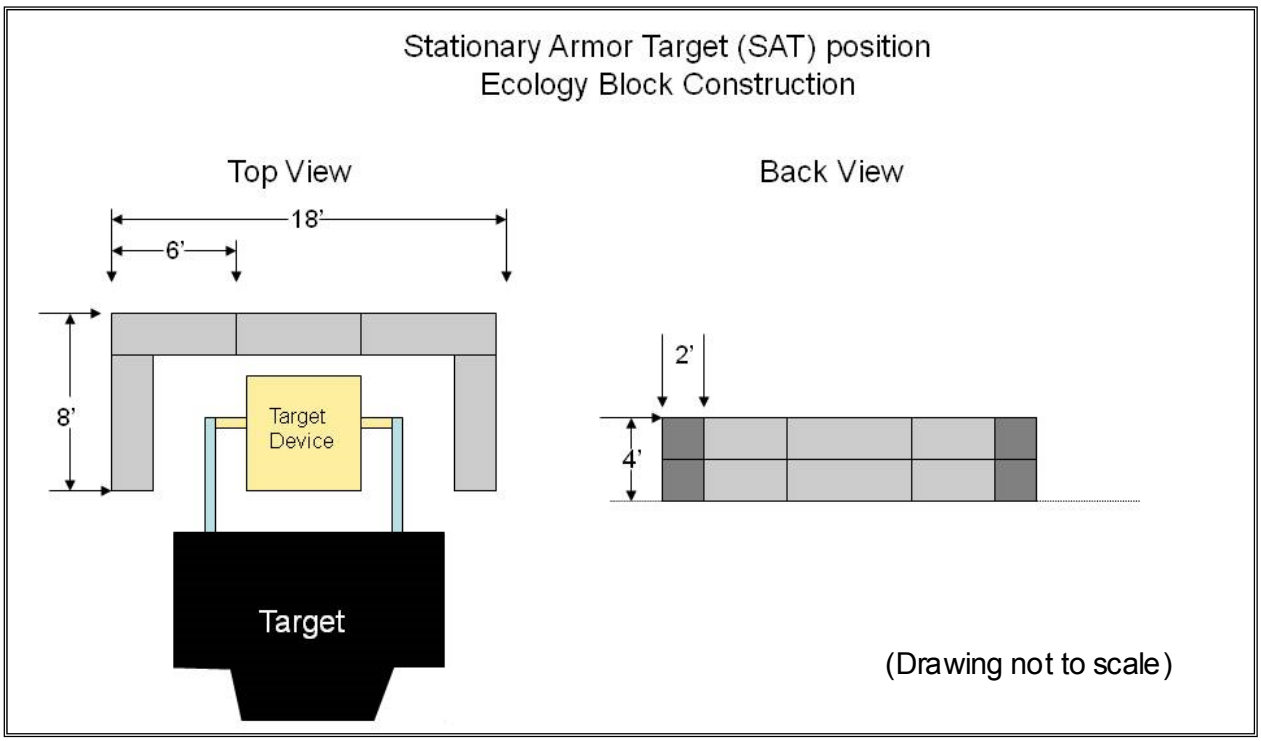

Figure 2.1.2.1 Representative SAT Emplacement Elevation Drawing

2.1.2.2 Moving Armor Targets (MAT):
There would be one MAT emplacement constructed on the proposed Range 127 by utilizing 2'X2'X6' Ecology blocks. Ecology blocks are large concrete blocks with a groove in the bottom face and a tongue on the top face to eliminate slippage when they are stacked. The blocks would be stacked (3) to create a retaining wall on three sides and then a protective earthen berm would be emplaced on the outside of the blocks. The MAT emplacement, retaining wall and dirt berm are required to provide protection and concealment to the target lifting mechanism, target carrier, target track and associated hardware from the projectiles fired at the target silhouettes (See Figure 2.1.2.2).

Low rounds are usually captured by the compacted earthen berm. The floor of the emplacement would consist of crushed rock and a steel track assembly that will provide guided movement of the target carrier and lifting mechanism. The track assembly would be anchored to the ground using 3-foot steel stakes. Normally, MATs can be places above- or below-grade but in an effort to minimize ground disturbance and associated impacts, the MAT would be constructed above-grade. Only minimal leveling of the site would be required.

2.1.2.3 Stationary Infantry Targets (SITs):
The SIT emplacements would utilize a three-sided, Abrasion Resistant 500 steel manufactured protective housing and a protective earthen berm. Construction of the SIT emplacements would require only minimal ground leveling where each individual target would be placed above grade.

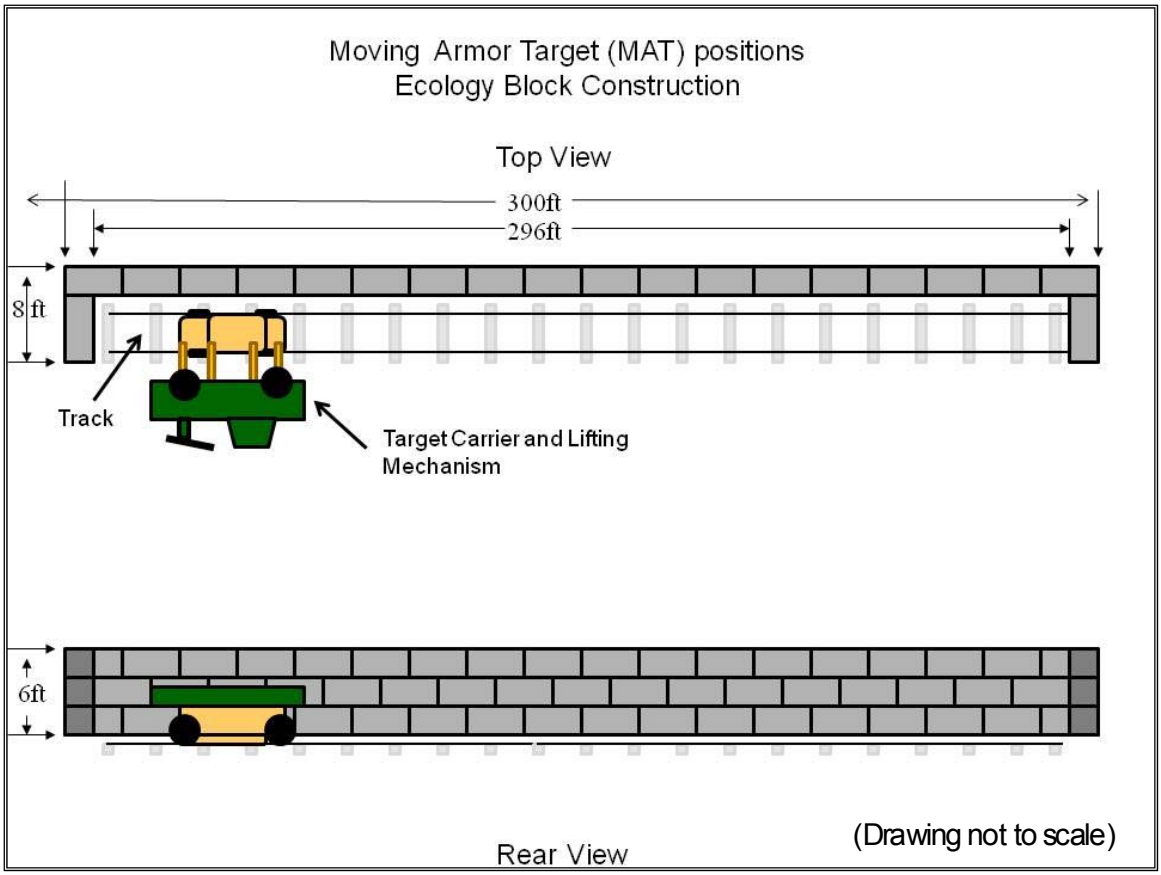

Figure 2.1.2.2 Representative MAT Emplacement Elevation Drawing

The three-sided protective housing is constructed of hardened steel and is designed to protect the infantry target lifting mechanism from projectiles fired at the target silhouette. The SIT emplacement housing would have dirt placed in front and to the sides (See Figure 2.1.2.3).
Low rounds are usually captured by the compacted earthen berm. The floor of the emplacement would not require any work, as the target raising mechanism would be placed directly on top of the ground. Normally, SITs can be placed above- or below-grade but in an effort to minimize ground disturbance and associated impacts, target emplacements would be constructed above grade.

2.1.2.4 Moving Infantry Targets (MITs):
The MIT emplacements would be constructed by utilizing 2'X2'X6' Ecology blocks. The blocks would be laid end to end to create a retaining wall on three sides and then a protective earthen berm would be emplaced on the outside of the blocks (Figure 2.1.2.4).

The MIT emplacement, retaining wall and dirt berm are required to provide protection and concealment to the target moving and lifting mechanism and associated hardware from the projectiles fired at the target silhouettes. Low rounds are usually captured by the compacted earthen berm.

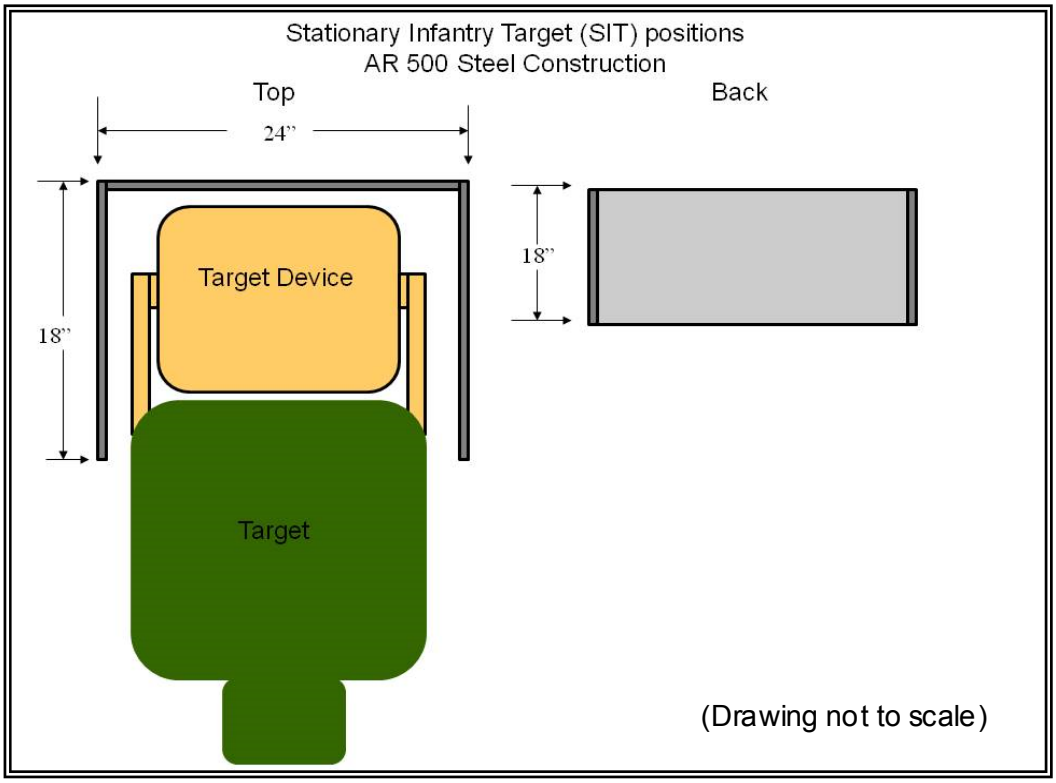

Figure 2.1.2.3 Representative SIT Emplacement Elevation Drawing

The floor of the emplacement would consist of crushed rock and a steel track assembly that will provide guided movement of the target carrier and lifting mechanism. The track assembly would be anchored to the ground using 3-foot steel stakes. Normally, MITs can be placed above- or below- grade but in an effort to minimize ground disturbance and associated impacts, target emplacements would be constructed above grade.

2.1.2.5 Machine Gun/Observation Bunkers:

The earth-covered and sand-bagged bunker simulates a typical enemy defensive machinegun bunker. The proposed ranges would each contain 2 actual bunkers 6'X6' and 3 simulated "mock" bunkers (wooden boxes that resemble a bunker).
Each machinegun bunker would be accompanied by one SIT, one night muzzle flash simulator (NMFS), and one infantry hostile fire simulator (IHFS). A night muzzle flash simulator is a simulator that uses Light Emitting Diodes (LEDs) to replicate the flash of enemy machine gun fire. The IHFS is a simulator that replicates the sound of enemy machine gun fire. The SIT, NMFS, and IHFS would be positioned in a manner that will draw attention to the bunker. To accommodate the standard design, the SIT, NMFS, and IHFS must be located outside of the bunker (See Figure 2.1.2.5). The two bunkers would be constructed of wood above ground.

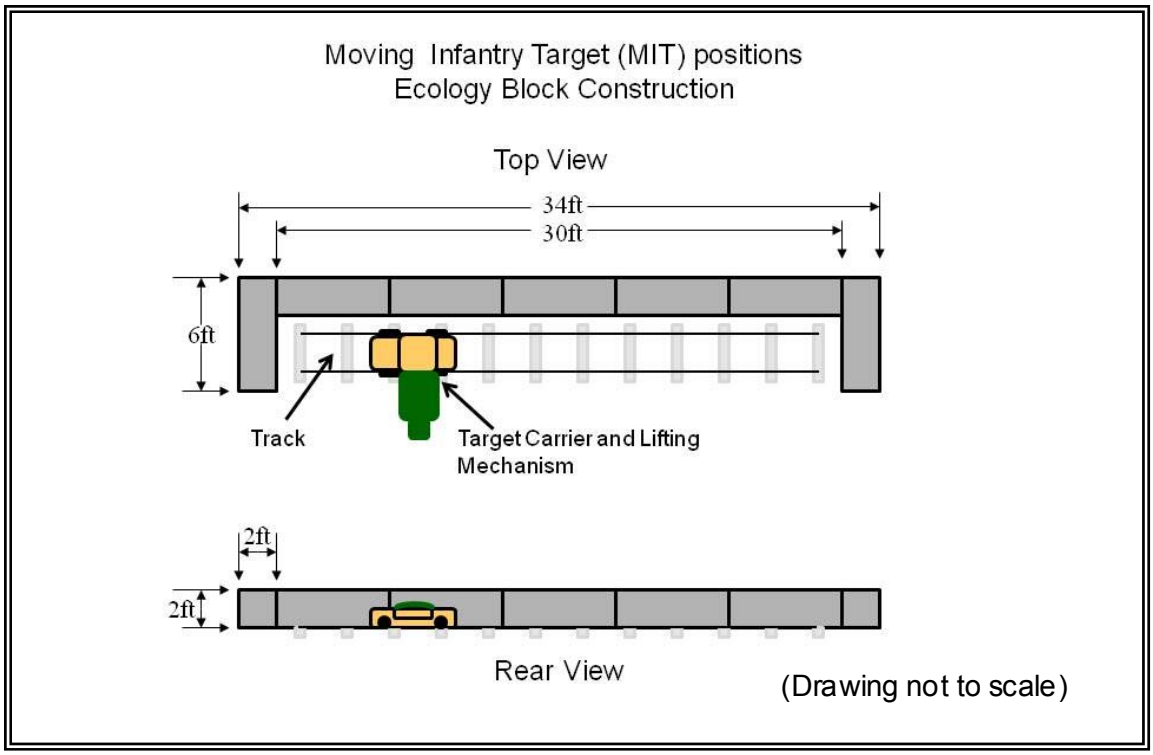

Figure 2.1.2.4 Representative MIT Emplacement Elevation Drawing

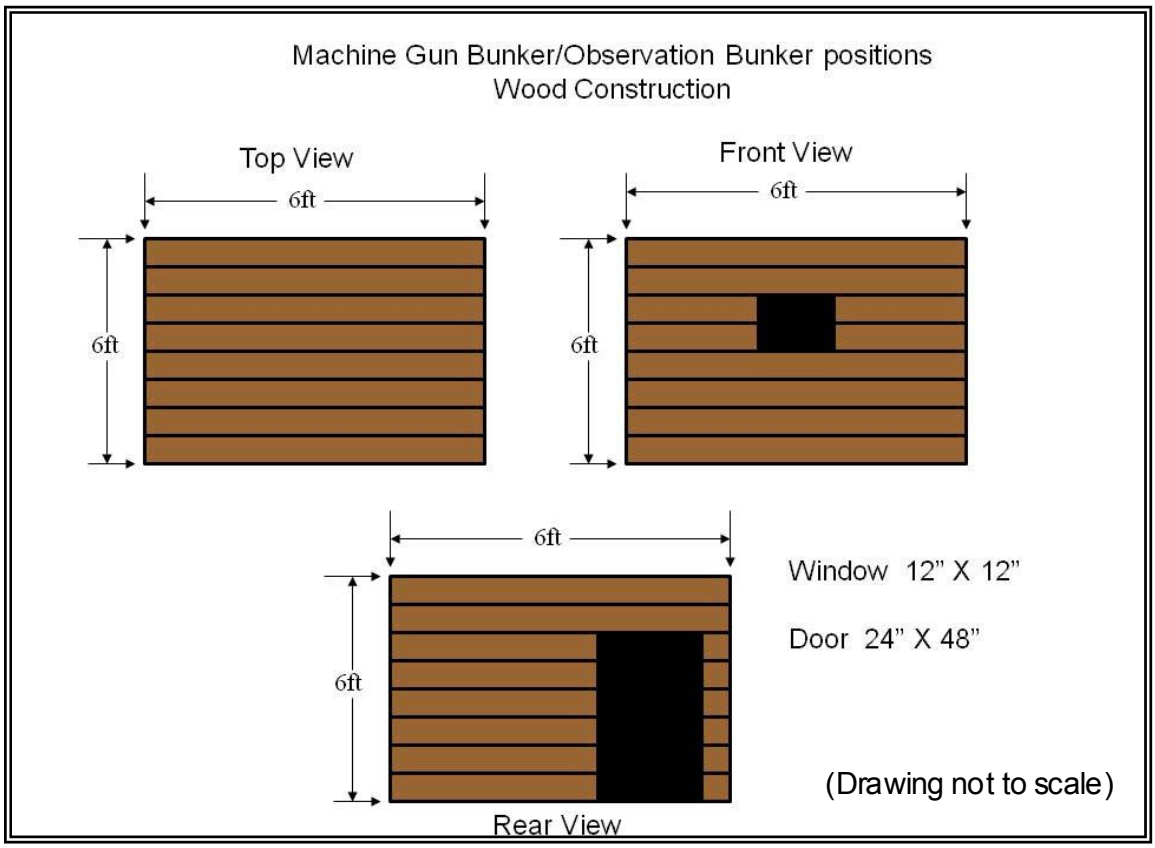

Figure 2.1.2.5 Representative Machine Gun / Observation Bunker Elevation Drawing

2.2 Range 153 ISBC

2.2.1 Construction and Operation of an ISBC at Range 153

The Proposed Action would include the construction and operation of an ISBC at the existing Range 153 to allow to support the infantry squad live-fire collective training at Fort Carson.

Range 153 is located in the central area of Fort Carson bordering the east side of the Large Impact Area (Figure 2.2.1). Range 153 is an anti-tank training range with simulated firing using a 9mm tracer lead round. It does not support live firing of anti-tank missiles on the range. Under the Proposed Action, the existing facilities would remain and the range would be extended to the north to incorporate Range 153T (a temporary range) to allow construction and operation of an ISBC.

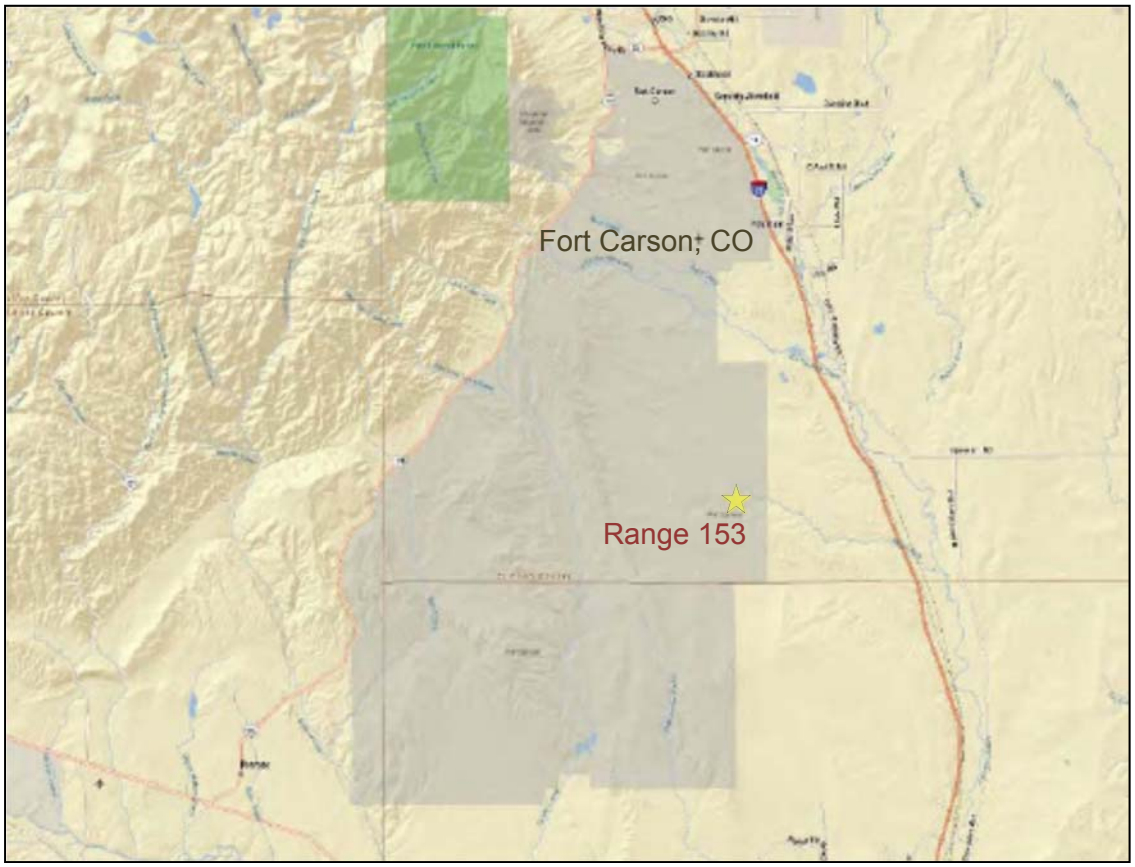

Figure 2.2.1 Location of Range 153 on Fort Carson, CO

2.2.1.1 The Range

The ISBC would be a reconfigurable live fire range and would be used to conduct tactical movement techniques, to detect, identify, engage, and defeat an enemy doctrinal tactical array of stationary and moving infantry and armor targets. In addition to live-fire, this range would also be used for training with blank ammunition, simulated munitions, sub-caliber munitions and/or eye-safe laser training devices. The ISBC would include six different objective areas and would contain six SATs, one MAT, twenty SITs, six MITS, two trench obstacles, and up to five machine gun

bunkers/observation. Mortar simulation device emplacements would be located in areas from which unfriendly mortar fire is to be simulated. Each emplacement would contain one battle/sound effects simulator. Types of vehicles utilizing this range would be Humvee's, Stryker's (except those with mobile gun systems) and Bradley's. Helicopter landing areas, designed for heavy use, would be located to support aerial insertion and extraction of the squad. Weapons used on the range would be .50 Cal and below.

2.2.1.2 Targetry

The targets would be radio-controlled. The majority of the targets would be constructed above grade or ground level. Descriptions of the SAT, MAT, SIT, MIT, and machine gun/observation bunkers are the same as those described in Section 2.1.2.

2.2.1.3 The Range Operations Control Area (ROCA)

The current footprint of the existing Range 153 has bleachers, a range tower with power and fiber, and a latrine. The proposed Range 153 ISBC would not change the current footprint of the ROCA.

2.2.1.4 Layout

The ISBC would be an extension of the existing range (Range 153) at Fort Carson. Range 153 is within the maneuver and training area of Fort Carson, thus would require an unexploded ordnance (UXO) survey prior to construction and/or target placement. The existing Range 153 is approximately 31 acres. The proposed ISBC would increase Range 153 to around 185 acres. The Surface Danger Zones (SDZs) will increase in area, extending from a firing point to a distance downrange based on the projectiles fired (Figure 2.2.1.4).

2.2.2 Description of the ISBC Target Emplacements and Objectives

To minimize the impacts from ground disturbance, the majority of the target types would be constructed above grade or ground level. The proposed layout of the targetry, the trench, and the proposed Range 153 maneuver box are depicted in Figure 2.2.2.

3.0 ALTERNATIVES CONSIDERED

This section describes alternatives to the Proposed Action. 32 CFR Part 651 (AR 200-2) and Council on Environmental Quality regulations (40 CFR 1500) require the identification of reasonable alternatives to the Proposed Action, including the No Action Alternative. Alternatives sites on Fort Carson were evaluated and screened based on criteria detailed in section 3.3, below. There were no other alternative sites on Fort Carson that met all the siting criteria.

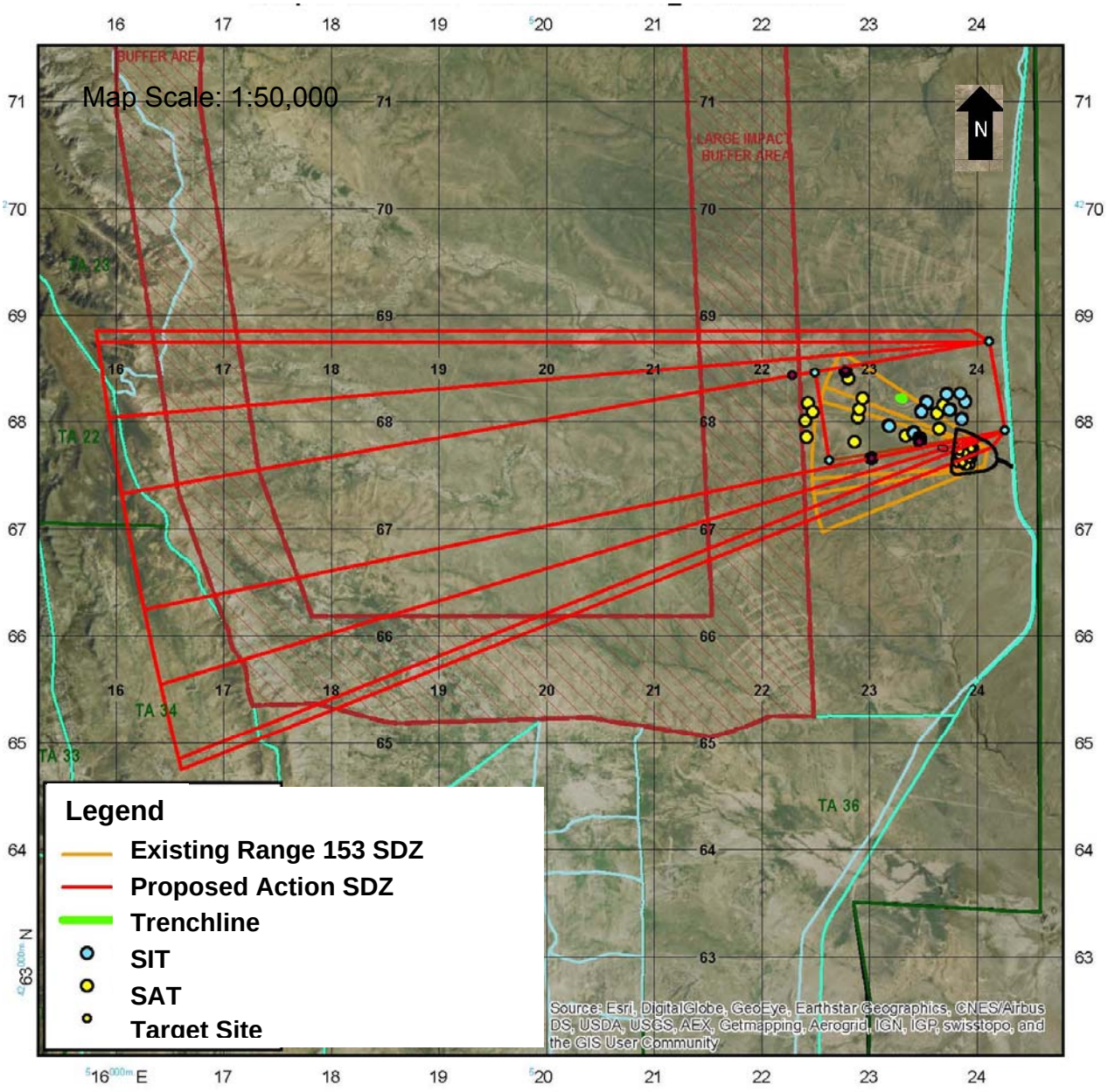

Figure 2.2.1.4 Proposed Range 153 ISBC Extended Surface Danger Zones (SDZs) on Fort Carson, CO

3.1 Valued Environmental Components (VECs) Not Addressed

Initial analyses resulted in the elimination of some potential issues because they were not of concern or were not relevant to the Proposed Action and alternatives. Brief discussions of the rationale for these decisions are below.

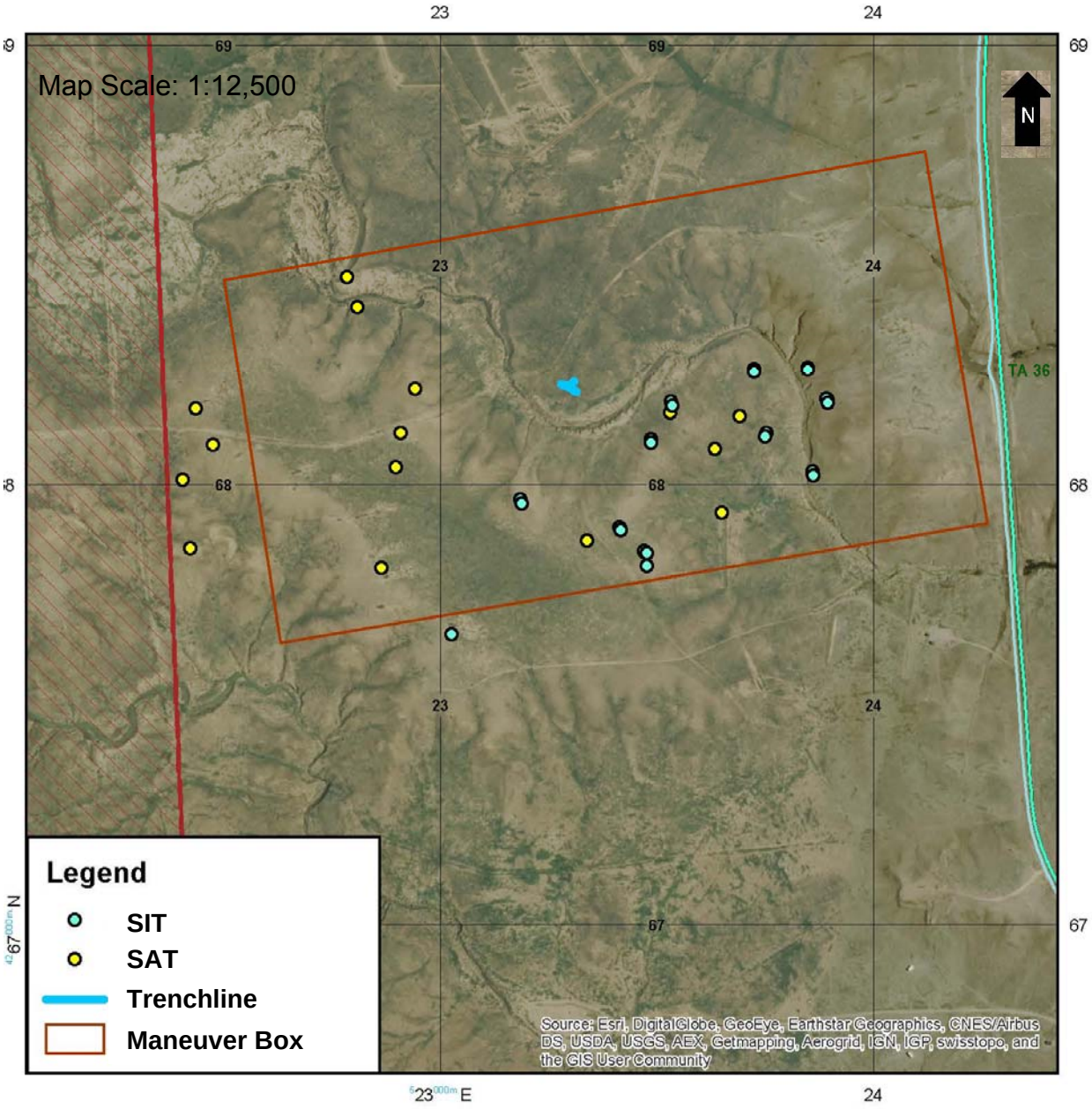

Figure 2.2.2 Proposed Range 153 ISBC Extended Target Placements on Fort Carson, CO.

Environmental Health and Safety Risks for Children
Neither the Proposed Action nor its alternatives would change environmental health or safety risks to children since the area is well within the boundaries of Fort Carson in an area designated for training. Neither the Proposed Action nor its alternatives would have significant or disproportionate adverse effects on children or pose health or safety risks.

Environmental Justice

Neither the Proposed Action nor its alternative would change any existing impacts with regard to minority and low-income populations.

Geology and Topography
Neither the Proposed Action nor its alternatives would have any measurable effects on geologic resources or topography.

Land Use
The Range 153 ISBC would not change existing land use on any lands. Lands affected by the Proposed Action on Fort Carson would continue to be used primarily for military training. However, when the proposed IPBC range would be in operation, lands within the surface danger zone would not be available for military maneuvers or other uses.

Air Space Use
Neither the Proposed Action nor its alternatives would change existing airspace use on Fort Carson.

Hazardous Waste/Materials
Neither the Proposed Action nor its alternatives would generate additional hazardous wastes or use additional hazardous materials. The likelihood to encounter contamination on proposed project site is remote. Any discovery of hazardous material contamination would require appropriate regulatory coordination and compliance. If contamination is encountered, appropriate measures would be taken to remediate the site.

Facility operation would not use hazardous substances or generate hazardous wastes that are different from those already occurring on Fort Carson range areas due to military operations. Any spills would be cleaned up in accordance with the Fort Carson Spill Prevention, Control, and Countermeasures Plan and Fort Carson Regulation 200-1. No storage tanks would be required as all power would be electric. An Environmental Protection Plan would be prepared for the project. This plan would include provisions from other Fort Carson plans, such as the Spill Control Plan, Recycling and Waste Minimization Plan, Contaminant Prevention Plan, and others.

Transportation
Neither the Proposed Action nor alternatives would impact traffic patterns on Fort Carson or surrounding communities.

Socioeconomics
There may be a slight beneficial economic impact resulting from the construction of the Proposed Action; however this would be short-term and temporary.

Visual and Aesthetic Resources
Neither the Proposed Action nor alternatives would impact visual or aesthetic resources.

Sustainability
Neither the Proposed Action nor alternatives would impact sustainability as the area is already a range/training area.

Utilities
Neither the Proposed Action nor alternatives would impact utilities as there is no requirement for external power, water, and/or fiber. In conjunction with Fort Carson's sustainability initiatives, the new IPBC range would utilize renewable energy to operate the target devices and power the precautionary safety markings. More specifically, the individual targets would incorporate a 55-watt Photovoltaic solar panel to recharge the device and the safety markings (firing limit markers & flag pole) would operate from solar rechargeable hazard lights. Another initiative involved relates to sustainable construction; the intended method of establishing the target emplacements and objectives involves above grade construction for the majority of the range footprint. Through above grade construction and the use of renewable energy, there would be minimal requirement for ground disturbance (excavation and trenching) which would result in reduced ground disturbance, the reduced likelihood of inadvertent impact to natural and cultural resources, and no increased demand on commercial power. Lastly, the largest component of the construction materials would be ecology blocks, 2ft X 2ft X 6ft solid concrete blocks. The ecology blocks would provide a sustainable resource that could be used again in the future when deemed necessary to reconfigure the layout of the range or provide the flexibility to remove them from the range if/when doctrinal training standards change in the future.

3.2 No Action Alternative

Consideration of the No Action Alternative is a requirement of the NEPA process. It provides a basis of comparison for the Proposed Action and also addresses issues of concern by avoiding or minimizing effects associated with the Proposed Action. Under this alternative there would be no construction or operation of the IPBC range or the ISBC at Range 153. Implementing the No Action Alternative would deny unit commanders and the individual Soldiers the opportunity to conduct the required tactical movement techniques, detect, identify, engage, and defeat stationary and moving infantry and armor enemy targets in a realistic and relevant tactical array. Military units that train at Fort Carson would continue to fall short of meeting their assigned Mission Essential Task List (METL) prior to deployment into harms' way or in order to maintain proficiency levels. Fort Carson does not possess adequate quantities of these specific types of training ranges. Thus, units that train at Fort Carson would not have the opportunity to train on these types of ranges if the No Action Alternative was implemented. Therefore, this alternative will be considered in the environmental consequences analysis to provide a baseline for environmental conditions only.

3.3 Alternative Sites Eliminated from Further Consideration

Alternatives to the ISBC at Range 153 and the IPBC range at Range 127 on other sites on Fort Carson were evaluated and screened based on the following criteria:

These criteria must be achieved to meet mission as well as cost requirements for the Proposed Action:

- minimization of effects on the other military missions at Fort Carson (*e.g.*, other small arms training, large weapon systems training, maneuver training, restricted airspace);
- minimization of significant environmental effects (*e.g.*, avoidance of National Register of Historic Places-eligible cultural resources sites and Native American sacred sites; avoidance of effects to federal-listed species, special interest areas, and wetlands);
- minimization of safety, health, and nuisance issues, particularly with the general public (*i.e.*, avoiding areas with existing or likely future housing, minimizing noise consideration; minimizing range ordnance risks [using existing impact areas]);
- securing a reliable and cost-effective source of power for ranges;

The Proposed Action sites were existing range sites that met these requirements. There were no other alternative sites on Fort Carson that met all the above siting criteria. Due to the fact that Range 127, 153 and Range 153T already exist, the Proposed Action would utilize these existing ranges, reducing the potential for new disturbances. The ISBC Range 153T would be merged with Range 153 to form the one range. A comprehensive alternative analysis matrix of other locations considered for the IPBC in Appendix C.

An Alternative considered included demolition and larger caliber weapons (20mm and greater) at Range 153 to accommodate more flexibility in training, however noise models indicated that this proposal had the potential for Zone II and Zone III increases outside the installation boundary, such that this alternative was eliminated from further consideration (See Section 4.7).

4.0 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATION

This section discloses potential environmental effects of each alternative and provides a basis for evaluating these effects in context relative to effects of other actions. Effects can be direct, indirect, or cumulative. Direct effects occur at the same place and time as the actions that cause them, while indirect effects may be geographically removed or delayed in time. Council on Environmental Quality (CEQ) guidance states that a cumulative impact is an effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant, actions taking place locally or regionally over a period of time. For the purposes of the cumulative impacts analysis, the Proposed Action Region of Influence (ROI) is defined to include Fort Carson and adjacent lands (including communities around the Installation). Appendix D lists the past, present, and reasonably

foreseeable future Army actions (defined as those projects that are well-developed, in mature planning stages, and/or have funding secured), and other actions within the ROI, that were reviewed in conducting the cumulative effects analysis. Conceptual projects, broad goals, objectives, or ideas listed in planning documents that do not meet the above criteria are not considered reasonably foreseeable for the purposes of this analysis.

This EA focuses on resources and issues of concern in the following resource areas:
Air Quality
Soils
Water Resources
Biological Resources
Cultural Resources
Noise
Areas with no discernible concerns or known effects, as identified in the issue elimination process (Section 3.1, *Valued Environmental Components (VECs) Not Addressed*), are not included in this analysis.

For ease in comparing environmental effects with existing conditions and mitigation specific to each environmental area of concern, each below section will describe existing conditions, describe the effects of each alternative, identify any cumulative effects on that area of concern, and describe site-specific mitigation. A summary of environmental consequences and general mitigation is provided in Chapter 5.

4.1 General Information – Location and Surrounding Land Uses

Fort Carson is located in central Colorado at the foot of the Rocky Mountains in El Paso, Fremont, and Pueblo counties (Figure 4.1a). To the north is Colorado Springs, to the east is Interstate-25 and mixed development, to the south are privately-owned ranches, and to the west is State Highway 115 (Figure 4.1b). Downtown Colorado Springs and Denver lie approximately 8 miles and 75 miles, respectively, to the north, while the City of Pueblo is located approximately 35 miles south of the main post area.

Fort Carson covers approximately 137,000 acres, and extends between 2 and 15 miles east to west and approximately 24 miles north to south. The main post area, which consists of developed land and a high density of urban uses, is located in the northern portion of the installation and covers approximately 6,000 acres. The downrange area, which is used for large caliber and small-arms live-fire individual and collective training; aircraft, UAS, wheeled and tracked vehicle maneuver operations; and mission readiness exercises, covers approximately 131,000 acres of unimproved or open lands.

Additionally, there are approximately 25,600 acres of Army Compatible Use Buffer (ACUB) lands along the eastern and southern boundaries of the installation. These lands buffer military training activities from neighboring communities and protects the unique local short grass prairie open spaces from future development. The Army reaches out to partners to identify mutual objectives of land conservation and to prevent development of critical open areas to preserve high-value habitat and limit

incompatible development in the vicinity of military installations. For more information on the ACUB program visit the U.S. Army Environmental Command's website: http://aec.army.mil/Services/Conserve/ArmyCompatibleUseBufferProgram.aspx

Butts Army Airfield is located in the northeast quadrant of the downrange area and is used for command and control of flight operations as well as maintenance and repair of aircraft.

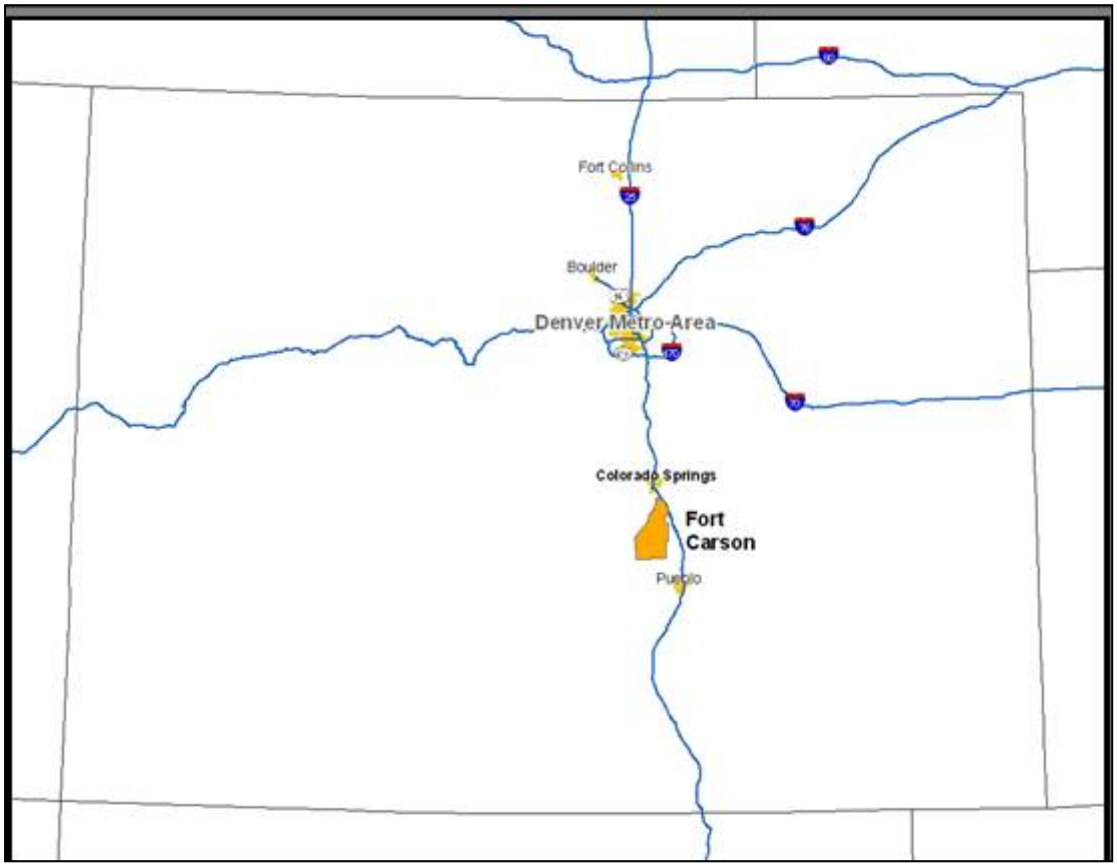

Figure 4.1a. Location of Fort Carson, Colorado

4.1.1 Climate

The region including Fort Carson is classified as mid-latitude semi-arid, characterized by hot summers, cold winters, and relatively light rainfall. July is the warmest month with the average daily maximum temperature of 84.4° Fahrenheit, and January is the coldest with an average daily minimum temperature of 14.5° Fahrenheit.

Mean annual precipitation at Fort Carson increases toward the northwest. Colorado Springs averages 17.5 inches of precipitation annually, with about 80 percent falling between April and September. Average annual snowfall in the region is 42.4 inches. Snow and sleet usually occur from September to May with the heaviest snowfall in March and possible trace accumulations as late as June.

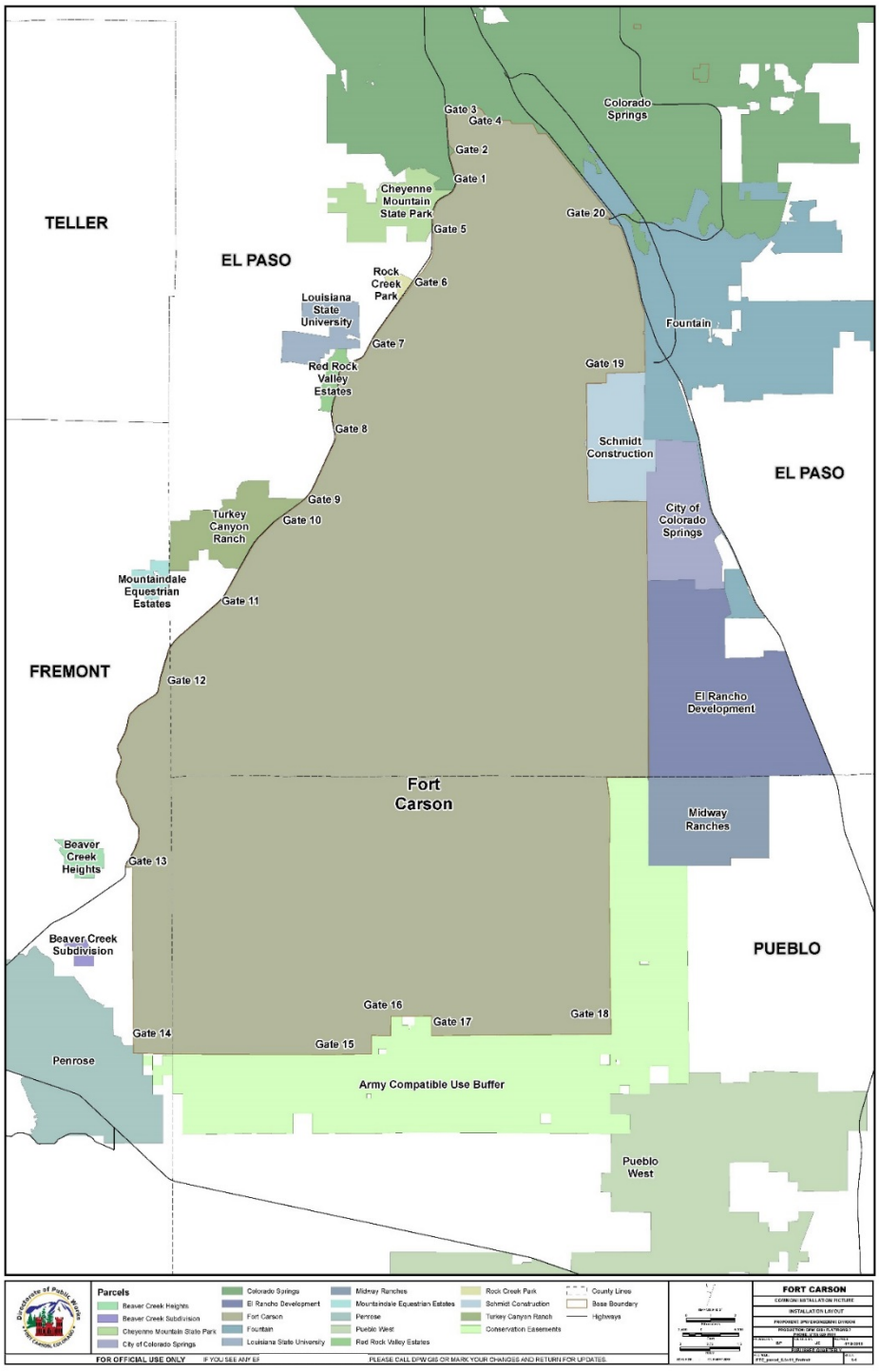

Figure 4.1b Lands Neighboring Fort Carson, Colorado

4.2 Air Quality

4.2.1 Existing Conditions

Fort Carson is within the air quality control areas of El Paso, Fremont, and Pueblo counties, including the City of Colorado Springs. Both Fremont and Pueblo counties are in attainment for all criteria pollutants. The Colorado Springs Urbanized Area in El

Paso County is in attainment (meeting air quality standards) for all National Ambient Air Quality Standards (NAAQS) criteria pollutants. However, it was classified as a maintenance area for carbon monoxide (CO) in 1999 due to a 1988 violation of the 8-hour CO standard. This CO maintenance area includes the majority of Fort Carson's main post area (north of Titus Boulevard and Specker Avenue). The BAAF is outside of the attainment/maintenance area. This designation is currently set to run through 2019 (CDPHE, 2009).

Fort Carson stationary and fugitive emission sources, in general, include boilers, high temperature hot water generators, furnaces/space heaters, emergency generators, paint spray booths, fuel storage and use operations, facility-wide chemical use, road dust, military munitions, and smokes/obscurants. Fort Carson's air pollutant emissions generation occurs through the combustion of fossil fuels via equipment such as boilers (a stationary source) and motorized vehicles (a mobile source). Combustion products mainly include Green House Gases (GHGs), predominantly carbon dioxide (CO2); CO; nitrogen oxide (NOx); sulfur dioxide (SO2); and particulate matter (PM), both as inhalable coarse particles (PM10) and fine particles (PM2.5), which is PM whose diameter is less than or equal to 10 and 2.5 micrometers (μm), respectively. Road dust is predominantly a source of PM10.

The Installation manages its air emissions per regulatory requirements, management plans, and Best Management Practices (BMPs) for Fort Carson and PCMS. Key among these is its Clean Air Act (CAA) Title V operating permit (No. 95OPEP110). Fort Carson's BMPs include the Fugitive Dust Control Plan (Fort Carson, 2012), Integrated Wildland Fire Management Plan (Fort Carson, 2011), Title V Paint Booth Operating Standards, and Ozone Depleting Compound Management Plan. BMPs support the Installation in ensuring environmental compliance, stewardship, and sustainability.

The EPA has defined three types of GHG emission sources. They are defined as the following:

- Scope 1 – GHG emissions emitted directly from the facility by stationary, fuel burning sources.
- Scope 2 – GHG emissions emitted indirectly from the facility. This includes the purchase of electricity, heat or steam from a utility.
- Scope 3 – GHG emissions not controlled directly by the facility. This includes employee commuting emissions, wastewater treatment, and solid waste disposal.

The Installation's predominant stationary Scope 1 GHG emission sources are on-post boilers at Fort Carson. Scope 2 includes emissions from utilities in providing power to Fort Carson and PCMS.

The Installation reports GHG emissions from Fort Carson and PCMS, as required, on an annual basis per 40 CFR 98 Subpart C. In 2015, the Army estimated these emissions (Scope 1) to be about 60,000 metric tons CO2 equivalent per year.

4.2.2 Environmental Consequences

4.2.2.1 Proposed Action

The Proposed Action would not change regional air quality conditions. The impacts on air quality and GHG from the implementation of the Proposed Action would be minor. Construction would have short-term minor adverse impacts on air quality due to minor increases in fugitive dust (i.e., airborne dust caused by vehicles, equipment, and wind) and vehicle emissions caused by the operation of heavy equipment. Operations under the Proposed Action would have minor long-term adverse impacts on air quality due to a minor increase in firing activity and use of smoke grenades on the installation. The firing of weapons produces smoke and lead dust. In an outdoor setting, the effect on air quality is not significant.

Estimated emissions from the construction and operations under the Proposed Action would be below the threshold for PSD (less than 40 tons/year) and not expected to require changes in air permits for existing stationary emission sources. The firing of rifles, pistols, and shotguns produces smoke and localized lead dust. In an outdoor setting, this effect on air quality is not significant. The effect of residual lead dust, that is, lead dust that has fallen on the ground or onto equipment, can be a health risk to range operators and maintenance staff when the dust is disturbed or stirred up and then inhaled. The use of personal protective equipment and good hygiene (i.e., hand washing after touching soil or equipment that may be contaminated) would limit exposure of range operators and maintenance staff to lead. The lead dust that travels away from the firing lines would be at insignificant concentrations that it would not affect local flora and fauna.

The Range 153 ISBC doesn't include any new air emissions sources (e.g. Fuel storage tanks, generator power or boilers) and the structures are already in place (e.g. Control tower and bleachers), therefore there would be no impact on air quality due to construction. The construction proposed for Range 127 could have temporary and minor increases in air pollution from the use of construction equipment (combustion emissions) and the disturbance of soils (fugitive dust) during construction.

The Proposed Action is outside of the carbon monoxide maintenance area and is not subject to New Source Review (NSR) and minor NSR requirements. Additionally, the Proposed Action is not a major stationary source (potential to emit 100/250-tons/year of any pollutant regulated by the Clean Air Act) in accordance with Prevention of Significant Deterioration requirements. The Proposed Action is not anticipated to result in violations of NAAQS

4.2.2.2 No Action Alternative

Under the No Action Alternative, there would be no impacts to air quality associated with the construction and/or operation of the Proposed Action.

4.2.3 Cumulative Effects

Environmental effects from past and current Army actions, when added to the anticipated environmental effects of the Proposed Action, would not result in any significant long-term effects to air quality because operations are within construction permit and fugitive dust permit requirements. These requirements are designed to ensure that emissions do not significantly affect air quality. Therefore, there would be no significant cumulative effect from the combined environmental effects of the Proposed Action and those of past, present and reasonable foreseeable future actions. Temporary and minor increases in air pollution would occur from the use of construction equipment (combustion emissions) and the disturbance of soils (fugitive dust) during construction. The air emissions from the proposed operational activities do not exceed Federal *de minimis* thresholds. The impacts on air quality and GHG from the implementation of this alternative would be minor.

4.2.4 Site-specific Mitigation

Fort Carson personnel using smoke (smoke grenades) would obtain meteorological condition data prior to and during such operations. Wind direction and speed would be monitored to ensure that visible smoke emissions would not be transported across the Installation boundary, per the Fort Carson Smoke and Obscurant Compliance Plan.

The contractor and Omaha District, U.S. Army Corps of Engineers would submit any required construction and/or land development construction permit applications. Applications would include a fugitive dust control plan and would include all land disturbance associated with this project. Short-term air quality degradation would occur during the construction phase but would be mitigated by a variety of fugitive dust control measures.

Appropriate emission control devices on vehicles and equipment used for construction would minimize effects to air quality. Heating and air conditioning equipment would be regularly maintained to minimize the risk of above-normal emissions from these units

4.3 Soils

4.3.1 Existing Conditions

4.3.1.1 IPBC

The Areas of Interest (AOI) for the Proposed Action include the Surface Danger Zones (SDZs). The SDZs are the area extending from a firing point to a distance downrange based on the projectiles fired. The soil compositions and soil descriptions of the proposed construction of the IPBC were collected from the Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture (USDA) (NRCS 2014). The AOI encompasses approximately 12,700 acres. There are thirty-eight soil types described within the AOI. Of these only seven are over three percent of the area and are described in detail below. Over 1,100 acres of the AOI are unsurveyed as they fall within the large impact area of Fort Carson. The seven soil types described are Kim loam, Manvel silt loam, Nederland cobbly sandy loam, Penrose-Manvel complex, Schamber-Razor complex, Stroupe-Travessilla-Rock outcrop complex, and Ustic Torrifluvents. Stroupe-Travessilla-Rock outcrop complex makes up the largest

percentage of the AOI with about 28 percent. Appendix E contains a map of the AOI and information on the major soil types within the area.

Kim loam (3 percent of the AOI) is a well-drained soil with 1 to 8 percent slopes. A typical profile is 0 to 6 inches loam and 6 to 60 inches loam. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is high at about 9.6 inches.

Manvel silt loam (9.7 percent of the AOI) is a well-drained soil with 2 to 6 percent slopes. A typical profile is 0 to 5 inches silt loam, 5 to 32 inches silt loam, 32 to 48 inches silt loam, and 48 to 79 inches silt loam. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is moderate at about 8.6 inches.

Nederland cobbly sandy loam (5.3 percent of AOI) is a well-drained soil with 9 to 25 percent slopes. A typical profile is 0 to 5 inches cobbly sandy loam, 5 to 11 inches very cobbly loam, 11 to 28 inches very cobbly clay loam, 28 to 60 inches very cobbly sandy loam. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is low at about 4.5 inches.

Penrose-Manvel complex (9.0 percent of AOI) is a well-drained soil with 3 to 45 percent slopes. A typical profile is 0 to 4 inches channery loam, 4 to 11 inches channery loam, and 11 to 14 inches unweathered bedrock. Its depth to restrictive feature is 10 to 20 inches to lithic bedrock. The available water storage in the profile is very low at about 1.3 inches.

Schamber-Razor complex (6.8 percent of AOI) is a well-drained soil with 8 to 50 percent slopes. A typical profile is 0 to 5 inches gravelly loam, 5 to 15 inches very gravelly loam, and 15 to 60 inches very gravelly sand. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is low at about 3.0 inches.

Stroupe-Travessilla-Rock outcrop complex (28.0 percent of AOI) is a well-drained soil with 9 to 90 percent slopes. A typical profile is 0 to 8 inches stony loam, 8 to 16 inches very stony clay loam, 16 to 35 inches extremely stony clay loam, and 35 to 39 inches unweathered bedrock. Its depth to restrictive feature is 20 to 40 inches to lithic bedrock. The available water storage in the profile is very low at about 2.7 inches.

Ustic Torrifluvents (4.2 percent of AOI) is a well-drained soil with 0 to 3 percent slopes. A typical profile is 0 to 6 inches variable and 6 to 60 inches stratified loamy sand to clay loam. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is moderate at about 8.6 inches.

4.3.1.2 Range 153 ISBC

The soil compositions and soil descriptions within the Area of Interest (AOI) of the proposed Range 153 ISBC encompasses approximately 20,800 acres. There are

twenty-one soil types described within the AOI. Of these only six are over three percent of the area and are described in detail below. Approximately 11,000 acres (about 52%) of the AOI are unsurveyed as they fall within the large impact area of Fort Carson. The six soil types described are Heldt clay loam, Kim loam. Manvel loam, Penrose-Manvel complex, Schamber-Razor complex, and Stroupe-Travessilla-Rock outcrop complex. Stroupe-Travessilla-Rock outcrop complex makes up the largest percentage of the AOI with about 7 percent. Appendix E contains a map of the AOI and information on the major soil types within the area.

Heldt clay loam (5.7 percent of the AOI) is a well-drained soil with 0 to 3 percent slopes. A typical profile is 0 to 8 inches clay loam, 8 to 41 inches silty clay, and 41 to 60 inches silty clay loam. Its depth to restrictive feature is more than 80 inches. The available water storage in the profile is high at about 10.4 inches.

Kim loam (3.3 percent of the AOI) is a well-drained soil with 1 to 8 percent slopes. A typical profile is 0 to 6 inches loam and 6 to 60 inches loam. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is high at about 9.6 inches.

Manvel loam (5.7 percent of the AOI) is a well-drained soil with 3 to 9 percent slopes. A typical profile is 0 to 3 inches loam and 3 to 60 inches loam. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is high at about 9.6 inches.

Penrose-Manvel complex (5.8 percent of AOI) is a well-drained soil with 3 to 45 percent slopes. A typical profile is 0 to 4 inches channery loam, 4 to 11 inches channery loam, and 11 to 14 inches unweathered bedrock. Its depth to restrictive feature is 10 to 20 inches to lithic bedrock. The available water storage in the profile is very low at about 1.3 inches.

Schamber-Razor complex (5.4 percent of AOI) is a well-drained soil with 8 to 50 percent slopes. A typical profile is 0 to 5 inches gravelly loam, 5 to 15 inches very gravelly loam, and 15 to 60 inches very gravelly sand. Its depth to restrictive feature is greater than 80 inches. The available water storage in the profile is low at about 3.0 inches.

Stroupe-Travessilla-Rock outcrop complex (6.8 percent of AOI) is a well-drained soil with 9 to 90 percent slopes. A typical profile is 0 to 8 inches stony loam, 8 to 16 inches very stony clay loam, 16 to 35 inches extremely stony clay loam, and 35 to 39 inches unweathered bedrock. Its depth to restrictive feature is 20 to 40 inches to lithic bedrock. The available water storage in the profile is very low at about 2.7 inches.

4.3.2 Environmental Consequences

4.3.2.1 IPBC

The construction disturbance would impact the soils by removing vegetation within the area and making it prone to wind and water erosion. However, this would be

temporary during construction. Upon completion of the construction, the area would be stabilized and Best Management Practices (BMPs) employed. Further, this range is for dismounted training only, vehicle traffic would be confined to roads and trails, to deliver troops to the range. If necessary, BMPs such as turnouts, sediment traps, hardening, etc. could be applied. There are existing erosion control dams in place. They would collect any sediment that might escape the footprints of the proposed range.

Overall, the effects of construction under the Proposed Action would be minor, and easily controlled by standard BMPs. Effects of operations under the Proposed Action would be minimal, due to the dismounted nature of the training.

4.3.2.2 Range 153 ISBC

Potential impact from the proposed Range 153 improvements are expected to be minor with proper use of BMPs as described in Section 4.3.4 below. Dismounted training (Soldiers on foot) impacts would be minor. The movement of tanks, Bradleys, and Strykers would be mostly confined to roads and trails, however due to the slopes within the area of the range, there is the potential for some erosion to occur along the roads. Streams/gullies crossings could also cause sediment to translocate.

4.3.2.3 No Action Alternative

Under the No action alternative, training in this range would continue, but there would be no additional impacts to soil as a result of the Proposed Action.

4.3.3 Cumulative Effects

Cumulative, long term effects on soils resulting in sedimentation and/or fugitive dust, could be potentially significant if left unrepaired, however, Fort Carson policy is to eliminate or minimize dust and the degradation of all water resources on Fort Carson and ensure compliance with all applicable federal, state and local quality standards (see Sections 4.2 and 4.4). Any impacts from the Proposed Action would be mitigated by use of BMPs to catch potential sediment, such as reestablishing the area by reseeding, use of silt fences, rock check dams, rock-lined ditches, hardened crossings, and other rehabilitation efforts. Monitoring by Integrated Training Area Management (ITAM) personnel would evaluate the land condition and employ proper rehabilitation methods as necessary. It is expected that, with monitoring and employment of standard BMPs, cumulative effects would not be significant.

4.3.4 Site-specific Mitigation

Periodic visual monitoring for erosion.
Build or re-build the earthen berms using material removed from existing dams or other areas requiring excess sediment removal. Install/construct rock-lined ditches, rock check dams in series, hardened crossings, etc. as needed to control any sediment production that might occur along roads and trails. Consider using armored vehicle launch bridges (AVLBs) or similar devices to temporarily bridge gullies and streams.

4.4 Water Resources

4.4.1 Existing Conditions

Fort Carson policy is to eliminate or minimize the degradation of all water resources on Fort Carson and ensure compliance with all applicable federal, state and local water quality standards (Fort Carson Regulation 200-1). Water resources are managed in coordination with U.S. Geological Survey (USGS), NRCS, U.S. Fish and Wildlife Service (USFWS), and many other external agencies. The *Water Resources Management Program* on Fort Carson includes watershed/sedimentation monitoring and management and project reviews to address erosion and sediment control issues. In addition, the *Stormwater Management Plan* (Fort Carson 2016) is designed to reduce the discharge of pollutants from Fort Carson to drainage ways, to protect water quality, and to satisfy Colorado's water quality standards.

4.4.1.1 Surface Water and Watersheds

The primarily undeveloped southern and western portions of Fort Carson drain into the Arkansas River to the south. The highly developed and industrialized portion of Fort Carson (the main post area) consists of four tributaries within the Fountain Creek watershed that provide local surface drainage: B Ditch, Clover Ditch, Infantry Creek (formerly known as Central Unnamed Ditch), and Rock Creek. The constituent of concern in Fort Carson's portion of the Fountain Creek watershed is *E. coli* (5 Code of Colorado Regulation [CCR] 1002-93, Colorado Regulation #93). Fountain Creek also ultimately discharges to the Arkansas River. The main document that currently guides surface water and watershed management at Fort Carson is the Fort Carson Stormwater Management Plan (SWMP) (Fort Carson, 2016). This SWMP is designed to reduce the discharge of pollutants from Fort Carson to the maximum extent practicable and to protect water quality.

4.4.1.1.1 IPBC

The proposed IPBC is within the Turkey Creek Watershed, which flows to the Arkansas River. Turkey Creek is not listed on the 303(d) list of impaired waterways in the State of Colorado.

4.4.1.1.2 Range 153 ISBC

The proposed Range 153 ISBC is within the Sand Creek and Young Hollow Watersheds, which flow to the Arkansas River. Fountain Creek and its tributaries are listed as impaired for E.coli as described above.

4.4.1.2 Hydrogeology and Groundwater

Groundwater at Fort Carson exists in both alluvial and bedrock aquifers. The primary aquifer at Fort Carson is the Dakota-Purgatoire bedrock aquifer. In general, the quality of the groundwater on Fort Carson is good with the exception of localized areas of high dissolved solids and sulfates exceeding secondary drinking water standards and elevated nitrates and Selenium (Se) exceeding primary drinking water standards.

A site wide Se study looking at the occurrence and distribution of Se in groundwater at Fort Carson was conducted in August 2011 (Summit Technical Resources, 2011),

with results coordinated with and concurred on by the CDPHE (CDPHE, 2011). Se has been detected at concentrations greater than the Colorado Ground Water Standard (0.05 milligrams per liter [mg/L] (0.05 parts per million [ppm])) and the Fort Carson background concentration (0.27 mg/L [0.27 ppm]) in samples collected from groundwater monitoring wells located primarily within Fort Carson's main post area. Analysis of qualitative and quantitative data from this study indicates a naturally occurring source (Pierre Shale) for relatively high Se concentrations in Fort Carson's compliance monitoring wells (Summit Technical Resources, 2011).

Range 127 is adjacent (southwest) of the BFTA which may have been exposed (inconclusive) to artillery spotter rounds containing depleted Uranium (DU). The former BFTA is located within the Fountain Creek watershed, across a road and ridgeline from Range 127, which lies within the Turkey Creek watershed. Although Range 127, was not suspect for exposure, samples were collected from four different areas based on watershed and the possibility of migration due to surface water run-off during heavy rain events. The results of all samples taken were negative for DU.

4.4.1.3 Floodplains

EO 11988, *Floodplain Management*, as amended in 2015 requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative and to use natural systems, ecosystem processes, and nature-based approaches when developing alternatives for consideration. To accomplish this objective, the Army is required to take actions to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains for certain federal actions. The acquisition, management, and disposal of federal lands and facilities are specific qualifying federal actions addressed within the EO. Subsequently, the EO requires the application of accepted flood-proofing and other flood protection measures for new construction of structures or facilities within a floodplain. Agencies are required to achieve flood protection, wherever practicable, through elevation of structures above the elevation of the floodplain rather than filling in land.

4.4.2 Environmental Consequences

4.4.2.1 IPBC

Turkey Creek and associated tributaries, which are US jurisdictional waters, throughout this project area have the potential to be impacted. However, construction and operation of the Proposed Action must meet the regulatory requirements of the Clean Water Act (CWA) Section 404 for wetlands and Section 402 under the National Pollutant Discharge Elimination System (NPDES) as it applies to Fort Carson's Municipal Separate Storm Sewer System (MS4), the Multi-Sector General Permit (MSGP) for Industrial Discharges, and the Construction General Permit (CGP); therefore impacts would be minimized in order to remain in compliance.

4.4.2.2 Range 153 ISBC

Sand Creek and Young Hollow are tributaries to Fountain Creek and are US jurisdictional waters. These waterways have the potential to be impacted under the Proposed Action. Construction and operation of the Proposed Action must meet the regulatory requirements of the Clean Water Act (CWA) Section 404 for wetlands and Section 402 under the National Pollutant Discharge Elimination System (NPDES) as it applies to Fort Carson's Municipal Separate Storm Sewer System (MS4), the Multi-Sector General Permit (MSGP) for Industrial Discharges, and the Construction General Permit (CGP); therefore impacts would be minimized in order to remain in compliance.

4.4.2.3 No Action

Under the No Action Alternative, there would be no change to water quality from construction or operation of the Proposed Action.

4.4.3 Cumulative Effects

Cumulative effects on water resources would be slightly greater during construction, and on a permanent basis as well as due to the addition of impervious surface for the ROCA. The impacts, however, would not be significant, and would be mitigated by use of BMPs during construction and directing runoff from new impervious surfaces to the surrounding pervious areas. In addition, a requirement of the CGP is the re-establishment of existing vegetation which would reduce the potential for erosion and sedimentation. After construction and during utilization, both the IPBC and the Range 153 ISBC will be monitored by Integrated Training Area Management (ITAM) personnel to evaluate the land condition and employ proper rehabilitation methods as necessary.

4.4.4 Site-specific Mitigation

Vehicular stream crossings should be hardened to reduce water turbidity.
Design should take into account heavy rainfall and/or flooding patterns in this area to protect structures and buildings from potential extensive damage.
A Stormwater Pollution Prevention Plan (SWPPP) must be developed in accordance with the Fort Carson SWMP and submitted to the Fort Carson Stormwater Program for review and approval prior to filing a Notice of Intent (NOI) with the U.S. Environmental Protection Agency (USEPA) for coverage under the Construction General Permit (CGP). Per the CGP permit requirements, all disturbed areas must be stabilized (i.e. landscaping, seed, gravel, etc.) to achieve a stabilization rate of 70 percent of the preexisting condition prior to project completion. Reseeding must only be conducted with Fort Carson approved methods and seed mixes. The Fort Carson Stormwater Program must inspect the construction site and approve the Notice of Termination (NOT) prior to the submittal of the NOT to the USEPA.

The Range 153 ISBC will not include additional construction or land disturbance associated with construction, therefore would not require a SWPPP or NOI.

In addition, in accordance with the Fort Carson MSGP, areas on the installation that deal with ammunition breakdown, storage or residues must be covered to minimize the contact with precipitation.

4.5 Biological Resources

4.5.1 Existing Conditions

Additional information regarding flora and fauna on Fort Carson is in *Fort Carson's Integrated Natural Resource Management Plan* (INRMP) (Fort Carson 2013). Unless stated otherwise, below information is from those sources.

4.5.2 Vegetation

The *Fort Carson* INRMP (Fort Carson, 2013) contains detailed descriptions of the vegetative communities on Fort Carson and a listing of common and scientific names of plant species known to occur. Integrated Pest Management is used to manage invasive plant populations, such as the exotic invasive tamarisk (*Tamarix ramosissima*), as mandated by DoD. Integrated Pest Management includes biological, chemical, mechanical, and cultural management techniques. As reported in the 2011 *CAB Stationing PEIS*, the main post area and BAAF consist primarily of non-native ornamentals and large trees. Within flight pattern zones of BAAF, non-native ornamentals and large trees are removed for aircraft operational needs and to reduce the occurrence of bird air strike hazard (BASH). The Wilderness Road Complex area, with vegetation considered to be in fair condition, consists primarily of a mix of disturbed land, western wheatgrass/blue grama, small soapweed/blue grama, and big bluestem/little bluestem. Further details on vegetation, including noxious weeds, are available in the 2009 *Fort Carson Grow the Army FEIS* (Fort Carson, 2009).

Approximately 1,550 acres of Pinyon-Juniper woodlands are within the area of interest of the proposed IPBC at Range 127, with an additional approximately 3,700 acres of mixed Ponderosa pine and Pinyon-Juniper forest stands directly adjacent to the west (i.e. the Timber Mountain complex). These forest stands vary in age and density classes with a mixed understory of Gambel's oak and native bunch grass communities.

Range 153 consists mainly of grasses (Needle and Thread/New Mexico feathergrass) and Four-winged saltbush. There are little to no trees within the area of interest. The stream channel crossing Range 153 contains invasive Tamarisk trees.

4.5.3 Wildlife, including Threatened and Endangered (T&E) Species

Federally Listed Species

The Endangered Species Act defines an endangered species as any species in danger of extinction throughout all or a major portion of its range. A threatened species is one that is likely to become endangered in the foreseeable future. Candidate species are those for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened, but listing is precluded by other higher priority species. Table 4.5-3 presents federally-listed

endangered, threatened, and candidate species found on Fort Carson. No critical habitat for these species has been designated on Fort Carson.

Table 4.5-3 Federally-Listed Endangered, Threatened, and Candidate Species Known to occur at Fort Carson.

Species	Scientific Name	Species Type	Status	Distribution on Fort Carson
Mexican spotted owl	*Strix occidentalis*	Bird	T	Rare winter resident
Arkansas Darter[1]	*Etheostoma cragini*	Fish	C	Introduced to multiple sites on Fort Carson
Black-footed ferret	*Mustela nigripes*	Mammal	E	Migrated onto Fort Carson from reintroduction area

Source: Fort Carson, 2013
[1]Species is also identified as state-listed.
C- Candidate
T- Threatened
E- Endangered

Mexican Spotted Owl –Threatened Species
The Mexican Spotted Owl occasionally winters in rugged forested canyons west of Fort Carson. It is a rare winter resident on Fort Carson and known to have occurred only on and adjacent to Booth Mountain. It is not known if the species is present annually. A radio tagged owl present on Fort Carson in the winter of 1995-1996 did not return in subsequent years. The species is not suspected of breeding on Fort Carson.

Arkansas Darter- Candidate Species
The Arkansas darter is a federal candidate for listing as a threatened species. The darter is found at a few sites on the installation. It is not known to occur within the project area.

Black-footed ferret – Endangered Species
The Black-footed ferret was reintroduced on adjacent private landowner property in October of 2013. Fort Carson obtained a Programmatic Safe Harbor Agreement as well as the associated Biological Opinion, from the USFWS, to ensure no land use restrictions would occur as result of the ferret reintroduction action. The only area the ferret is known to occur on Fort Carson is in close proximity to the southern boundary.

There are several species that are Federal Candidates, Federal Birds of Conservation Concern, State threatened, endangered, or Species of Special Concern that may occur on Fort Carson. An exhaustive list and detailed accounts of all species that occur on Fort Carson can be found in the INRMP (Fort Carson, 2013). Those species

that could occur in the proposed project site are discussed in the following paragraphs.

Black-tailed Prairie Dog
Proposed Range 127 has four black-tailed prairie dog towns, totaling approximately 48.05 acres, exist within the proposed construction area. Six black-tailed prairie dog towns, totaling approximately 181.10 acres, exist within the SDZ area. No prairie dog towns exist in the proposed Range 153 ISBC. The black-tailed prairie dog, a former candidate for federal listing, is common on Fort Carson, but numbers are decreasing. In 2009, there were 65 colonies totaling 6,513 acres and in 2013, 77 colonies were mapped, totaling 2,702 acres. It is listed as a Species of Special Concern in Colorado by the CPW and the CNHP. Frequently referred to as a keystone species of the shortgrass prairie ecosystem, the prairie dog plays a significant role in life cycles of several Species of Special Concern on Fort Carson: the ferruginous hawk, bald and golden eagles, mountain plover, and the state-listed burrowing owl. Prairie dogs are managed on Fort Carson according to prescriptions detailed in the installation's management plan for the black-tailed prairie dog. The plan balances conservation with human health and property loss and details circumstances for lethal control of the species on Fort Carson.

Colorado Checkered Whiptail
The Colorado checkered whiptail species is only found in areas of southeastern Colorado (Walker *et. al.* 1997) and is currently being evaluated by USFWS for listing as a Candidate species under ESA. It is currently listed by CPW and USFWS as a species of special concern. The Colorado checkered whiptail habitat occurs in valleys, arroyos (dry creeks), canyons, and on hillsides, in areas dominated by plains grassland or juniper woodland, including areas such as parks with frequent human use and habitat disturbance (Walker et. al. 1997). Little is known about the whiptail on Fort Carson, except occurrence has been documented. Colorado checkered whiptail habitat occurs within the construction area and the SDZ area of both proposed Ranges.

Birds *(Birds of Conservation Concern, State threatened, endangered, or Species of Special Concern)* on Fort Carson have the potential for impacts during nesting season, which for most bird species on Fort Carson occurs 15 April-15 September.

Mountain Plover
The mountain plover is listed as a Species of Special Concern by the USFWS. Mountain plovers are rare on Fort Carson, and only a small percent of available habitat is occupied; Surveys for this species are conducted annually and it is not known to occur in or near the project area.

Burrowing Owl
The burrowing owl is listed as state threatened by CPW. The burrowing owl is a small, burrow-dwelling owl nesting underground in unoccupied prairie dog burrows. The burrowing owl is not abundant on Fort Carson and the number of prairie dog

colonies annually occupied by this species is low (Fort Carson, 2013). Although sylvatic plague does not directly influence nesting burrowing owls, they generally do not nest in colonies where all prairie dogs have been killed by plague. In 2011 this species was recorded nesting in a prairie dog town in the SDZ project area of existing Range 127.

Golden Eagle
Bald and golden eagle are protected under the Bald and Golden Eagle Protection Act (BGEPA) of 1940. There are two known Golden Eagle eyries within the SDZ of the proposed area of Range 127. The two eyries are in close proximity to each other. One nest/eyrie has been active 2008-2012 and 2015 and the other has not been active since 2007. In Colorado, golden eagles nesting period usually occurs 1 January-21 August.

Other Birds of Conservation Concern
An artificial owl nesting box occurs within the proposed area for Range 153. Great horned owls have nested in the box for several years and is currently active. Great horned owl nesting period usually occurs from 1 December-31 September and red-tailed hawks occurs 15 March-15 August. A red-tailed hawk nest occurs approximately 0.2 miles from the proposed area. The red-tailed hawk nest has been active for several years.

4.5.4 Wetlands
Wetlands and activities within them are regulated by Section 404 of the CWA administered by the US Army Corps of Engineers (USACE). There are no jurisdictional wetlands within the AOI of the Proposed Action, however there are small wetlands and narrow riparian ecosystems located in and along the Turkey Creek channel of the proposed IPBC Range 127. There are no significant wetlands within the proposed AOI of the Range 153 ISBC.

4.5.5 Environmental Consequences
4.5.5.1 IPBC
Vegetation
Invasive noxious weeds of several species have been noted in the drainage, mostly in the riparian edges of the Turkey Creek drainage and associated valley bottom. Specific to the proposed IPBC Range, there is a presence of invasive species of plants which include Spotted knapweed (Acosta maculosa), Diffuse knapweed (Centaurea diffusa), Houndstongue (Cynoglossum officinale), Common teasel (Dipsacus fullonum), Musk thistle (Carduus nutans), Common burdock (Arctium minus), Bouncingbet (Saponaria officinales), Canada thistle (Cirsium arvense), Puncture vine (Tribulus terrestris) and Downy brome (Bromus tectorum). There is the potential for noxious weed spread when disturbed, however the Proposed Action should not impact the drainage area, therefore anticipated impacts would be negligible.

Wildlife

Black-tailed Prairie Dog
Range 127 construction area has the potential to impact 31.90 acres of prairie dog colonies. However, the larger prairie dog colony currently experiences heavy military training from existing range exercises. The proposed construction of the ROCA and helipad may have impacts on the prairie dog colony at the north end of the construction area that is 16.15 acres in size. The remaining 133.05 acres of prairie dog town occurring in the SDZ area should not experience additional impacts from what they experience from current range exercises.

Colorado Checkered Whiptail
Potential Colorado checkered whiptail habitat could be impacted by the construction of Range 127. Other impacts to whiptail habitat that could occur are catastrophic fire events from training.

Birds (Birds of Conservation Concern, State threatened, endangered, or Species of Special Concern)
Mountain plover and burrowing owl habitat could be impacted during construction of Range 127 where prairie dog burrows are disturbed. Mountain plover, burrowing owl, and golden eagle could experience minor impacts in Range 127 SDZ area.
Birds, including grassland nesting birds protected under the MBTA and listed as USFWS Species of Special Concern may occur in the construction area and the SDZ area. Nesting birds protected under the MBTA, especially ground-nesting birds in grassland habitat could be impacted during construction of proposed range 127 and during training exercises. Minor impacts could occur in the SDZ area. Increased noise activity and inadvertent catastrophic fire caused by training exercises has the potential to have negative impacts. Federal Register-50 CFR Part 21 (RIN 1018-AI92), Final Rule, *Migratory Bird Permits; Take of Migratory Birds by the Armed Forces* allows the Armed Forces to take migratory birds as an incidental result of military readiness activities. This rule does not apply to construction of ranges.

Wetlands
Potential negative impacts to wetlands could occur due to construction and/or operation of the IPBC; however the wetlands are not within the construction footprint of the Proposed Action and Fort Carson must comply with the CWA and Section 404, so any potential impacts would be minimal and/or mitigated.

4.5.5.2 Range 153 ISBC
Vegetation
There is the potential for vegetation decline due to disturbance and a spread of invasive species, however periodic monitoring and management would prevent significant impacts from occurring.

Wildlife
The normal association of prairie wildlife and nesting grassland birds may be present, however the Fort Carson Wildlife Office would conduct surveys prior to initiation of the Proposed Action, and therefore impacts would be minimal.

Colorado checkered whiptail potential habitat could be impacted by the enlargement of Range 153. Other impacts to whiptail habitat that could occur are catastrophic fire events from training.

Range 153 proposed project should have negligible impacts on mountain plover, burrowing owl, and prairie dog.

Nesting birds protected under the MBTA, especially ground-nesting birds in grassland habitat could be impacted during the Range 153 ISBC and during training exercises. Minor impacts could occur in the SDZ area. Increased noise activity and inadvertent catastrophic fire caused by training exercises has the potential for negative impacts. Federal Register-50 CFR Part 21 (RIN 1018-AI92), Final Rule, *Migratory Bird Permits; Take of Migratory Birds by the Armed Forces* allows the Armed Forces to take migratory birds as an incidental result of military readiness activities. This rule does not apply to construction of ranges.

Wetlands
There are no significant wetlands within the proposed AOI, therefore impacts would be negligible.

4.5.5.3 No Action

Vegetation
Under the No Action Alternative, there would be no change to vegetation from the Proposed Action.

Wildlife
Under the No Action Alternative, there would be no change to wildlife from The Proposed Action.

Wetlands
Under the No Action Alternative, there would be no change to wetlands from the Proposed Action.

4.5.6 Cumulative Effects

Vegetation
Cumulative, long term impacts would possibly be more noticeable than the present, very limited use of these two footprints, but would still be classified as minor. Any decline in vegetation noted by periodic visual monitoring could be mitigated by reseeding native perennial grasses. Construction operations could potentially increase the spread of noxious weeds especially along the riparian edges of the Turkey Creek drainage. Maneuvers, especially those that involve tracer rounds and other pyrotechnics, increase the potential for wildfires.

Wildlife

The Proposed Action results in a variety of potential impacts, including mortality, disturbance or displacement, and loss of habitat or nesting or foraging territory. The Proposed Action includes continuation of a number of management measures, such as described in the INRMP and mitigations to avoid and minimize these impacts.

Cumulative impacts could occur with black-tailed prairie dog colony with Range 127 construction, however the town currently experiences heavy disturbance from military exercises as an active range.

If Colorado checkered whiptail is later listed as Candidate species under the ESA, potential impacts could occur in known habitat from military training at both proposed ranges. Future impacts should be minimal.

Wetlands
Cumulative impacts for the Proposed Action in combination with other present and planned future actions are and would continue to occur at Fort Carson and in the region. Fort Carson will continue to play a key role in sustaining wetlands through its land management and natural resources programs to minimize these impacts. Fort Carson must comply with the CWA and Section 404, so any potential impacts would be minimal and/or mitigated.

4.5.7 Site-specific Mitigation

Vegetation
Under Executive Order 13112 (1999), Fort Carson is dedicated to prevention of introduction of invasive species and strives to control populations and prevent spread. If the drainage way is to be disturbed during construction, prior coordination with the Invasive Plant Manager would assist in the prevention of potential weed spread. Permitted access when no training is scheduled, would allow for treatment and control of the spread of weeds.

To minimize the potential for wildfires at Range 127 and to enable a more fire resilient forest structure, several silviculture prescriptions could be employed. These include-prescribed burning, shaded fuel breaks, clear cuts and thinning. Specifically, these silviculture techniques would reduce the vertical fuel structure to help prevent crown fires and denude horizontal fuels to slow upslope fire spread. The creation of a fire break road would enable both an anchor point for wildfire mitigation projects and provide quicker access to combat wildfires. Figure 4.5 represents the approximate locations of the recommended silviculture prescriptions and the fire break for Range 127.

Wildlife
Black-tailed prairie dog towns impacted from construction of proposed Range 127 should be surveyed within two weeks prior to beginning work when temperatures are above 60°F.

Both proposed ranges would require surveys to evaluate the presence of nesting birds protected by the MBTA, to include mountain plovers and burrowing owls. All construction work should occur outside of bird nesting season, which typically occurs 15 April to 15 September for most bird species. Other raptor species such as owls and eagles start nesting in January. If construction work occurs during nesting season trees, shrubs, cattails, grassland vegetation should be removed, mowed, or graded prior to bird nesting season and continually kept in that manner until construction work begins. Otherwise, clearing surveys need to be conducted by wildlife biologists.

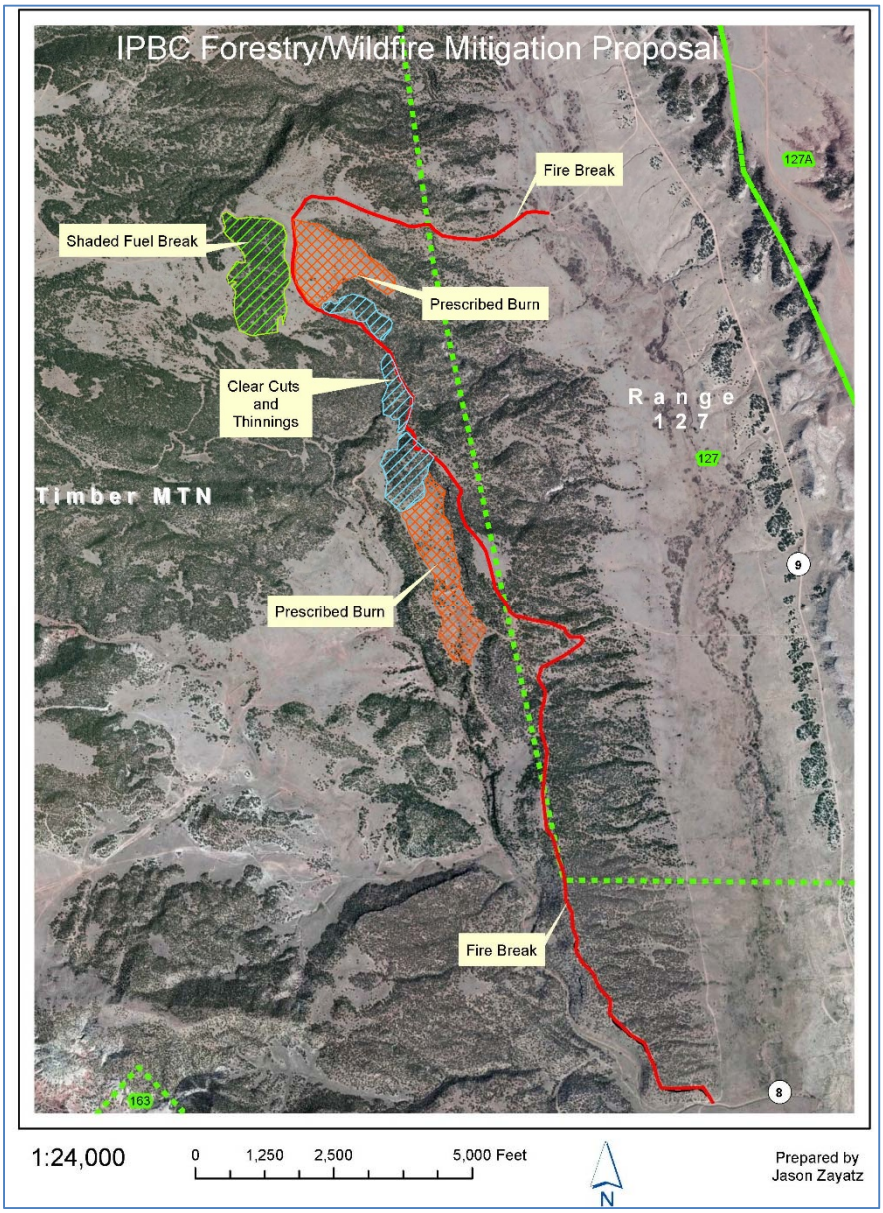

Figure 4.5 Proposed Silviculture Prescriptions and Fire Break for Range 127.

Ground nesting birds found should have a no-disturbance buffer of 50 feet, golden eagles buffer is 0.5 mile and burrowing owl buffer is 0.25 miles. If any bird species is found nesting, the proponent must consult the Fort Carson wildlife biologist for USFWS guidance on buffer protection zone sizes.
Prior coordination with Fort Carson's Wildlife Office would be necessary to survey the project area for MBTA nests within 2 weeks of construction start.

Training exercises at both ranges would need to do so in accordance with 50 CFR Part 21 final ruling. The Armed Forces will adopt, to the maximum extent practicable, conservation measures designed to minimize and mitigate any adverse impacts of authorized military readiness activities on affected migratory bird species. The term ''to the maximum extent practicable'' means without limiting the subject readiness activities in ways that compromise the effectiveness of those activities, and to the extent economically feasible. As the basis for this rule, under the authority of the MBTA and in accordance with Section 315 of the Authorization Act, the Armed Forces will consult with the USFWS to identify measures to minimize and mitigate adverse impacts of authorized military readiness activities on migratory birds and to identify techniques and protocols to monitor impacts of such activities.

Proactive measures to assess the Colorado checkered whiptail with the possible listing by USFWS would allow future impacts to be identified. Whiptail occurrence/presence and habitat should be identified and mapped. Studies should be conducted to evaluate and determine habitat preference and selection along with other pertinent surveys (e.g., presence and abundance studies).

Wetlands
Continued compliance with the CWA and Section 404.

4.6 Cultural Resources

4.6.1 Existing Conditions

Cultural resources are the non-renewable remnants of past human activities that have cultural or historical value and meaning to a group of people or a society. The term "cultural resources" includes *historic properties*, as defined by the National Historic Preservation Act (NHPA); *cultural items*, as defined by the Native American Graves and Repatriation Act (NAGPRA); *archaeological resources*, as defined by the Archaeological Resources Protection Act; *sacred sites*, as defined in EO 13007, to which access is afforded under American Indian Religious Freedom Act (AIRFA); and *collections*, as defined in 36 CFR Part 79, *Curation of Federally-owned and Administered Archaeological Collections*.

As of March 2016, approximately 99,640 acres of Fort Carson's 137,404 acres have been surveyed for cultural resources, resulting in the recordation of 2,371 buildings, archaeological sites, and isolated finds (IFs), representing every period of human occupation from the Paleoindian stage to the present.

Through consultation with the Colorado State Historic Preservation Officer (SHPO), Native American Tribes, other consulting parties, and the public, Fort Carson has implemented two programmatic agreements (PAs) for compliance with Section 106 of the NHPA: 1) Regarding Construction, Maintenance, and Operational Activities for Select Areas on Fort Carson (Built Environment PA), executed on 27 March 2013; and 2*)* Regarding Military Training and Operational Activities Occurring Down Range Fort Carson (FC Down Range PA), executed on 31 March 2014.

Fort Carson consults with 13 federally-recognized Tribes, who have a cultural affiliation with Fort Carson lands. A comprehensive Agreement between Fort Carson and 10 Tribes for tribal access, privacy, and inadvertent discovery of human remains and other cultural items was executed in 2004, and a second comprehensive agreement with the Jicarilla Apache Nation was signed in 2005.

4.6.2 Environmental Consequences

4.6.2.1 IPBC

Currently, there are 212 archaeological sites and isolated finds (IFs) located within the proposed areas of potential effects (APEs), which includes the existing Range 127 footprint and the surface danger zones (SDZs), for the new IPBC Range. Of that number, 200 sites have been officially determined to be ineligible for inclusion in the National Register of Historic Places (NRHP) and are of no further concern to this action. In accordance with the FC Down Range PA, five of the sites have been designated for offset mitigation through measures described in Stipulation VI, Section B of the Down Range PA. Seven sites located within the APEs for the Proposed Action are protected properties, as designated in Appendix 2 of the FC Down Range PA. In accordance with Stipulation III, Section D, no vehicle of any kind may be operated within the boundaries of these sites, except for rescue and salvage operations conducted to preserve life and property.

In accordance with the FC Down Range PA, the type of military training that will occur as a result of the Proposed Action is exempt from further Section 106 consultation (Appendix 1.A). In addition, construction activities occurring within the existing Range 127 footprint are considered exempted undertakings (Appendix 1.D.1). Construction activities outside of an existing range footprint are not considered an exempted undertaking; therefore, Section 106 consultation with the SHPO and other consulting parties was completed on 27 May 2015 for the APE for the construction of the proposed Range Operations Control Area (ROCA) and Objective A, both of which are located outside the existing Range 127 footprint. The SHPO has concurred with Fort Carson's determination of “no adverse effect to historic properties” pursuant to 36 CFR 800.5(b). No other comments were received. Section 106 correspondence is included in Appendix F.

4.6.2.2 Range 153 ISBC

Of the five sites located within the proposed APEs, four are officially ineligible for inclusion in the NRHP and are of no further concern to this action. One site, 5EP00077,

is currently classified as officially “needs data” (SHPO correspondence dated 5/8/2014 [CHS #65068]), but lies outside the construction and maneuver APEs for the ISBC.

In accordance with the FC Down Range PA, the type of military training that will occur as a result of the Proposed Action is exempt from further Section 106 (Appendix 1.A). Construction activities that will occur within the existing Range 153 footprint are also exempt from further Section 106 consultation (Appendix 1.D.1). Since construction of the ISBC extends outside of the existing footprint for Range 153, Section 106 consultation on the effects of expanding Range 153 was conducted. On 9 October 2015, the SHPO concurred with Fort Carson’s determination of “no historic properties affected” pursuant to 36 CFR 800.4(d)(1). Concurrences were also received from the Comanche Nation and the Tatanka Group. No other comments were received. Section 106 correspondence is included in Appendix F.

4.6.2.3 No Action Alternative

There would be no change in the existing conditions of cultural resources under the No Action Alternative.

4.6.3 Cumulative Effects

The training associated with the Proposed Action and other Fort Carson training could cause damage to cultural resources. By following the stipulations in the FC Down Range PA, it is anticipated that no significant adverse cumulative impacts to cultural resources would be caused as a result of this Proposed Action. Due to the use of above-ground construction methods and renewable energy practices, ground disturbance is expected to be minimal. However, Fort Carson’s Inadvertent Discovery of Archaeological, Cultural, or Paleontological Materials Standing Operating Procedure (SOP) will apply for construction and training activities.

4.6.4 Site-specific Mitigation

Fort Carson will ensure that appropriate protection measures are in place for the seven historic properties within the APE, in accordance with Stipulation III of the FC Down Range PA. These measures may include physical protection (e.g. Seibert markers, fencing or boulders), inclusion on all digital mapping systems, and/or other administrative actions. Monitoring of these sites will continue as indicated in Stipulation IV of the PA.

4.7 Noise

4.7.1 Existing Conditions

Sources of noise associated with Fort Carson include military training operations, aircraft, and traffic. Military sources of noise include weapons firing and tactical vehicle and aircraft operations. Other sources of noise include motor vehicle traffic (for example, cars and trucks) and construction activities.

Army Regulation (AR) 200-1 delineates noise generated by military operations into four zones, each representing an area of increasing decibel (dB) level. The AR lists housing, schools, and medical facilities as examples of noise-sensitive land uses. The

zone designations are used to determine if the noise environment is compatible with noise-sensitive land uses, as illustrated in Table 4.7-1. The Land Use Planning Zone is a subset of the Zone 1 planning zone and is 5 dB lower than Zone II dB levels.

Table 4.7-1. Noise Zone Descriptions

Noise Zone	Aviation (ADNL)	Small Arms (PK15(met))	Large Arms, Demolitions, Etc.(CDNL)	Noise-sensitive Land Use Compatibility
Land Use Planning Zone (LUPZ)	60-65 dB	N/A	57 – 62 dB	Acceptable
Zone I	<65 dB	<87 dB	<62 dB	Acceptable
Zone II	65-75 dB	87 – 104 dB	62 – 70 dB	Normally Not Recommended
Zone III	>75 dB	>104 dB	>70 dB	Never Recommended

Several metrics are used to describe the noise level of military operations. Day-Night Level (DNL) is the 24-hour average frequency-weighted sound level, in decibels, from midnight to midnight, obtained after the addition of a "penalty" of 10 decibel dB to sound levels of noise occurring between midnight and 7 a.m. and between10 p.m. to midnight (0000 to 0700 hours and 2200 to 2400 hours). The DNL may be A-weighted (ADNL), which is the DNL weighted to correspond with the non-linear sensitivity of the human ear. A-weighting is used most often for higher frequency sounds and is used to measure most common military sounds such as transportation and small-arms fire. C-weighting (CDNL) is another sound level weighting technique that is used to normalize the low, impulsive sounds to the range of human hearing. It is used when measuring low frequency sound such as those from large arms, demolitions, and sonic booms.

PK15 (met) is the peak sound level that is likely to be exceeded only 15% of the time (i.e., 85% certainty that sound will be below this level), after factoring in statistical variations caused by weather. This sound level exists only in modeling—one cannot take a PK15(met) reading on the ground—and it is used for land use planning with small arms and as additional information for large arms and other impulsive sounds.

AR 200-1 lists housing, schools, and medical facilities as examples of noise-sensitive land uses. Noise-sensitive areas adjacent to Fort Carson include Cheyenne Mountain State Park to the west; Colorado Springs to the north and west; and Security, Widefield, and the City of Fountain to the east. Other noise sensitive areas include Turkey Canyon Ranch and Red Rock Valley Estates along the western boundary and El Rancho and Midway Ranch along the eastern boundary. Noise-sensitive locations near the southern boundary of Fort Carson include the communities of Penrose and Pueblo West, which are located to the southwest and southeast, respectively. Noise-sensitive areas within Fort Carson are primarily located within the Main Post area, which is where a majority of Family housing, schools, office space, and child development centers are located. The primary sources of noise at Fort Carson are the firing of weapons, specifically large-caliber weapons, such as artillery and tank main guns, as well as the operations of military aircraft at BAAF.

An operational noise assessment was performed by the U.S. Army Public Health Command in June 2015 (Appendix G). Figure 4.7.1 depicts baseline noise levels due to existing demolition and large caliber operations including combat aviation activity noise contours for Fort Carson. The LUPZ (57 C-weighted day-night average level [CDNL]) extends beyond the eastern boundary beyond I-25, encompassing El Rancho, Midway Ranches, and the City of Fountain. The LUPZ extends into an undeveloped area to the south and beyond the western boundary encompassing Turkey Canyon Ranch. Zone II (62 CDNL) extends into El Rancho and Midway Ranches; and slightly into the Turkey Canyon Ranch. Zone III (70 CDNL) extends slightly into undeveloped areas of Fountain, El Rancho, and Turkey Canyon Creek. On-post Zone II encompasses most of the Wilderness Road Complex.

Figure 4.7.1.2 depicts the existing conditions for small caliber noise within the Area of Interest for Range 153.

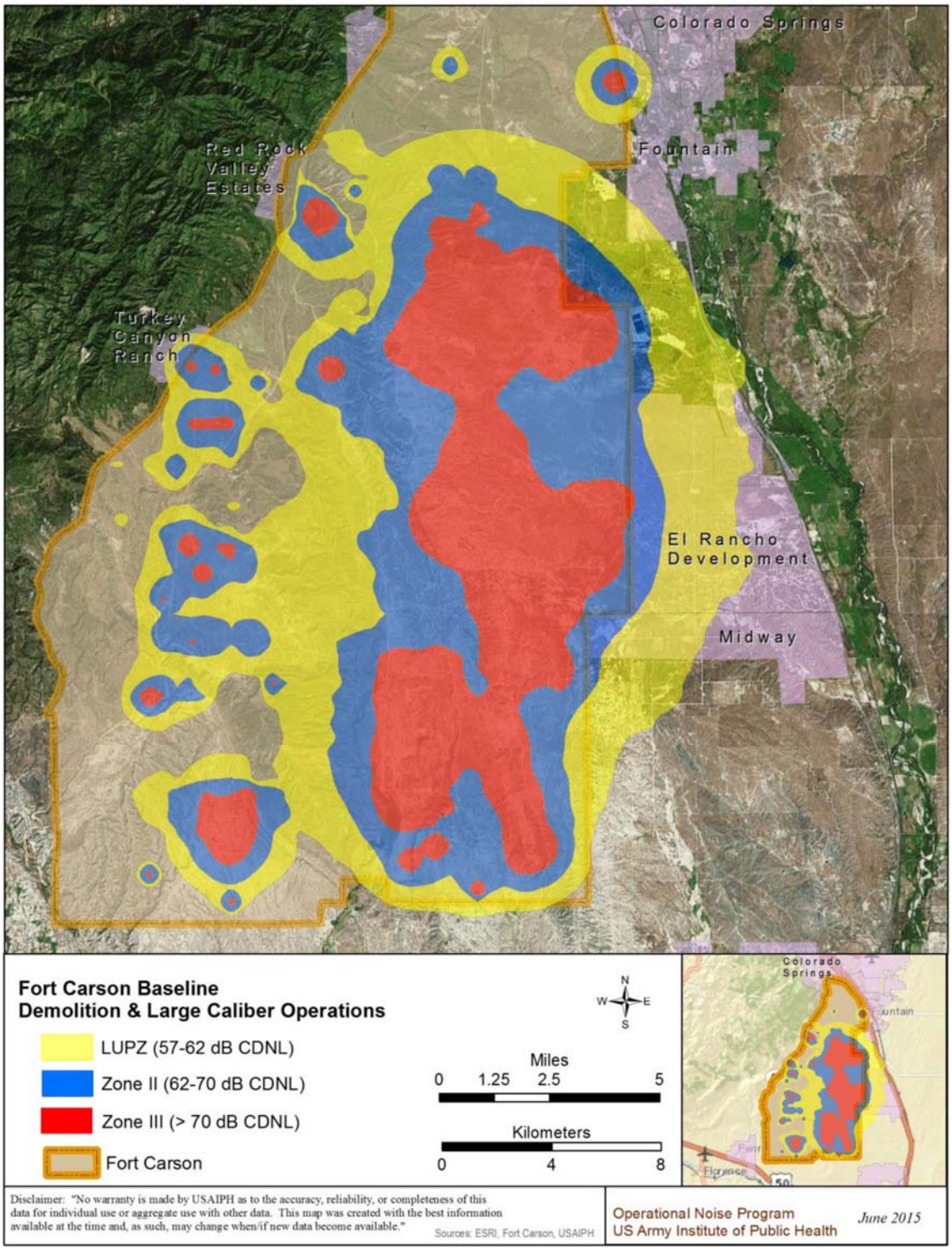

Figure 4.7.1. Fort Carson Large Caliber Noise Contours for Existing and CAB Activity

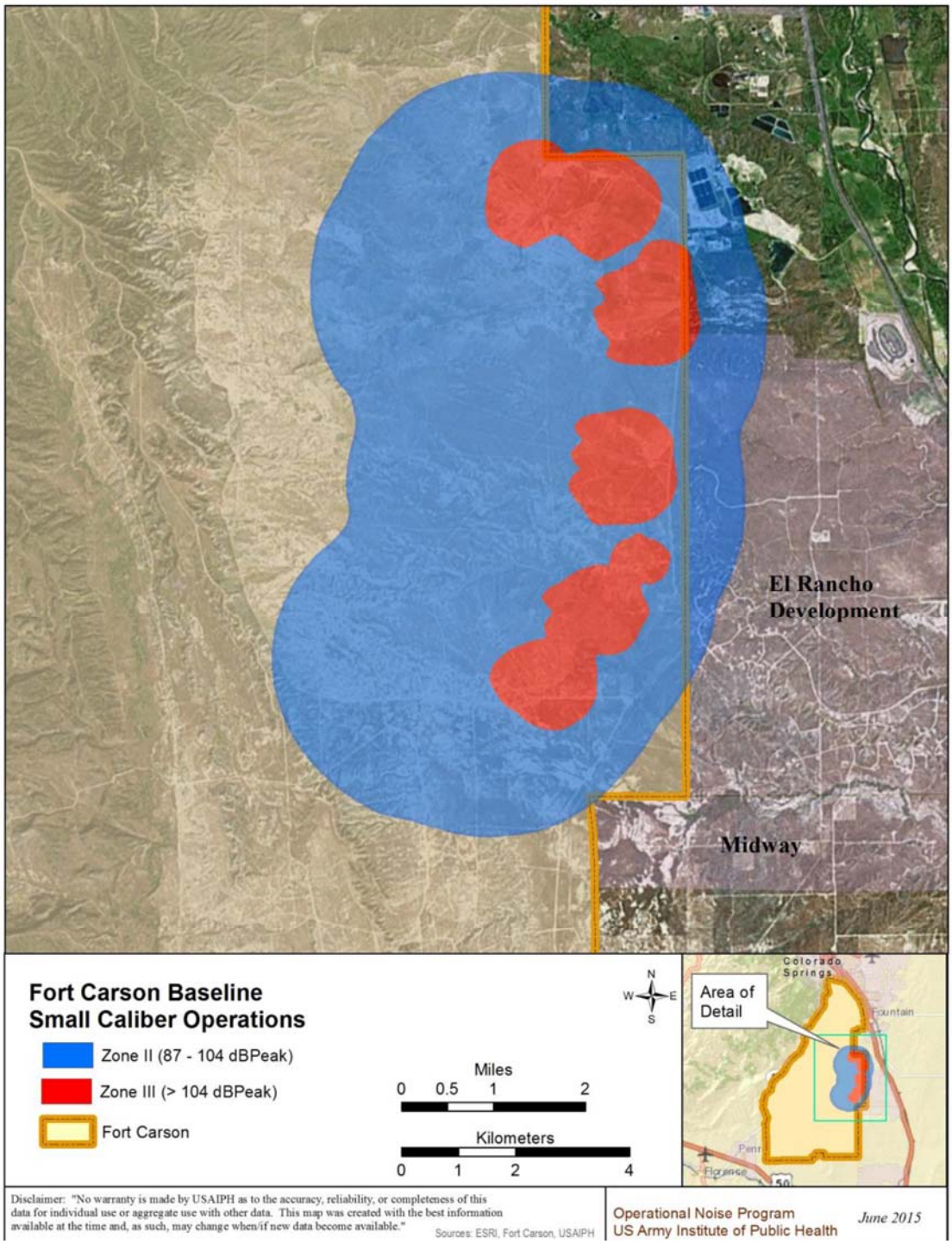

Figure 4.7.1.2. Small Caliber Noise Zones Baseline Conditions

4.7.2 Environmental Consequences

Factors considered in determining whether an alternative would have a significant effect are the extent to which its implementation would generate temporary noise during construction or long-term noise during operation and maintenance that would exceed DoD or applicable regulatory standards.

4.7.2.1 IPBC

Due to the remote area of Range 127, small caliber weapon noise was not evaluated because the noise remains within a few kilometers of the range. The proposed IPBC increases the size of the Zone II and Zone II noise levels within the installation. The proposed IPBC does increase noise levels outside of the installation.

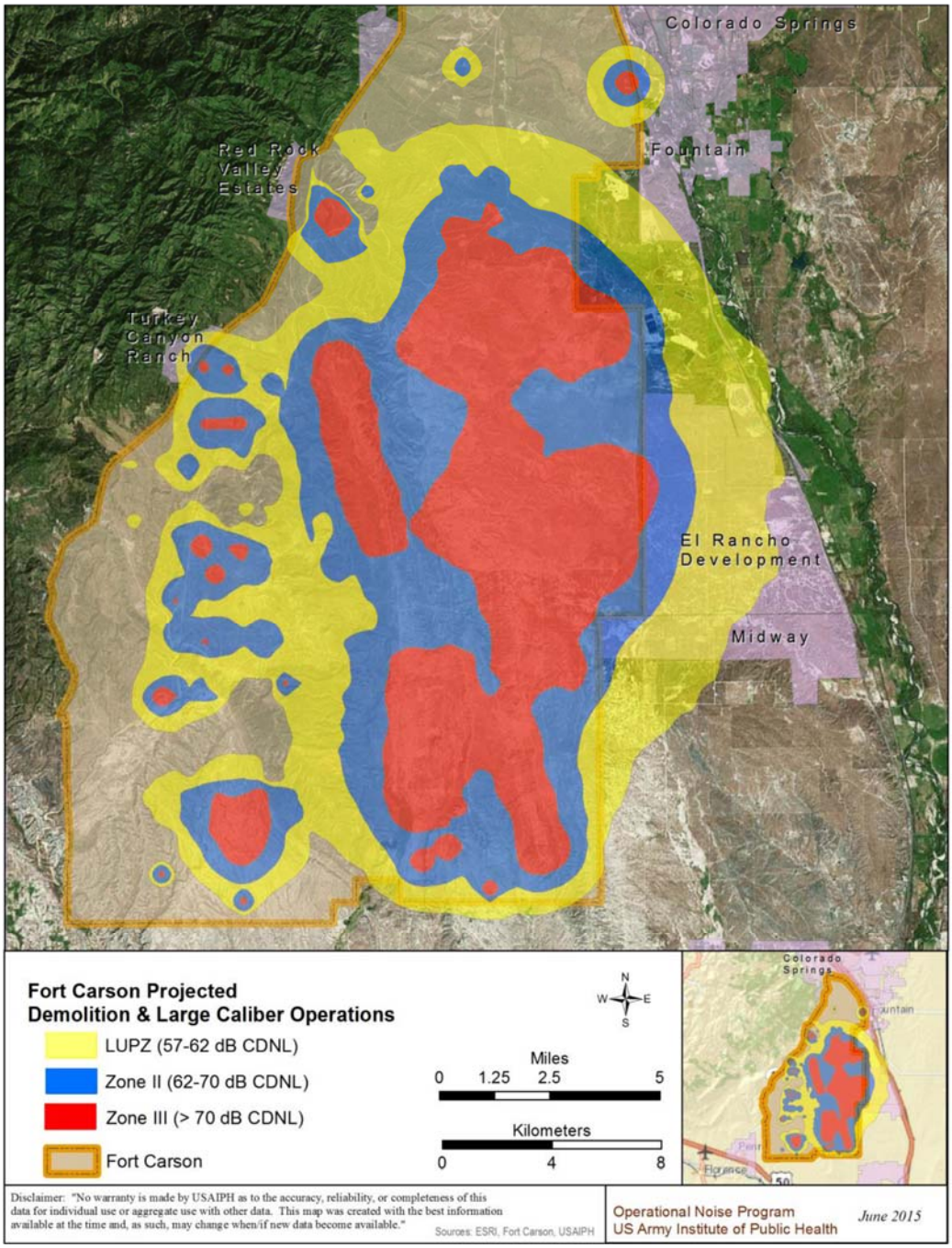

Figure 4.7.2. Large Caliber Projected Conditions Noise Zones*

**Eastern boundary projected noise zones include large caliber and demolitions for an alternative that is no longer being considered.*

4.7.2.2 Range 153 ISBC

Under the Proposed Action, demolition and large caliber operations will not occur at Range 153. Only small caliber operations (.50 caliber and below) are proposed for this range extension. The extent of Zone II noise levels would increase slightly outside of the installation, with no changes off-post for Zone III (see Figure 4.7.2).

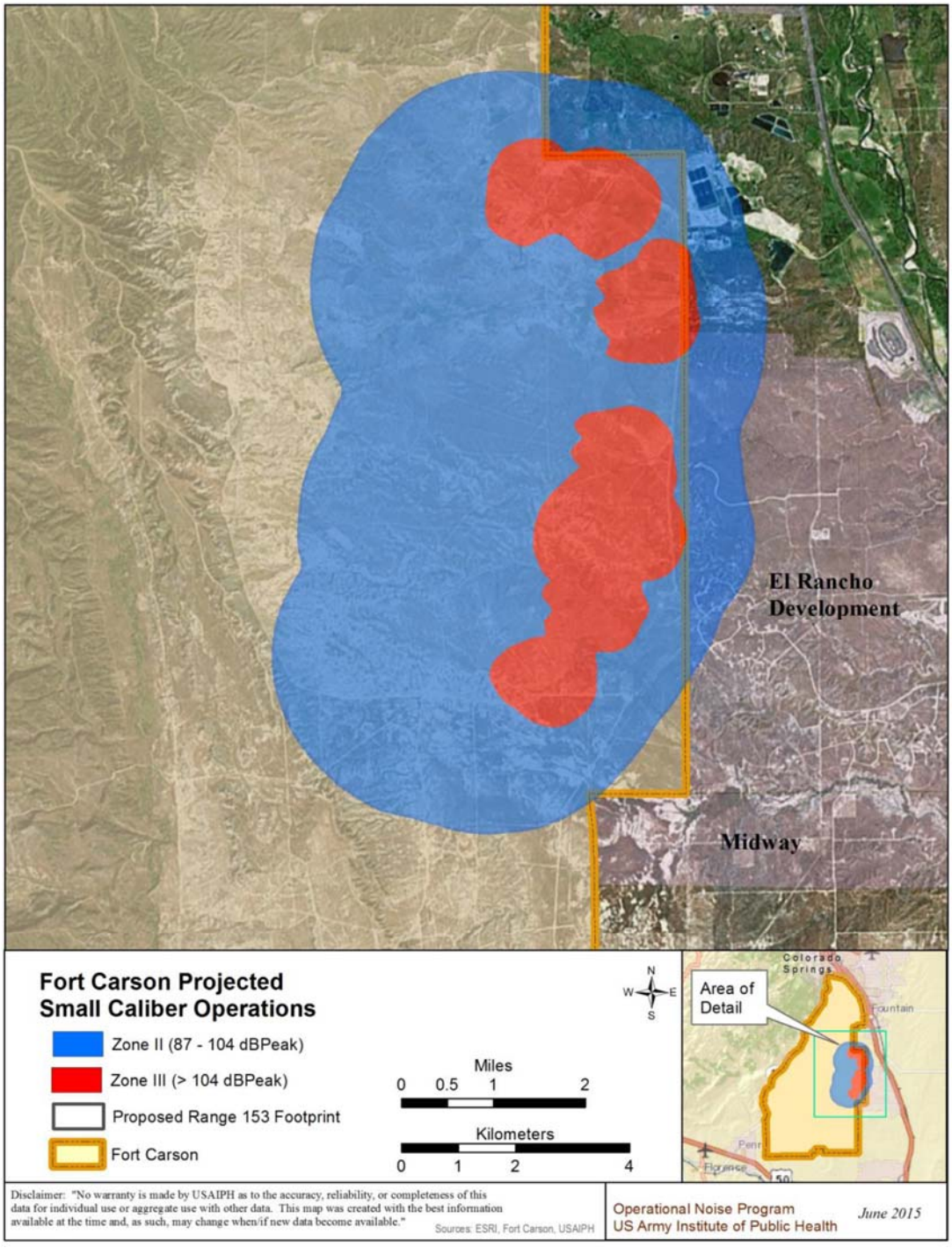

Figure 4.7.2. Small Caliber Noise Zones Projected Conditions

4.7.2.3 No Action Alternative
Under the No Action Alternative, there would be no change to noise levels than what currently exist.

4.7.3 Cumulative Effects
Cumulative effects of future operations of the IPBC and the ISBC on the total noise environment of the installation are minor. The noise assessment determined only minor increases of Zone II noise levels off-post; however, noise heard in the El Rancho Development will only be an increase in the frequency of small caliber weapons. No additional increase in noise due to large caliber and demolition operations will occur off-post.

4.7.4 Site-specific Mitigation
The installation complies with the Fort Carson Installation Operational Noise Plan (July 2012), which was produced by the Operational Noise Program of the U.S. Army Public Health Command (USAPHC.) Compliance with the Fort Carson Installation Operational Noise Plan will help mitigate against any cumulative impacts of noise from past, present, and the reasonably foreseeable future on immediate and surrounding communities.

Fort Carson maintains a noise complaint hotline to maintain a positive relationship with the neighboring communities. The phone number for this hot line is 719-526-9849 during business hours or 719-526-3400 after normal business hours.

5.0 SUMMARY OF EFFECTS AND CONCLUSIONS

5.1 Unavoidable Adverse Effects Should the Proposed Action Be Implemented
Some adverse effects due to construction cannot be avoided if the Proposed Action is implemented. Disturbance of soils and vegetation would occur, and these effects would be cumulative and long-term. There is a potential to impact US jurisdictional waters and/or wetlands, however Section 404 of the CWA is required to minimize the potential impacts. There would be no effects to federal- or state-listed species. Noise effects of the range operation would not be significant off the installation. There is a minimal potential for the generation or discovery of hazardous waste or materials; such waste or materials would be disposed of or remediated according to compliance requirements.

Table 5.1 summarizes potential effects for each alternative, after mitigation. Environmental effects would not be significant within the larger geographic and temporal context in which they would take place.

Table 5.1. Summary of Potential Environmental Consequences

Resource Area	Environmental Consequence”	
	No Action Alternative	Proposed Action

Air Quality	No effect	Negative during construction, undetectable effects during operation
Soils	No effect	negative, but mitigatable
Water Resources	No effect	Slightly negative, but mitigatable
Biological Resources	No effect	negative, but mitigatable
Wetlands	No effect	Slightly negative, but mitigatable
Cultural Resources	No effect	Slightly negative, but mitigatable
Noise	No effect	Slightly negative

* No effect: Actions have no known demonstrated or perceptible effects
Negative: Actions have apparent negative effects

5.2 Irreversible and Irretrievable Commitments of Resources

The Proposed Action would involve no irreversible or irretrievable commitment of resources other than the consumption of various expendable materials, supplies, and equipment associated with construction and operations and implementation of environmental mitigation measures.

5.3 General Mitigation

Fort Carson is committed to sustaining and preserving the range environment. In keeping with that commitment, the Installation has an active environmental management program that employs a full array of best management practices (BMPs) and environmental management programs to ensure environmental compliance, stewardship, and sustainability of those areas potentially impacted by this action. In this case, substantial mitigation has been incorporated into the design of the proposed courses and their supporting range infrastructure in order to achieve environmentally preferable outcomes, as described in the site-specific mitigation sections, above.

Additionally, the existing environmental staff and programs represent a current and foreseeable resource for stewardship and for implementation of existing plans and best practices, including implementation of fugitive dust controls measures, the Stormwater Pollution Prevention Plan (SWPPP), the Operational Noise Plan, the Programmatic Agreements for historic preservation, a prescribed burning program, and wildlife surveys and management. Additionally, the Installation's land management and restoration staff represent an in-place and funded resource for implementation and monitoring of the effects of land use and the effectiveness of restoration programs. They are a monitoring and enforcement capability which is currently funded and for which continued funding will be sought and for which the anticipated necessary funding is expected to be available.

5.4 Conclusions

The Proposed Action to extend Range 153 to incorporate an ISBC and to construct and operate an Infantry Platoon Battle Course at Range 127 on Fort Carson was analyzed by comparing potential environmental consequences against existing conditions. Findings indicate that implementation of the Proposed Action would result in no significant adverse environmental consequences. The affected environment

would not be significantly or adversely effected by proceeding with the Proposed Action. No significant cumulative effects would be expected with implementation of mitigation.

Based on this environmental assessment, implementation of the Proposed Action (*i.e.*, construct and operate the IPBC and Range 153 ISBC) would have no significant negative environmental or socioeconomic effects. Satisfaction of the Army's significant need to provide up-to-date and realistic training at Fort Carson is considered to outweigh the relatively minor environmental impacts, and significant damage mitigation would occur before and during range operation. The Proposed Action does not constitute a major federal action significantly affecting the quality of the human environment. Therefore, preparation of an environmental impact statement is not required, and preparation of a Finding of No Significant Impact is appropriate.

6.0 PERSONS CONTACTED

Name	Installation/ Affiliation	Role
Altepeter, Lana	Fort Carson/ Environmental (ENV)	Air Program Manager (PM)
Allen, Rebekah	Fort Carson/ENV	IRP Assistant
Benford, James	Fort Carson/ DPTMS	Plans, Training, Mobilization, and Security (PTMS), Director
Buccambuso, Emma	Fort Carson/DPW	Noise Program Manager
Camp, Mike	Fort Carson/DPTMS	Range Control Deputy
Clark, Scott	Fort Carson/DPW	Energy Program Coordinator
Davis, Bert	Fort Carson/DPTMS	Range Control Officer
Dunker, Eric	Fort Carson/ENV	Water Program Support Specialist
Gallegos, Joseph	Fort Carson/ENV	Compliance Branch Chief
Goss, Brian	Fort Carson/ENV	Natural Resource Specialist
Gray, Danny	Fort Carson/ENV	Installation Arborist
Guthrie, Vincent	Fort Carson/DPW	Utility PM
Haflett, Jack	Fort Carson/DPW	NEPA Coordinator
Hennessy, William	Fort Carson/SJA	Environmental Law Specialist
Hooper, William	Fort Carson/ DPTMS	Chief of Training
Kelley, David	Fort Carson/ENV	HazWaste/Mat PM
Kulbeth, James	Fort Carson/ENV	Sec 404/Watershed PM
Linn, Jeff	Fort Carson/ENV	Natural Resources Branch Chief
Martin, David	Fort Carson/ENV	Asbestos/Lead/Radon PM

Miller, Pamela	Fort Carson/ENV	Cultural Resources PM
Noonan, Harold	Fort Carson/ENV	Wastewater PM
Peyton, Roger	Fort Carson/ENV	Wildlife Biologist
Rohrs, Suzanne	Fort Carson/ENV	Stormwater PM
Smith-Froese, Stephanie	Fort Carson/ENV	Wildlife Biologist
Thomas, Wayne	Fort Carson/ENV	NEPA/Cultural Branch Chief
Whiting, Betty	Fort Carson/ENV	Archaeologist
Wiersma, Thomas	Fort Carson/DPW	Community Planner
Zayatz, Jason	Fort Carson/DPW	Installation Forester

7.0 REFERENCES

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8.0 ACRONYMS

Acronym	Definition
AAR	After Action Report
ADNL	A-weighted Day Night Average Noise Level
AOI	Areas of Interest
APE	Area of Potential Effects
AR	Army Regulation
AST	Aboveground Storage Tank
BMPs	Best Management Practices
CAA	Clean Air Act
CDPHE	Colorado Department of Public Health and Environment
CDNL	C-weighted day-night average level
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CGP	Construction General Permit
CO	Carbon Monoxide
CO2	Carbon Dioxide
CWA	Clean Water Act
dB	Decibel
EA	Environmental Assessment
EC	Erosion Control
EIS	Environmental Impact Statement
EO	Executive Order
FNSI	Finding of No Significant Impact
Ft^2	Square Feet

GHG	Green House Gas
IFs	Isolated Finds
IHFS	Infantry Hostile Fire Simulator
IPBC	Infantry Platoon Battle Course
ITAM	Integrated Training Area Management
LEDs	Light-Emitting Diodes
LUPZ	Land Use Planning Zone
LZ	Landing Zone
MAT	Moving Armor Target
METL	Mission Essential Task List
MGB	Machine Gun Bunker
MILES	Multiple Integrated Laser Engagement System
MIT	Moving Infantry Target
NAAQS	National Ambient Air Quality Standard
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	Night Muzzle Flash Simulator
NOA	Notice of Availability
NOI	Notice of Intent
NOx	Nitrogen oxide
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NSR	New Source Review
PCMS	Piñon Canyon Maneuver Site
PEA	Programmatic Environmental Assessment
PM	Particulate Matter
PRTCI	Properties of Religious, Traditional, and Cultural Importance
ROCA	Range Operation Control Area
SAT	Stationary Armor Target
SDZ	Surface Danger Zone
SIT	Stationary Infantry Target

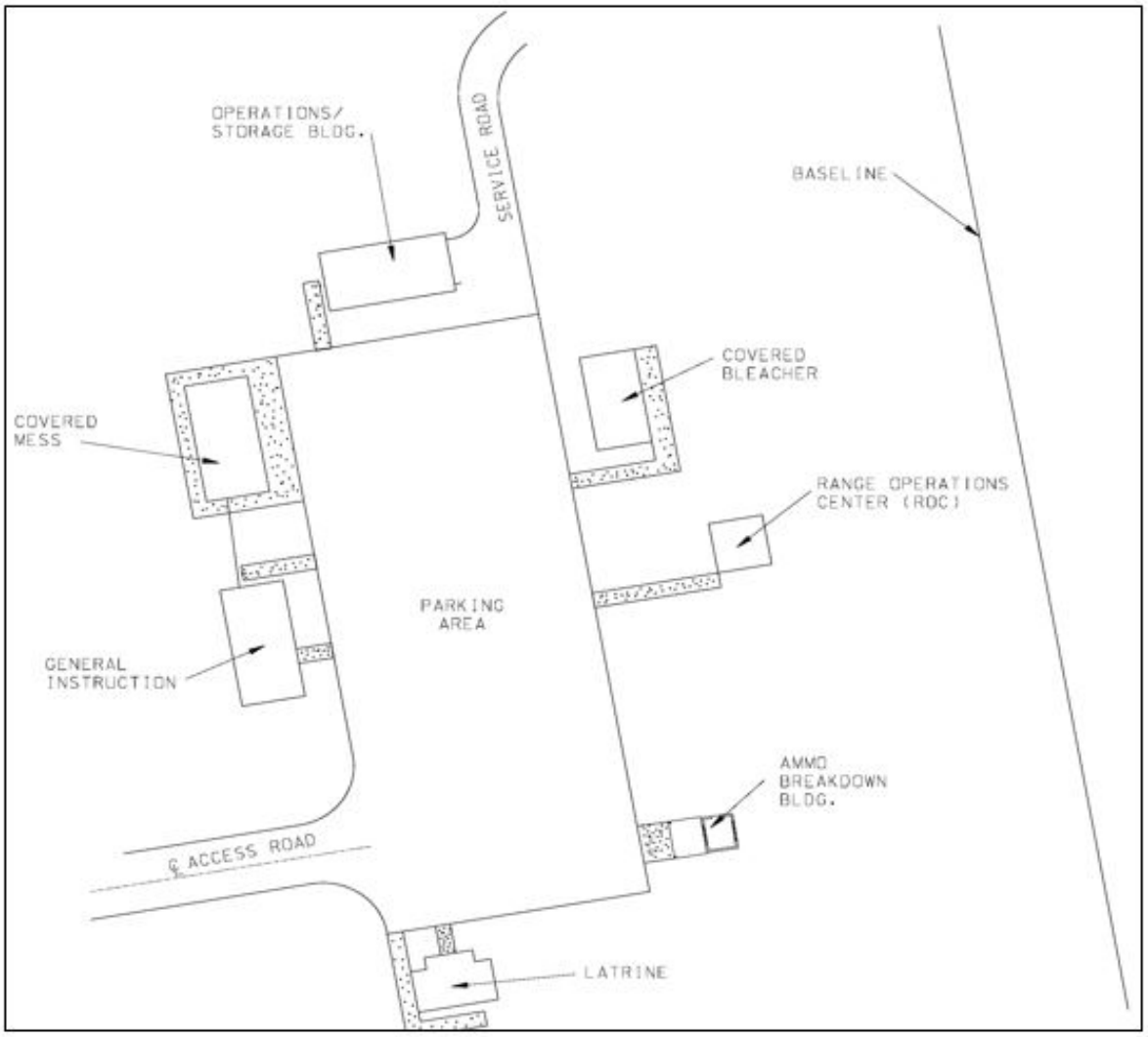
SO2	Sulfur Dioxide
SOP	Standard Operating Procedure
SWMP	Stormwater Management Plan
SWMU	Solid Waste Management Unit
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traditional Cultural Places
USACE	US Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UXO	Unexploded Ordnance
µm	Micrometers
VEC	Valued Environmental Component
WWTP	Wastewater Treatment Plant

APPENDIX A – Comments Received and Responses

No public comments were received.

APPENDIX B – IPBC Layout Details

STANDARD SMALL ARMS RANGE OPERATIONS AND CONTROL AREA FACILITIES



The Range Operation Center and Operations/Storage Building are used to operate and maintain the range. The Bleacher Enclosure and General Instruction Building are used for pre and post event instruction. The remaining buildings are to support the training or the troops being trained.

Associated Range Operations and Control facilities:
Range Operations Center
Small Operations/Storage Building
General Instruction Building
Latrine

APPENDIX C – Alternative Analyses for Proposed IPBC at Range 127.

Alternative Analysis A Range 155

#	Question	Answer			
		Yes	No	Yes but constrained	Explanation
1	Does this alternative meet the mission requirements of units that train on the installation?		X		Impacts other ranges, environmental concerns and mitigation would be cost prohibited
2	Can the Army standard design in TC 25-8 for this range be accommodated under this alternative within allowable waivers or modifications?	X			
3	Can the Surface Danger Zone (SDZ) for this range be accommodated without infringing on adjacent training facilities, ranges, or areas outside the installation boundary?	X			
4	Will all dud producing munitions from this alternative be contained within existing dudded impact area?		X		No dud producing ammunition will be shot on this range
5	Has the range been sited to maximize use of the installation range complex for future range requirements by leaving the maximum amount of suitable contiguous land mass available for future ranges?	X			
6	Does the installation have sufficient airspace (SUA, MOA, SARSA) and an Approval Letter from a FAA Controlling Authority. A copy is	X			

	provided in the GIS file area.				
7	Can this range be sited on another existing or to be constructed range and the two meet annual training requirements?			X	Alternate site is a current range and would hinder throughput on the existing range for live fire due to SDZ's. Annual requirements would not be meet if alternate site was used only.
8	Provide other mission impact factors:				Fort Carson unit commanders have requested that the IPBC ranges be located in challenging terrain that is similar to conditions encountered in the contemporary operating environment. Alternate site will cause scheduling issues with other ranges.
9	Provide mission summary:				This complex is used to train and test infantry platoons, either mounted or dismounted, on the skills necessary to conduct tactical movement techniques, detect, identify, engage and defeat stationary and moving infantry and armor targets in a tactical array
10	Will less than 10,000 feet of electrical power line be required for this alternative?	X			
11	Will less than 10,000 feet of fiber optic cable be required for this alternative?	X			
12	There is no requirement for water lines, a well, or leech field to be constructed for this alternative.	X			
13	Has a UXO survey been conducted on this site?	X			
14	Does this alternative minimize construction costs for the range?		X		It will cost the same amount at either site.
15	Has a line of sight analysis (GIS	X			

	Preliminary) of this site been conducted?				
16	Does this alternative impact any federally listed T & E species or T & E species habitat?		X		
17	Does this alternative impact any candidate species, species specially managed by the installation, or state listed species which the installation manages for?	X			Potential impact to burrowing owl and other USFWS bird species of special concern due to construction. Would require mitigation recommendations/ BMPs.
18	Does this alternative impact any cultural sites (including historic structures, buildings, archeological sites or properties of traditional, religious or cultural significance)?	X			Potential for Cultural Resources. Section 106 would be required for alternate site.
19	Does this alternative impact on any Native American treaty rights or agreements?		X		
20	Does this alternative impact any jurisdictional water of the US to include jurisdictional wetlands?	X			Young Hollow Watershed and County Line Watershed
21	Does this alternative have an impact on surface water quality?		X		
22	Will this alternative have noise impacts on the civilian sector outside the installation boundary?	X			Current range is impacting civilian sector. IPBC would have a smaller footprint in noise modeling.
23	Will this alternative potentially have noise impacts on military housing or other sensitive on post facilities (hospital,		X		

	childcare facility, on post school)?				
24	Do noxious weeds/invasive species impact this alternative?		X		
25	Is the installation in a non-attainment or maintenance area for clean air?	X			
26	Provide other environmental impact factors:				Stormwater runoff, Migratory Bird Treaty Act

COMMENTS/ CONSIDERATIONS:
Primary site has the least amount of impact to other training facilities, environment and throughput requirements for unit training.

The alternate site is currently a Combined Live Fire Exercise (CALFEX Range 155) range. The Division uses this range for Table XII exercises for company live fire exercises. The Scout/Recce Range (Range 145) and the Digital Multi-Purpose Range Complex (DMPRC Range 143) SDZ for Tanks and Bradley's shoot into Range 155. This range is earmarked for another IPBC in the future. Fort Carson has a delta of 3 IPBC's for units assigned.

Alternative Analysis B (Preferred Alternative) Range 127

#	Question	Answer			
		Yes	No	Yes but constrained	Explanation
1	Does this alternative meet the mission requirements of units that train on the installation?	X			This alternative would provide the terrain challenges requested by unit commanders.
2	Can the Army standard design in TC 25-8 for this range be accommodated under this alternative within allowable waivers or modifications?	X			
3	Can the SDZ for this range be accommodated without infringing on adjacent training facilities, ranges, or areas outside the installation boundary?			X	This alternative would prevent the use of maneuver training areas that are frequently shut down for large caliber training on other ranges.
4	Will all dud producing munitions from this alternative be contained within existing dudded impact area?				Not Applicable No dud producing munitions will be used.
5	Has the range been sited to maximize use of the installation range complex for future range requirements by leaving the maximum amount of suitable contiguous land mass available for future ranges?	X			
6	Does the installation have sufficient airspace (SUA, MOA, SARSA) and an Approval Letter from a FAA Controlling Authority. A copy is provided in the GIS file area.	X			Restricted airspace R2601

7	Can this range be sited on another existing or to be constructed range and the two meet annual training requirements?		X		Anticipated utilization rate of this range will prevent dual use potential
8	Provide other mission impact factors:				Fort Carson unit commanders have requested that this IPBC range be located in challenging terrain that is similar to conditions encountered in the contemporary operating environment.
9	Provide mission summary:				This complex is used to train and test infantry platoons, either mounted or dismounted, on the skills necessary to conduct tactical movement techniques, detect, identify, engage and defeat stationary and moving infantry and armor targets in a tactical array
10	Will less than 10,000 feet of electrical power line be required for this alternative?		X		No power is required
11	Will less than 10,000 feet of fiber optic cable be required for this alternative?				Not Applicable No fiber optic cable is required
12	There is no requirement for water lines, a well, or leech field to be constructed for this alternative.		X		
13	Has a UXO survey been conducted on this site?	X			
14	Does this alternative minimize construction costs for the range?	X			
15	Has a line of sight analysis (GIS Preliminary) of this site been conducted?	X			Dense trees will prevent line of sight
16	Does this alternative impact any federally		X		

	listed T & E species or T & E species habitat?				
17	Does this alternative impact any candidate species, species specially managed by the installation, or state listed species which the installation manages for?		X		
18	Does this alternative impact any cultural sites (including historic structures, buildings, archeological sites or properties of traditional, religious or cultural significance)?				Unknown
19	Does this alternative impact on any Native American treaty rights or agreements?		X		
20	Does this alternative impact any jurisdictional water of the US to include jurisdictional wetlands?	X			Turkey Creek watershed
21	Does this alternative have an impact on surface water quality?		X		
22	Will this alternative have noise impacts on the civilian sector outside the installation boundary?		X		
23	Will this alternative potentially have noise impacts on military housing or other sensitive on post facilities (hospital, childcare facility, on post school)?		X		
24	Do noxious weeds/invasive species impact this alternative?		X		

25	Is the installation in a non-attainment or maintenance area for clean air?	X			
26	Provide other environmental impact factors:				Stormwater runoff, Migratory Bird Treaty Act

COMMENTS/ CONSIDERATIONS:

This alternative is the preferred alternative. This alternative provides ideal terrain that was requested by unit commanders, is neither heavily treed or without cover, and will have no impact on natural/cultural resources, waterways and other training facility utilization. It has been used previously as a temporary IPBC.

APPENDIX D –Actions/Projects Considered for Cumulative Impacts Assessment for Fort Carson, CO, 2015

No longer foreseeable or valid projects

- Additional IBCT that would train at Fort Carson and PCMS (part of the GTA EIS Proposed Action)
- 1st Space Brigade Operations Complex

Recently Completed or In Progress Projects at Fort Carson

Completed

- Battle Command Training Center
- Warriors in Transition Unit Complex (Barracks/Admin)
- Special Forces Tactical Unmanned Aerial Vehicle hangar, battalion operations facility complex, building renovations, and climbing/rappelling tower
- Combat Aviation Brigade (CAB) air control tower, ASB hangar, and barracks
- Range 111 Digital Multi-Purpose Training Range
- Unheated Storage building
- Verizon Wireless tower construction

In Progress

- CAB associated construction including infrastructure – Ongoing through FY18
- Central Energy Plant
- AMCOM Aircraft Maintenance Hangar
- Athletic Field, Tank Trail and Site Improvements
- National Institute Center of Excellence
- Special Forces Language Training Lab
- Air Support Operations Squadron Facility Expansion
- Iron Horse Park Area Development
- Family Housing deconstruction and rebuild in Cherokee Village
- Unmanned Aerial System Hangar
- Cheyenne Mountain Trap/Skeet range addition

In Progress or Recently Completed – Off Post

- Sam's Club / Walmart Academy Boulevard South construction
- Southern Delivery System

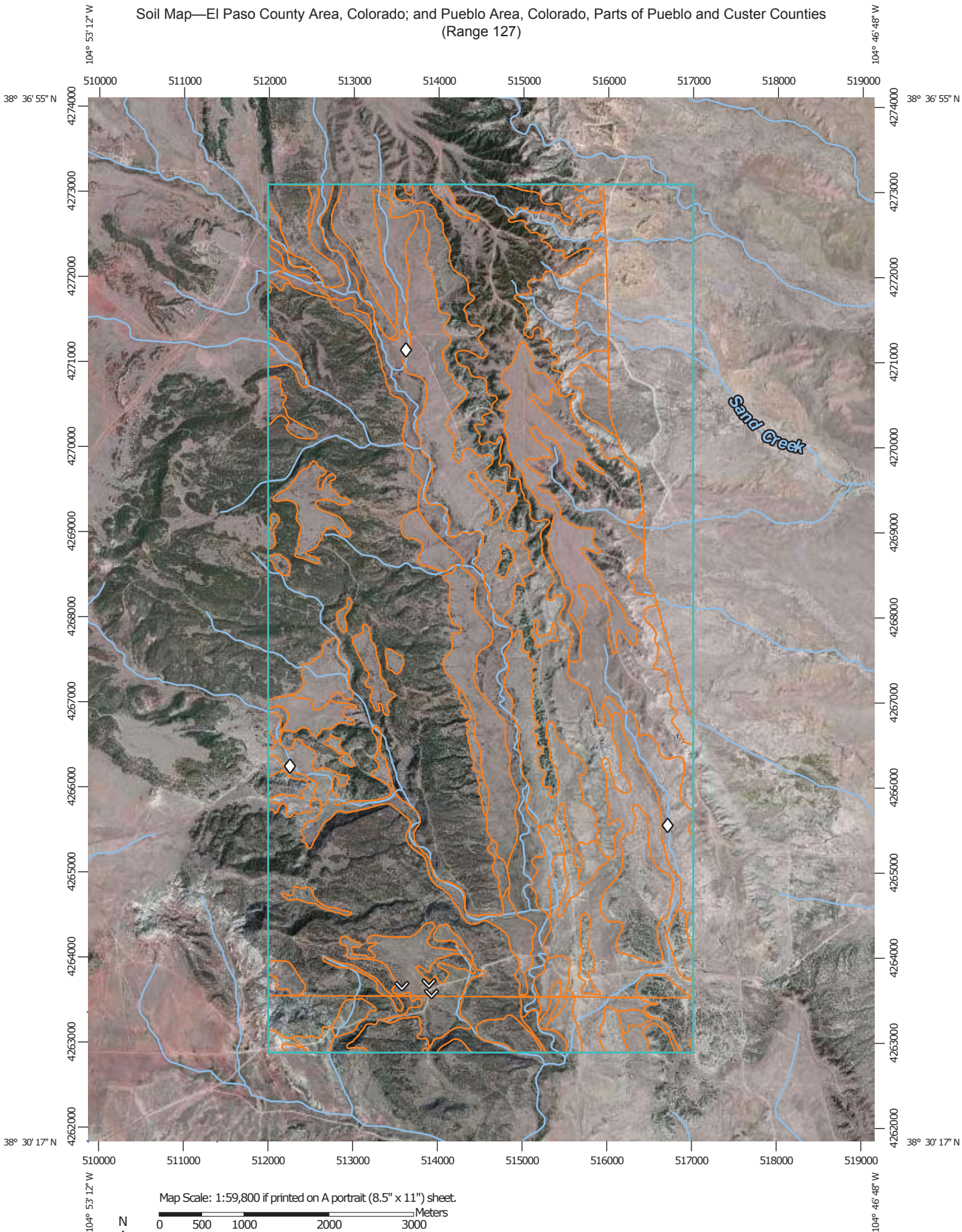
Foreseeable Future

- Special Forces Mountaineering Facility, Headquarters, and THOR3 facility
- Ammo Supply Point Expansion
- Physical Fitness Facility
- Army National Guard Readiness Center
- 1st Space Brigade Operations Building Improvements
- Charter Oak Ranch road improvement
- Gate 20 Access Control Facility

APPENDIX E – Fort Carson Range 127 and Range 153 Soils Data

USDA NRCS Web Soil Survey, 2014

Soil Map—El Paso County Area, Colorado; and Pueblo Area, Colorado, Parts of Pueblo and Custer Counties
(Range 127)



Map Scale: 1:59,800 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 10, Dec 23, 2013

Soil Survey Area: Pueblo Area, Colorado, Parts of Pueblo and Custer Counties
Survey Area Data: Version 12, Dec 30, 2013

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2011—Sep 22, 2011

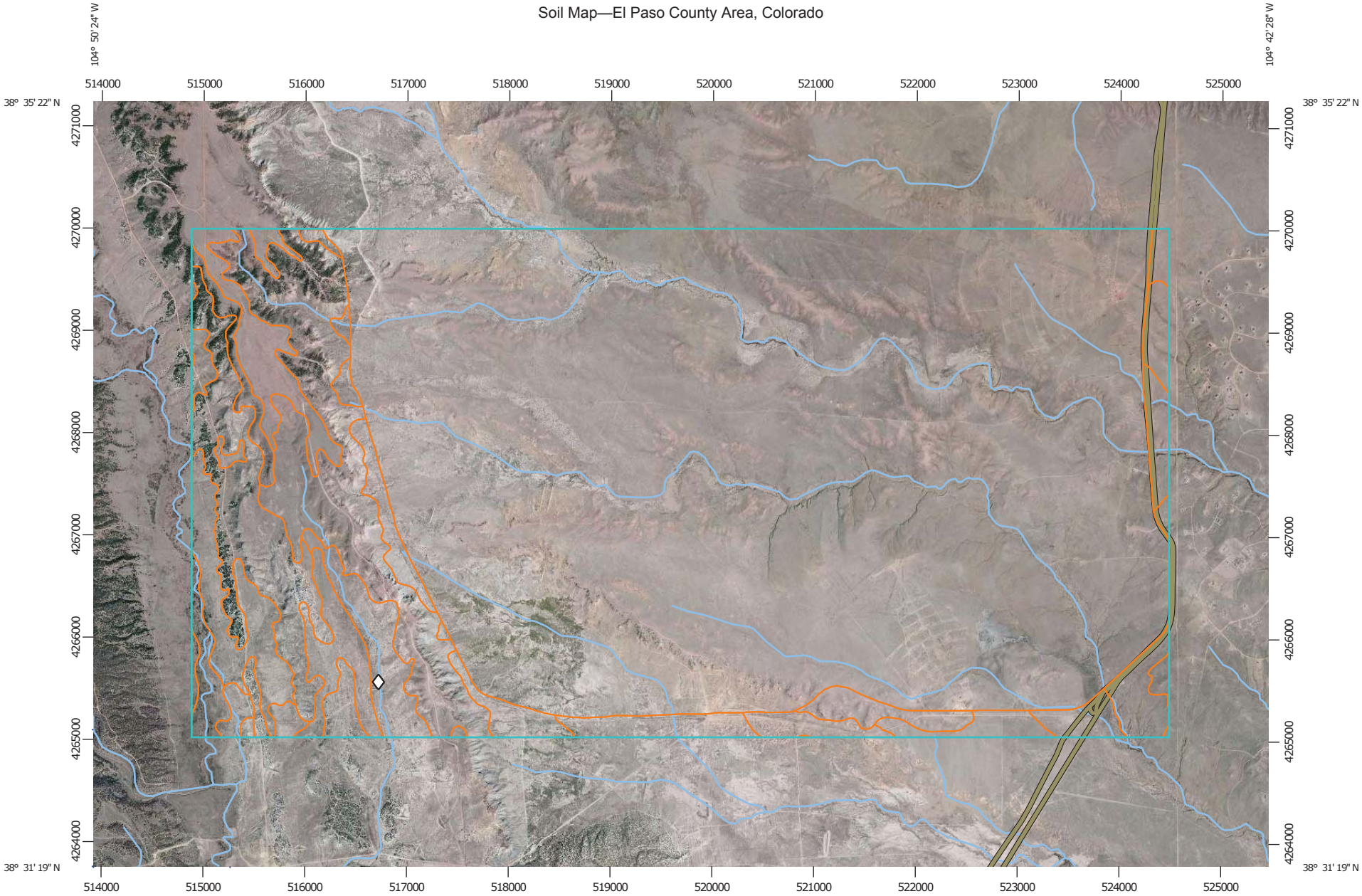
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
13	Bresser sandy loam, 5 to 9 percent slopes	20.1	0.2%
16	Chaseville gravelly sandy loam, 1 to 8 percent slopes	64.1	0.5%
43	Kim loam, 1 to 8 percent slopes	384.6	3.0%
47	Limon clay, 0 to 3 percent slopes	92.1	0.7%
50	Manvel silt loam, 2 to 6 percent slopes	1,237.8	9.7%
53	Manzanola clay loam, 3 to 9 percent slopes	191.8	1.5%
55	Nederland cobbly sandy loam, 9 to 25 percent slopes	670.2	5.3%
57	Neville fine sandy loam, 3 to 9 percent slopes	10.3	0.1%
58	Neville-Rednun complex, 3 to 9 percent slopes	84.4	0.7%
64	Penrose-Manvel complex, 3 to 45 percent slopes	1,142.1	9.0%
76	Rizozo-Neville complex, 3 to 30 percent slopes	10.7	0.1%
79	Satanta loam, 0 to 3 percent slopes	339.7	2.7%
80	Satanta loam, 3 to 5 percent slopes	362.9	2.9%
81	Satanta-Neville complex, 3 to 8 percent slopes	50.8	0.4%
82	Schamber-Razor complex, 8 to 50 percent slopes	863.8	6.8%
88	Stroupe-Travessilla-Rock outcrop complex, 9 to 90 percent slopes	3,591.2	28.3%
101	Ustic Torrifluvents, loamy	538.0	4.2%
107	Wilid silt loam, 0 to 3 percent slopes	210.5	1.7%
108	Wiley silt loam, 3 to 9 percent slopes	156.5	1.2%
113	Military impact area, unsurveyed	1,121.6	8.8%
115	Lithic Haplustepts-Rock outcrop complex	367.0	2.9%
118	Fort loam, 1 to 5 percent slopes, cool	331.3	2.6%

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
119	Fort sandy loam, 1 to 8 percent slopes, cool	35.7	0.3%
MzA	Manzanola silty clay loam, saline, 0 to 2 percent slopes	1.7	0.0%
Subtotals for Soil Survey Area		**11,878.9**	**93.5%**
Totals for Area of Interest		**12,698.8**	**100.0%**

Pueblo Area, Colorado, Parts of Pueblo and Custer Counties (CO626)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Gh	Glenberg-Haverson complex	10.3	0.1%
MvC	Manvel silt loam, 2 to 6 percent slopes	116.2	0.9%
MzA	Manzanola silty clay loam, saline, 0 to 2 percent slopes	33.4	0.3%
NeD	Neville sandy loam, 3 to 9 percent slopes	5.5	0.0%
PmE	Penrose-Minnequa complex, 1 to 15 percent slopes	87.3	0.7%
PrF	Penrose-Rock outcrop complex, 25 to 65 percent slopes	21.4	0.2%
Re2	Razor clay, eroded	15.8	0.1%
SaE	Schamber gravelly sandy loam, 5 to 25 percent slopes	8.2	0.1%
SgD	Shingle silty clay loam, 1 to 9 percent slopes	14.1	0.1%
TM	Table Mountain association	28.2	0.2%
TrG	Travessilla-Rock outcrop complex, 30 to 90 percent slopes	232.9	1.8%
TsD	Travessilla sandy loam, 1 to 9 percent slopes	131.1	1.0%
WeB	Wilid silt loam, 0 to 3 percent slopes	78.7	0.6%
Wk	Wiley-Kim loams	36.7	0.3%
Subtotals for Soil Survey Area		**819.9**	**6.5%**
Totals for Area of Interest		**12,698.8**	**100.0%**



Map Scale: 1:52,800 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 500 1000 2000 3000

Feet
0 2500 5000 10000 15000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

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- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 12, Sep 29, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 15, 2011—Sep 22, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

El Paso County Area, Colorado (CO625)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
33	Heldt clay loam, 0 to 3 percent slopes	159.2	1.3%
43	Kim loam, 1 to 8 percent slopes	307.3	2.6%
47	Limon clay, 0 to 3 percent slopes	107.4	0.9%
50	Manvel loam, 3 to 9 percent slopes	420.6	3.5%
53	Manzanola clay loam, 3 to 9 percent slopes	28.1	0.2%
54	Midway clay loam, 3 to 25 percent slopes	25.3	0.2%
55	Nederland cobbly sandy loam, 9 to 25 percent slopes	70.1	0.6%
64	Penrose-Manvel complex, 3 to 45 percent slopes	533.4	4.5%
75	Razor-Midway complex	159.9	1.3%
79	Satanta loam, 0 to 3 percent slopes	204.2	1.7%
82	Schamber-Razor complex, 8 to 50 percent slopes	949.2	8.0%
101	Ustic Torrifluvents, loamy	77.1	0.7%
107	Wilid silt loam, 0 to 3 percent slopes	87.5	0.7%
113	Military impact area, unsurveyed	8,675.5	73.2%
115	Lithic Haplustepts-Rock outcrop complex	11.2	0.1%
118	Fort loam, 1 to 5 percent slopes, cool	10.2	0.1%
119	Fort sandy loam, 1 to 8 percent slopes, cool	22.2	0.2%
Totals for Area of Interest		**11,848.3**	**100.0%**

APPENDIX F – Fort Carson Cultural Resources Program

Section 106 Correspondence

HISTORY Colorado

RECEIVED MAY 05 2015

April 30, 2015

Carlos Rivero-deAguilar
Chief, Environmental Division
Department of the Army
US Army Installation Management Command
Directorate of Public Works
1626 Evans Street, Building 1219
Fort Carson, Colorado 80913-4143

Re: Construct and Operate an Infantry Platoon Battle Course (IPBC) Complex, Range 127, Fort Carson (REC2015-248) (HC #68021)

Dear Mr. Rivero-deAguilar:

Thank you for your correspondence dated April 16, 2015 (received by our office on April 22, 2015) regarding the subject undertaking.

In consideration of the information that we currently have on file for the area of potential effects as well as the process set forth by the Programmatic Agreement Regarding Military Training and Operational Support Activities Down Range Fort Carson, we concur with your determination of no adverse effect pursuant to 36 CFR 800.5(b). Should the proposed construction or scope of activities increase from that which is described by your recent documentation, we anticipate that additional consultation under Section 106 of the National Historic Preservation Act will occur. An additional comment is necessary: during our review of the project information we noted that site 5EP6002 is listed within both the protected property list (Appendix 2) as well as the list for those sites proposed for adverse effects (Appendix 3) within the above agreement. While we recognize that the latter listing is correct and the property was released from future protection measures, we wanted to alert you of this issue so that the table may be corrected.

The consultation process does involve other consulting parties such as local governments and Tribes, which as stipulated in 36 CFR 800.3 are required to be notified of the undertaking. Additional information provided by the local government, Tribes or other consulting parties may cause our office to re-evaluate our comments and recommendations. Please note that our compliance letter does not end the 30-day review period provided to other consulting parties.

Should unidentified archaeological resources including human remains be discovered in the course of the project, the Fort Carson Agreement discovery protocols should be followed.

Thank you for the opportunity to comment. If we may be of further assistance please contact Mark Tobias, Section 106 Compliance Manager, at (303) 866-4674 or mark.tobias@state.co.us.

Sincerely,

for Edward C. Nichols
State Historic Preservation Officer
ECN/MAT

HISTORY Colorado

RECEIVED OCT 19 2015

October 9, 2015

James Lessard
Chief, Environmental Division
Department of the Army
US Army Installation Management Command
Directorate of Public Works
1626 Evans Street, Building 1219
Fort Carson, Colorado 80913-4143

Re: Expand Range 153, Fort Carson (REC2015-248) (HC #68295) -- Revised Letter

Dear Mr. Lessard:

We received initial notification and project documentation from your office for the proposed Range 153 expansion (the undertaking) on May 29, 2015 with follow-up correspondence received on August 11, 2015. Clarification regarding Army's determinations of National Register eligibility and project effect was requested within our letters dated June 5, 2015 and September 4, 2015.

In an effort to conclude consultation under Section 106 of the National Historic Preservation Act (36 CFR Part 800) for the proposed undertaking, Jennifer Kolise, Acting Cultural Resources Manager, and Mark Tobias, Section 106 Compliance Manager, reviewed both issues during a telephone conversation on October 9, 2015. Project details were discussed as were considerations for possible next steps as outlined under Section 106 of the National Historic Preservation Act as well as Fort Carson's Programmatic Agreement (PA) for downrange training. In consideration of exempted undertakings as outlined by Appendix A of the downrange training PA, we concur that a finding of no historic properties affected is appropriate for the proposed expansion of Range 153. With regard to the National Register eligibility of site 5EP76/5EP77, a site that is located outside of the proposed and expanded Range 153 footprint, we anticipate that additional consultation will occur to address information gaps that are mutually recognized within the administrative record for this resource.

The Section 106 consultation process does involve other consulting parties such as local governments and Tribes, which as stipulated in 36 CFR 800.3 are required to be notified of the undertaking. Additional information provided by the local government, Tribes or other consulting parties may cause our office to re-evaluate our comments and recommendations.

Should unidentified archaeological resources be discovered in the course of the project, work must be interrupted until the resources have been evaluated in terms of the National Register eligibility criteria (36 CFR 60.4) in consultation with our office.

Thank you for the opportunity to comment. If we may be of further assistance please contact Mark Tobias, Section 106 Compliance Manager, at (303) 866-4674 or mark.tobias@state.co.us.

Sincerely,

Steve Turner, AIA
State Historic Preservation Officer
ST/mt

APPENDIX G – Fort Carson Operational Noise Assessment, June 2015*

*This operational noise assessment includes demolition and larger caliber weapons (20mm and greater) at Range 153, however based on the results of this assessment, the alternative was eliminated from further consideration.

DEPARTMENT OF THE ARMY
US ARMY INSTITUTE OF PUBLIC HEALTH
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND, MD 21010-5403

MCHB-IP-EON

21 JUL 2015

MEMORANDUM FOR Environmental Division, Directorate of Public Works (IMCR-PWE/Ms. Emma Buccambuso), 1626 Evans St., Building 1219, Fort Carson, CO 80913-4179

SUBJECT: Operational Noise Consultation, WS.0034855-15, Operational Noise Assessment for Proposed Infantry Squad Battle Course and Infantry Platoon Battle Course, Fort Carson, Colorado, 08 June 2015

1. We are enclosing a copy of the consultation.

2. Please contact us if we can be of further service.

3. The point of contact is Ms. Kristy Broska, Environmental Protection Specialist or Ms. Catherine Stewart, Program Manager, Operational Noise, Army Institute of Public Health, at DSN 584-3829, Commercial (410) 436-3829, or email: kristy.a.broska.civ@mail.mil or catherine.m.stewart20.civ@mail.mil.

FOR THE DIRECTOR:

Gayle E. Mccowin

GAYLE E. MCCOWIN
LTC, MS
Portfolio Director, Environmental Health Engineering

Encl

CF:
AEC (IMAE-TSP)
PHCR-West (MCHB-RW-EH)

USAPHC
U.S. ARMY PUBLIC HEALTH COMMAND
5158 Blackhawk Road, Aberdeen Proving Ground, Maryland 21010-5403

OPERATIONAL NOISE CONSULTATION NO. WS.0034855-15 OPERATIONAL NOISE ASSESSMENT FOR PROPOSED INFANTRY SQUAD BATTLE COURSE AND INFANTRY PLATOON BATTLE COURSE FORT CARSON, COLORADO 08 JUNE 2015

Preventive Medicine Survey: 40-5f1

DEPARTMENT OF THE ARMY
US ARMY INSTITUTE OF PUBLIC HEALTH
5158 BLACKHAWK ROAD
ABERDEEN PROVING GROUND, MD 21010-5403

MCHB-IP-EON

EXECUTIVE SUMMARY
OPERATIONAL NOISE CONSULTATION
NO. WS.0034855-15
OPERATIONAL NOISE ASSESSMENT FOR
PROPOSED INFANTRY SQUAD BATTLE COURSE
AND INFANTRY PLATOON BATTLE COURSE
FORT CARSON, COLORADO
08 JUNE 2015

1. PURPOSE. The U.S. Army Public Health Command Operational Noise Program assessed the noise impacts for the proposed Range 153 Infantry Squad Battle Course (ISBC) and Range 127 Infantry Platoon Battle Course (IPBC) at Fort Carson. The consultation presents the results.

2. FINDINGS.

a. Demolition and Large Caliber Weapons.

(1) Baseline Conditions. Near the City of Fountain, the Noise Zones extend beyond the boundary less than 0.68 miles encompassing commercial and undeveloped lands. Along the eastern boundary, the Land Use Planning Zone (LUPZ) extends up to 2.8 miles and the Zone II approximately 0.8 miles encompassing portions of the El Rancho and Midway Developments. Zone III extends less than to 0.12 miles into the El Rancho Development. To the south, the LUPZ extends less than 0.34 miles into undeveloped land. Along the western boundary, the LUPZ extends up to 0.44 mile and the Zone II approximately 0.23 mile encompassing Turkey Canyon Ranch. South of Red Rock Valley Estates, the LUPZ extends less than 0.06 miles into an undeveloped area.

(2) Projected Conditions. The addition of the ISBC and IPBC increases the size of the Noise Zones. Near the City of Fountain, the Noise Zones extend beyond the boundary less than 0.71 miles encompassing commercial and undeveloped lands. Along the eastern boundary, the LUPZ extends up to 3.23 miles and the Zone II approximately 1.24 miles encompassing portions of the El Rancho and Midway Developments. Zone III extends less than to 0.37 miles into the El Rancho Development. To the south, the LUPZ extends less than 0.4 miles into undeveloped land. Along the western boundary, the LUPZ extends up to 0.47 mile and the Zone II

approximately 0.23 mile encompassing Turkey Canyon Ranch. South of Red Rock Valley Estates, the LUPZ extends less than 0.1 miles into an undeveloped area. Under the projected conditions, Zone III increases from 31 (5 homes) to 253 acres (21 homes) and Zone II from 2,086 (81 homes) to 2,979 acres (89 homes) in the El Rancho Development. The El Rancho Development consists of large 5-acre lots, not all of which are developed.

(3) Complaint risk guidelines indicate a moderate to high probability of receiving noise complaints for existing and projected conditions.

b. Small Caliber Weapons.

(1) For baseline conditions, Zone II extends less than a mile into the El Rancho Development. Zone III extends approximately 0.16 miles encompassing undeveloped land.

(2) Under the projected conditions, Zone II increases slightly near Range 153. The off-post Zone III remains unchanged. The increased small caliber firing at Range 153 might be noticeable to El Rancho residents.

(3) Due to the remote nature of Range 127, it is not necessary to assess the small caliber weapons. Small caliber weapon noise remains within a few kilometers of the range.

3. RECOMMENDATIONS.

a. Fort Carson should continue to inform the local community of noise-producing activities.

b. Incorporate this consultation into the appropriate National Environmental Policy Act documents.

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List of Tables

OPERATIONAL NOISE CONSULTATION
NO. WS.0034855-15
OPERATIONAL NOISE ASSESSMENT FOR
PROPOSED INFANTRY SQUAD BATTLE COURSE AND
INFANTRY PLATOON BATTLE COURSE
FORT CARSON, COLORADO
08 JUNE 2015

1. REFERENCES. Appendix A lists the references used in this consultation. Appendix B contains a glossary of terms, acronyms and abbreviations.

2. AUTHORITY. The Army Environmental Command, San Antonio, TX funded this consultation under WBS.0034855.

3. PURPOSE. The U.S. Army Public Health Command Operational Noise Program assessed the noise impacts for the proposed Range 153 Infantry Squad Battle Course (ISBC) and Range 127 Infantry Platoon Battle Course (IPBC) at Fort Carson. The consultation presents the results.

4. LAND USE GUIDELINES.

a. Army Regulation (AR) 200-1 translates noise exposure on communities into Noise Zones (see Table 1) (U.S. Army 2007). Regulation guidelines state that for land use planning purposes, noise-sensitive land uses range from acceptable to not compatible within the Noise Zones. Examples of noise-sensitive land uses are housing, schools, and medical facilities. Within Noise Zones II and III, existing “noise-sensitive” land uses are pre-existing, non-conforming land uses. Military and civilian communities implementing the recommendations would facilitate future development that is minimally affected by military noise.

TABLE 1. NOISE LIMITS (AR 200-1)

Noise Zone	Demolition and Large Caliber Activity dB CDNL	Small Caliber Activity dB Peak
LUPZ	57 – 62	n/a
I	< 62	< 87
II	62 – 70	87 – 104
III	> 70	> 104

Notes:
CDNL = C-weighted average Day Night Level, dB = decibel,
LUPZ = Land Use Planning Zone, n/a = not applicable

b. Per AR 200-1 guidelines:

- Zone III - Noise-sensitive land uses are not recommended (incompatible).
- Zone II - Although local conditions such as availability of developable land or cost may require noise-sensitive land, uses in Zone II, this type of land use is generally not compatible and is strongly discouraged on the installation and in surrounding communities. Planners should consider all viable alternatives to limit development in Zone II to non-sensitive activities such as industry, manufacturing, transportation and agriculture.
- Zone I - Noise-sensitive land uses are generally acceptable within the Zone I. However, although an area may only receive Zone I levels, military operations may be loud enough to be audible. Zone I is not one of the contours shown on the map; rather it is the entire area outside of the Zone II contour.
- The Land Use Planning Zone (LUPZ) is a subdivision of Zone I. The LUPZ is 5 dB lower than Zone II. Within this area, noise-sensitive land uses are generally acceptable. However, communities and individuals often have different views regarding what level of noise is acceptable or desirable. To address this, some local governments have implemented land use planning measures out beyond the Zone II limits. Additionally, implementing planning controls within the LUPZ can develop a buffer to avert future noise conflicts.

c. Average noise levels are the standard for long-term land use planning, but do not adequately assess community noise complaint risk. Supplemental metrics identify where individual events may reach levels high enough to generate complaints. Peak noise levels correlate to complaint risk for demolition and large caliber activity as follows:

- Low Risk of Complaints: < 115 dB Peak
- Moderate Risk of Complaints: 115-130 dB Peak
- High Risk of Complaints: > 130 dB Peak

5. NOISE CONTOURING PROCEDURES.

a. Demolition and Large Caliber Weapons.

(1) The BNOISE2 modeling program calculates large arms (20mm and greater) and high-explosives (U.S. Army 2009) noise levels. The sounds from large arms, demolitions, and other impulsive sounds generally create the largest complaint issues because the sound can travel far, is difficult to mitigate and can be accompanied by vibration that may increase public annoyance. The CDNL contours are based on a 250-day assessment period and account for the terrain at Fort Carson.

(2) The demolition and large caliber (20mm and greater) noise contours were developed based on the ammunition utilization tables located in Appendix C. Over the course of a year, not all of the firing points and ranges are used. Range utilization varies from year to year depending upon training mission requirements. Therefore, technicians created an amalgamation of the activity using Fiscal Years (FY) 2012 – 2014.

b. Small Caliber Weapons.

(1) The Small Arms Range Noise Assessment Model (SARNAM) (U.S. Army 2003) calculates noise from small arms (.50 caliber and below) activity. SARNAM incorporates the latest available information on weapons noise source models, directivity and sound propagation. The calculation algorithm assumes weather conditions or wind directions that favor sound propagation. Small caliber weapon noise is addressed using peak levels and therefore has no assessment period.

(2) Based on annual expenditure (Appendix D), daily training and troop qualification activities on the ranges can be a common occurrence.

6. PROPOSED RANGE DESCRIPTIONS.

a. Range 127 IPBC.

(1) Range 127 is located in the central area of Fort Carson, approximately 3,200 meters from the western boundary. Current activity includes firing small caliber rounds up to and including .50 caliber. As an IPBC, the small caliber annual ammunition expenditure would increase. Additional activity would include large guns and demolition activity (Table 2).

TABLE 2. RANGE 127 EXPENDITURE

Ammunition	Quantity Fired FY 2012	Quantity Fired FY 2013	Quantity Fired FY 2014	Proposed Expenditure
300 Win-Mag	0	6	92	200
5.56mm	134,496	3,646	11,288	172,000
5.56mm Blank	70,062	19,035	13,042	225,000
7.62mm	38,911	1,177	7,029	35,700
7.62mm Blank	15,077	6,770	3,500	30,000
.50 caliber	0	0	103,382	140,000
.50 caliber Blank	0	0	1,200	35,000
25mm Gun, Inert	0	0	0	16,000
120mm Tank, Inert	0	0	0	700
60mm Mortar, Inert	136			
Missile TOW, Inert	0	0	0	12
Demolition, Bangalore,	0	0	0	30
Demolition, C-4, 1.25 lb	0	0	0	150
40mm Grenade, Inert	0	501	18,194	7,000
Simulators (assorted types)	0	0	0	75

Inert is defined as any round that does not make noise upon impact (i.e. smoke, TP-T, etc…)

(2) The proposed change reorients the range and expands the operating area to around 3,900 acres (Figure 1).

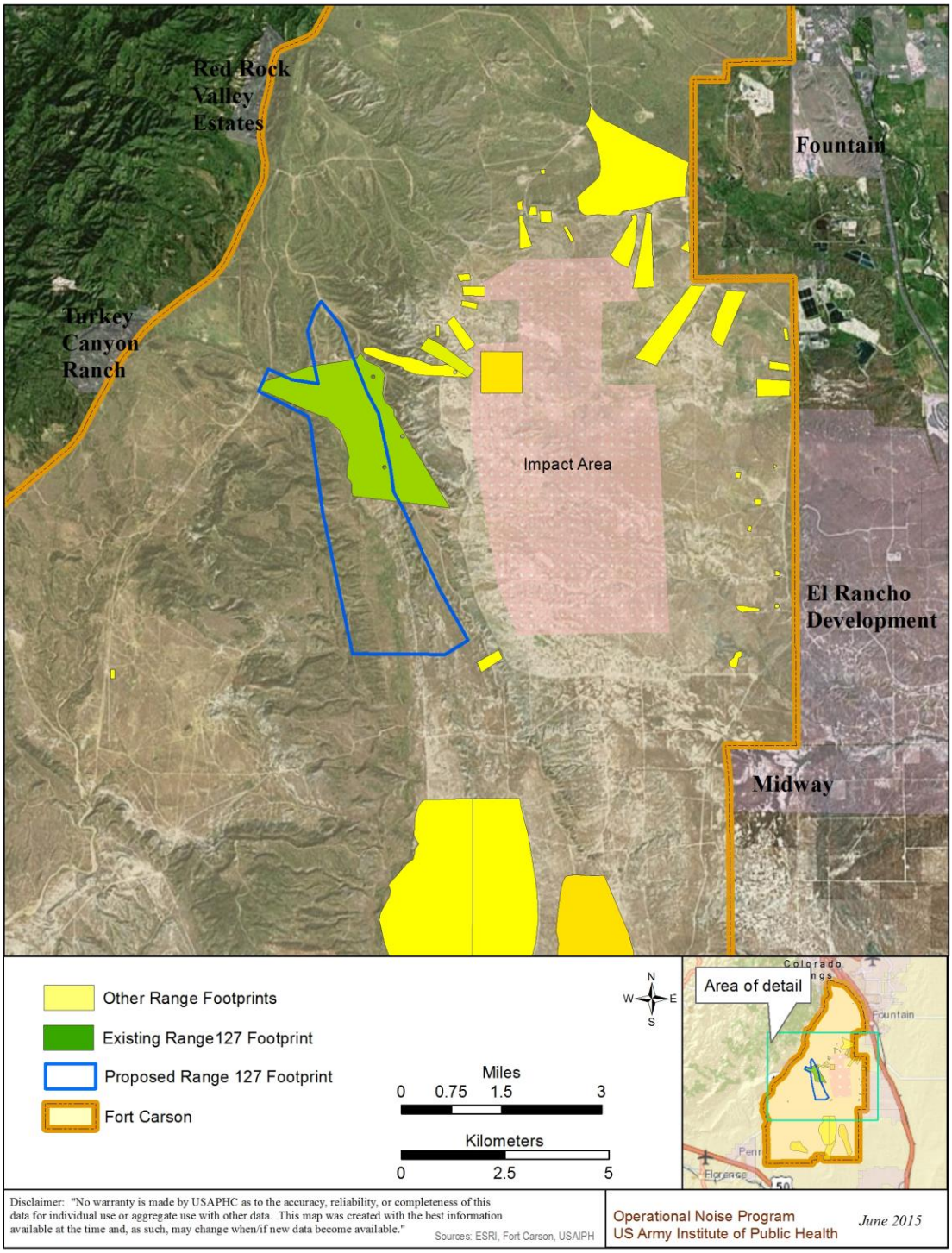

FIGURE 1. RANGE 127 IPBC LOCATION

b. Range 153 ISBC.

(1) Range 153 is approximately 380 meters from the eastern boundary. The current activity includes firing small caliber rounds up to and including .50 caliber, 25mm gun (Bradley), and the 120mm Tank. Under the expanded range layout, the annual ammunition expenditure would increase. New activity at Range 153 includes demolition charges (Table 3).

TABLE 3. RANGE 153 EXPENDITURE

Ammunition	Quantity Fired FY 2012	Quantity Fired FY 2013	Quantity Fired FY 2014	Proposed Expenditure
.300 Win Mag	434	0	0	0
5.56mm	4,515	21,128	19,898	175,000
5.56mm Blank	0	3,120	18,204	165,000
7.62mm	1,671	0	27,390	30,650
7.62mm Blank	0	0	16,534	27,000
.50 caliber	0	0	5,100	130,000
9mm, AT-4 Trainer	0	4,601	715	0
25mm Gun, Inert	0	0	2,970	16,000
120mm Tank, Inert	0	0	576	500
Demolition, Bangalore,	0	0	0	30
Demolition, C-4, 1.25 lb	0	0	0	100
40mm Grenade, Inert	0	286	101	5,400
Simulators (assorted types)	0	0	0	75

Inert is defined as any round that does not make noise upon impact (i.e. smoke, TP-T, etc…)

(2) The proposed change expands the operating area of Range 153 from 31 acres to around 185 acres (Figure 2).

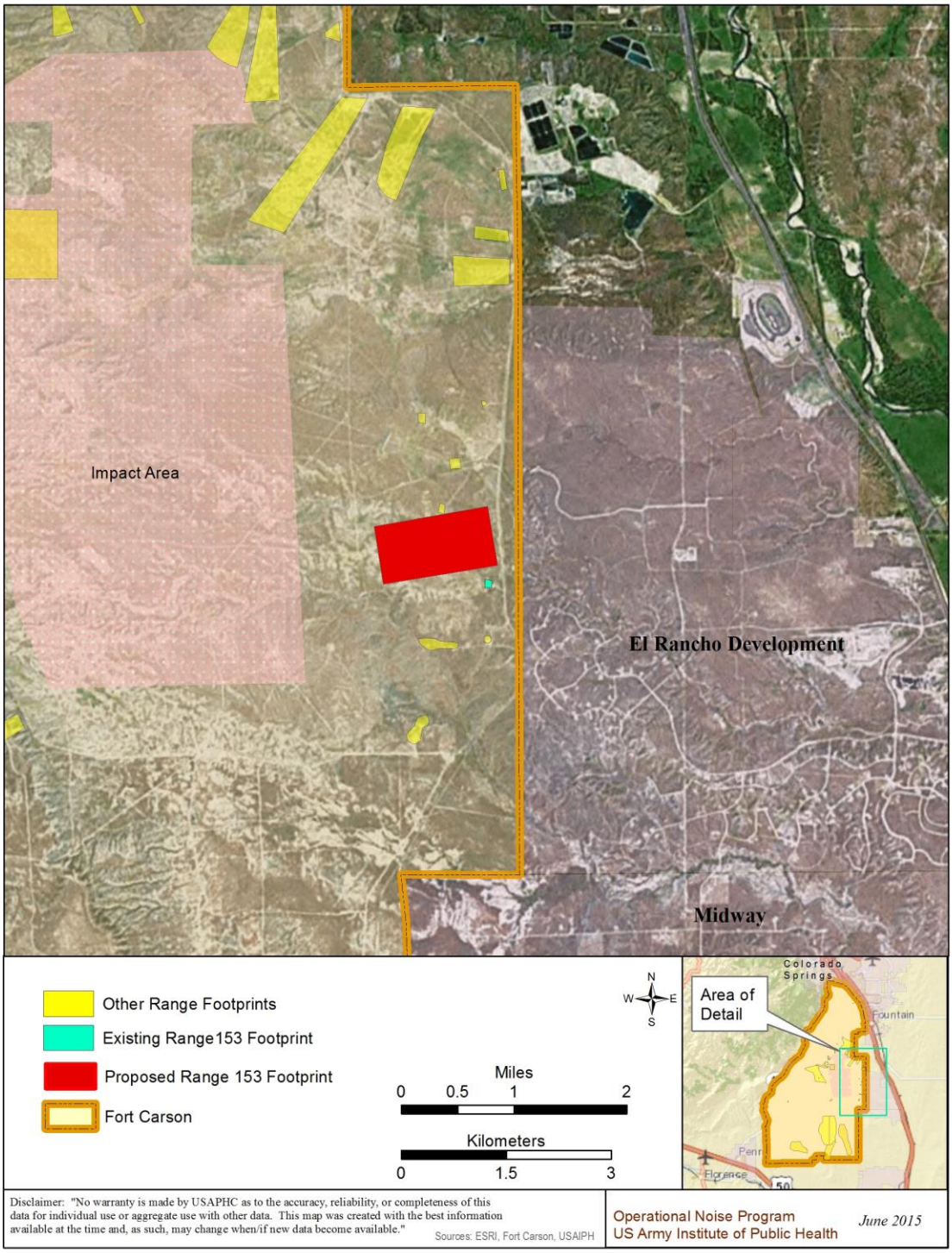

FIGURE 2. RANGE 153 ISBC LOCATION

7. NOISE ASSESSMENT.

a. Baseline Conditions.

(1) Figure 3 shows the baseline (existing) demolition and large caliber weapons Noise Zones. Near the City of Fountain, the Noise Zones extend beyond the boundary less than 0.68 miles encompassing commercial and undeveloped lands. Along the eastern boundary, the LUPZ extends up to 2.8 miles and the Zone II approximately 0.8 miles, encompassing portions of the El Rancho and Midway Developments. Zone III extends less than to 0.12 miles in to the El Rancho Development. To the south, the LUPZ extends less than 0.34 miles into undeveloped land. Along the western boundary, the LUPZ extends up to 0.44 mile and the Zone II approximately 0.23 mile, encompassing Turkey Canyon Ranch. South of Red Rock Valley Estates, the LUPZ extends less than 0.06 miles into an undeveloped area.

(2) Table 4 lists the total acreage for each Noise Zone, and the acreage of those portions extending off the installation. Table 5 lists the distance the off-post Noise Zones extend, the acreage within, and the general land use.

TABLE 4. BASELINE CONDITIONS NOISE ZONE ACREAGE

Noise Zone	Total Acreage	Off-Post Acreage
LUPZ	48,083	17,142
Zone II	36,511	4,107
Zone III	32,986	330

TABLE 5. BASELINE CONDITIONS – OFF-POST NOISE ZONE ACREAGE AND GENERAL LAND USE

Area	Noise Zone	Distance Beyond Boundary (meters)	Off-Post Acreage	Off-Post Land Uses/Functions
City of Fountain	LUPZ	< 1,000	411	Commercial, Undeveloped
	Zone II	≈ 600	1470	Commercial, Undeveloped
	Zone III	< 200	18	Undeveloped
Area between Fountain & El Rancho	LUPZ	*see El Rancho & Midway Developments		
	Zone II	< 2500	1651	Undeveloped
	Zone III	< 900	281	Undeveloped
El Rancho & Midway Developments	LUPZ	< 4,500	15,852	Primarily Residential
	Zone II	≈ 1,300	2,086	Residential
	Zone III	< 200	31	Residential
South of Midway Development	LUPZ	*see El Rancho & Midway Developments		
	Zone II	< 500	133	Undeveloped
	Zone III	0	0	n/a
South of Boundary	LUPZ	≈ 550	636	Undeveloped
	Zone II	0	0	n/a
	Zone III	0	0	n/a
Turkey Canyon Ranch	LUPZ	≈ 700	234	Residential
	Zone II	< 375	86	Residential
	Zone III	0	0	n/a
South of Red Rock Valley Estates	LUPZ	< 100	9	Undeveloped
	Zone II	0	0	n/a
	Zone III	0	0	n/a

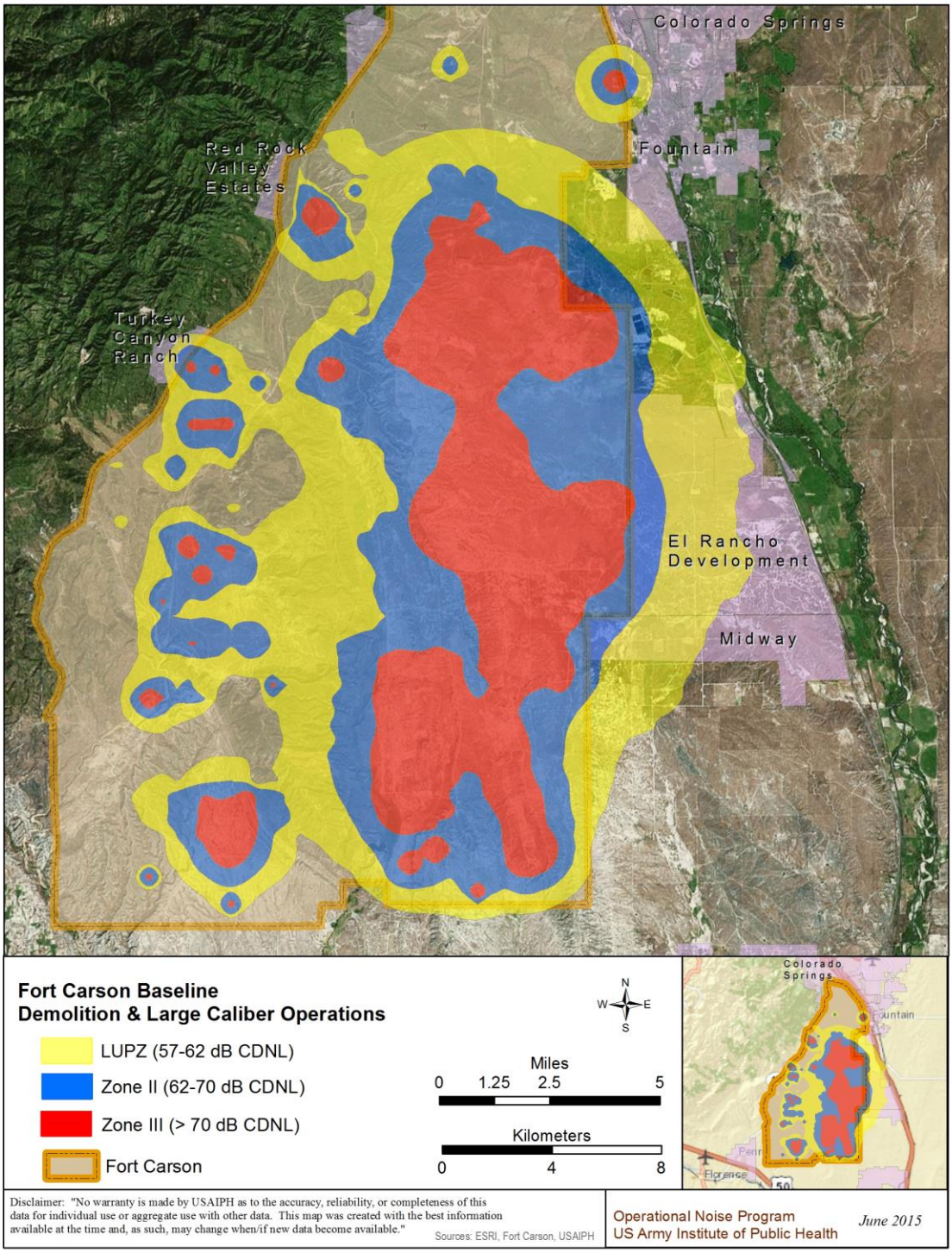

FIGURE 3. BASELINE CONDITION NOISE ZONES

b. Projected Conditions. The projected conditions include the proposed activity at Range 127 and Range 153.

(1) Figure 4 shows the projected demolition and large caliber weapons Noise Zones. Near the City of Fountain, the Noise Zones extend beyond the boundary less than 0.71 miles, encompassing commercial and undeveloped lands. Along the eastern boundary, the LUPZ extends up to 3.23 miles and the Zone II approximately 1.24 miles, encompassing portions of the El Rancho and Midway Developments. Zone III extends less than to 0.37 miles into the El Rancho Development. To the south, the LUPZ extends less than 0.4 miles into undeveloped land. Along the western boundary, the LUPZ extends up to 0.47 mile and the Zone II approximately 0.23 mile, encompassing Turkey Canyon Ranch. South of Red Rock Valley Estates, the LUPZ extends less than 0.1 miles into an undeveloped area.

(2) Table 6 lists the total acreage for each Noise Zone, and the acreage of those portions extending off the installation. Table 7 lists the distance the off-post Noise Zones extend, the acreage within, and the general land use.

TABLE 6. PROJECTED CONDITIONS NOISE ZONE ACREAGE

Noise Zone	Total Acreage	Off-Post Acreage
LUPZ	46,875	18,706
Zone II	39,064	5,133
Zone III	38,383	553

(3) Figure 5 shows the baseline and projected demolition and large caliber weapons Noise Zones overlaid on an aerial and a street view of the El Rancho Development. The El Rancho Development consists of large 5-acre lots, not all of which are developed. Under projected conditions, Zone III increases from 31 (5 homes) to 253 acres (21 homes) and Zone II from 2,086 (81 homes) to 2,979 acres (89 homes). Home count is from available imagery of structures that appear to be residential.

TABLE 7. PROJECTED CONDITIONS – OFF-POST NOISE ZONE ACREAGE AND GENERAL LAND USE

Area	Noise Zone	Distance Beyond Boundary (meters)	Off-Post Acreage	Off-Post Land Uses/Functions
City of Fountain	LUPZ	≈ 1150	433	Commercial, Undeveloped
	Zone II	< 600	142	Commercial, Undeveloped
	Zone III	< 200	18	Undeveloped
Area between Fountain & El Rancho	LUPZ	*see El Rancho & Midway Developments		
	Zone II	≈ 2,800	1,750	Undeveloped
	Zone III	< 900	282	Undeveloped
El Rancho & Midway Developments	LUPZ	< 5,200	17,156	Primarily Residential
	Zone II	< 2,000	2,979	Residential
	Zone III	< 600	253	Residential
South of Midway Development	LUPZ	*see El Rancho & Midway Developments		
	Zone II	< 600	159	Undeveloped
	Zone III	0	0	n/a
South of Boundary	LUPZ	< 650	829	Undeveloped
	Zone II	0	0	n/a
	Zone III	0	0	n/a
Turkey Canyon Ranch	LUPZ	< 750	270	Residential
	Zone II	< 375	91	Residential
	Zone III	0	0	n/a
South of Red Rock Valley Estates	LUPZ	≈ 160	18	Undeveloped
	Zone II	0	0	n/a
	Zone III	0	0	n/a

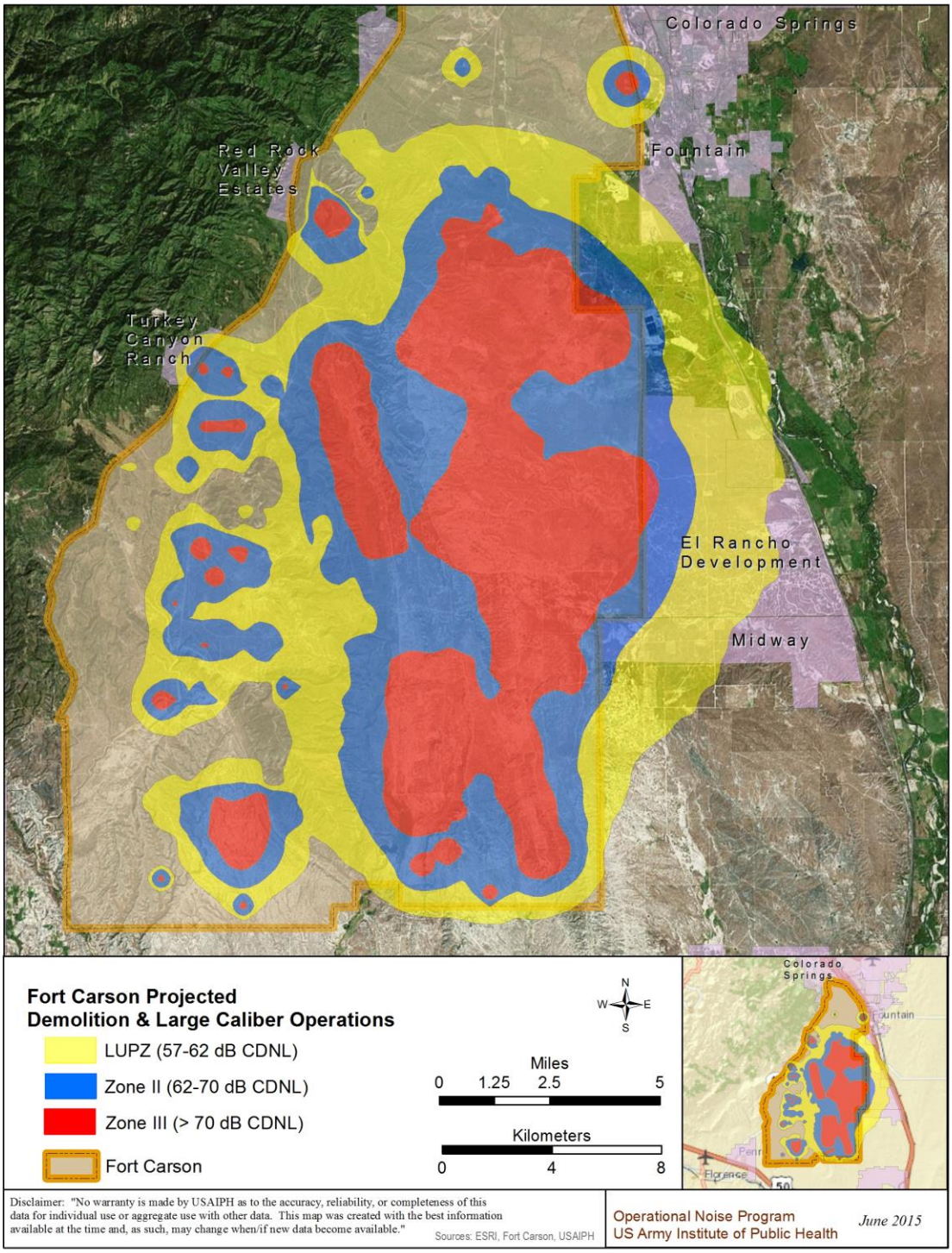

FIGURE 4. PROJECTED CONDITIONS NOISE ZONES

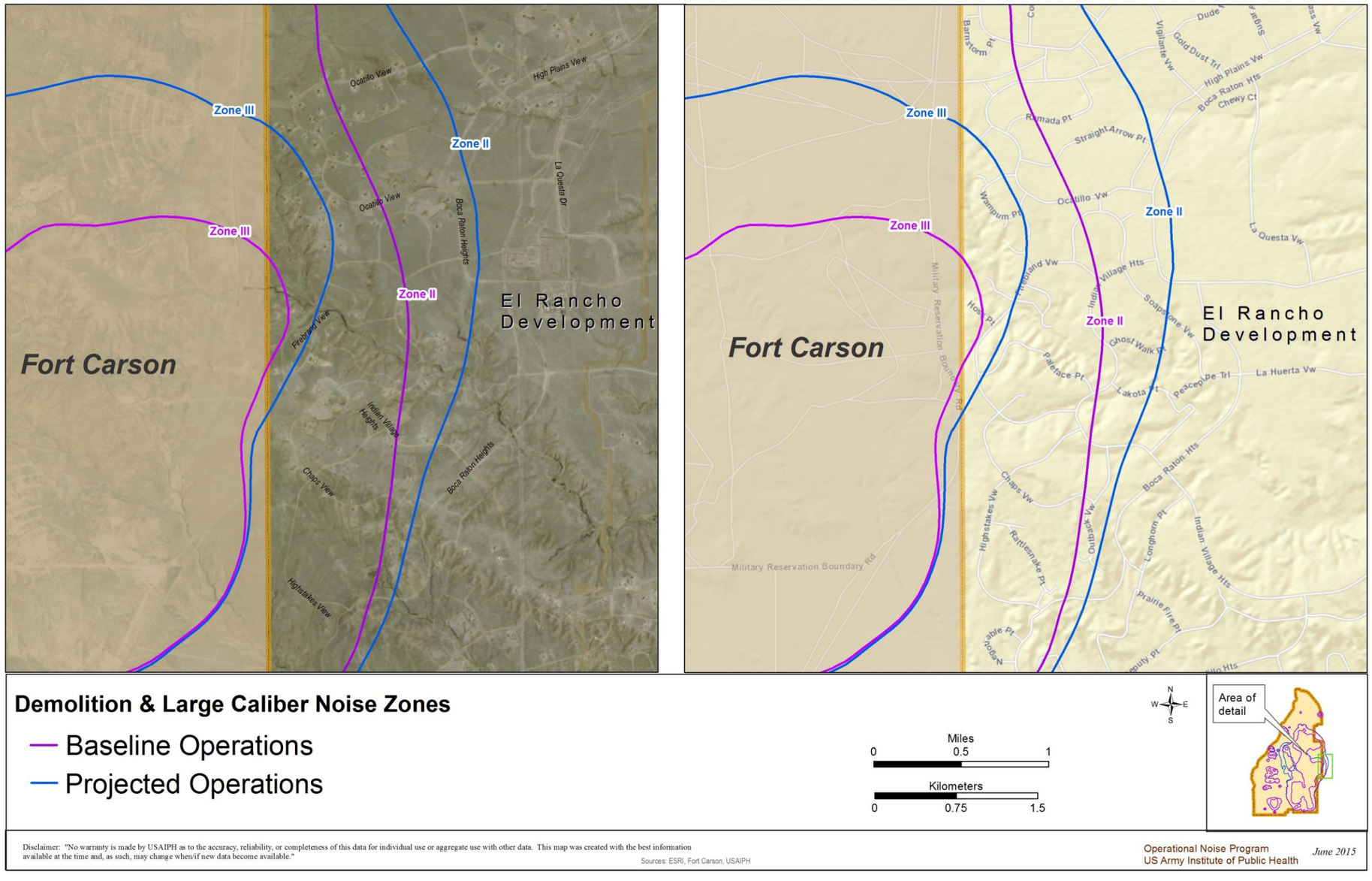

FIGURE 5. EL RANCHO AREA NOISE ZONES

c. Complaint Risk.

(1) Figure 6 depicts peak noise levels for the baseline large caliber and demolition activity. The complaint risk contours contain several residential land uses off the installation. According to complaint risk guidelines, there is a moderate to high risk of noise complaints due large caliber weapons operations. The actual noise complaints received each year, which are primarily due to large caliber activity, validates the potential for complaints. It is important to remember that the contours represent unfavorable weather conditions, meaning those conditions that enhance sound propagation toward the receiver. Thus, based on meteorological conditions, the potential for noise complaints can be variable.

(2) The additional activity to Ranges 127 and 153 have a minimal impact on the complaint risk. The moderate complaint risk area does not change. The majority of the changes occur within Fort Carson impact/range/training areas. There is a minor increase in the high complaint risk area in the El Rancho development. Figure 7 is an overlay of the changed peak noise levels from the baseline and projected conditions.

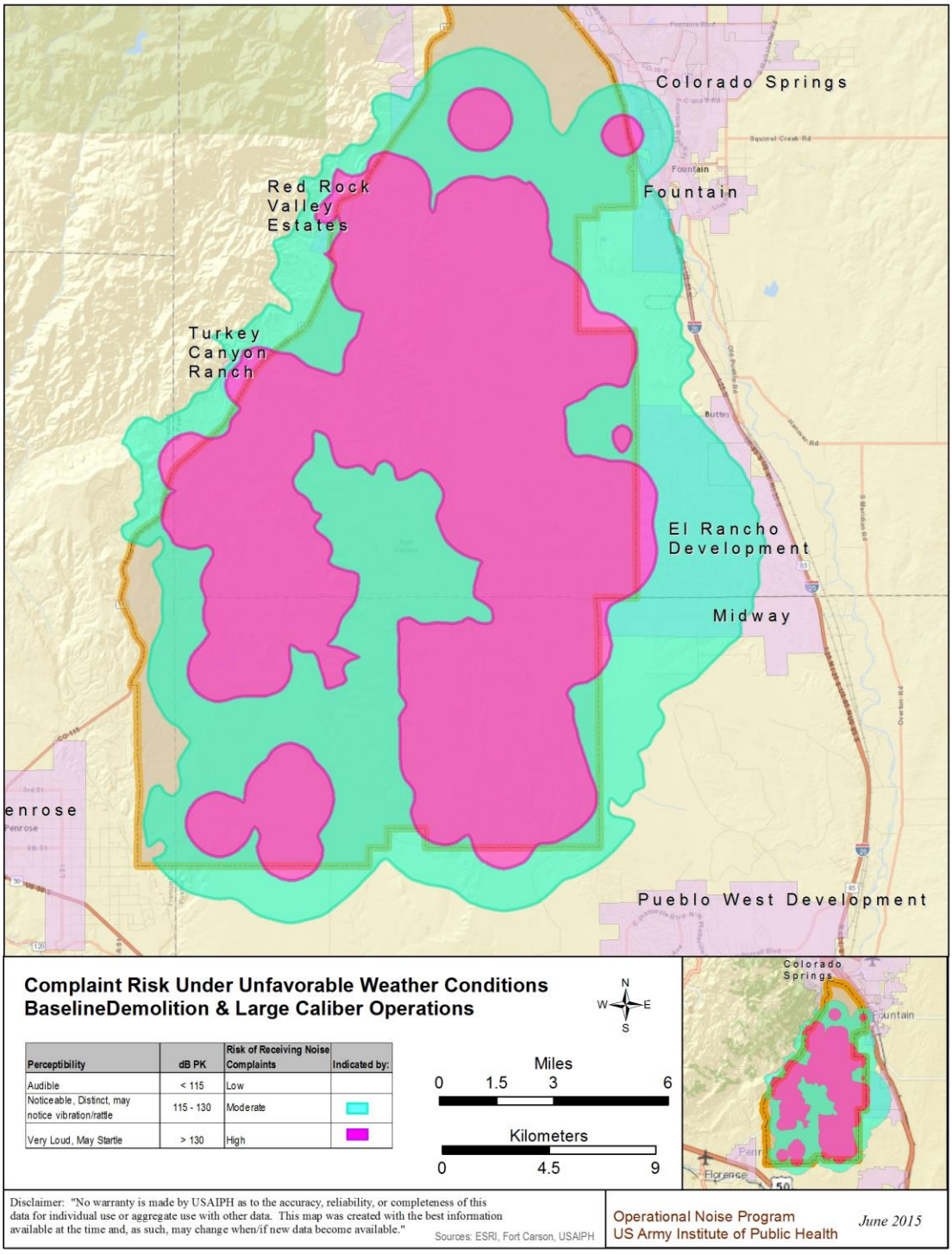

FIGURE 6. BASELINE CONDITIONS COMPLAINT RISK

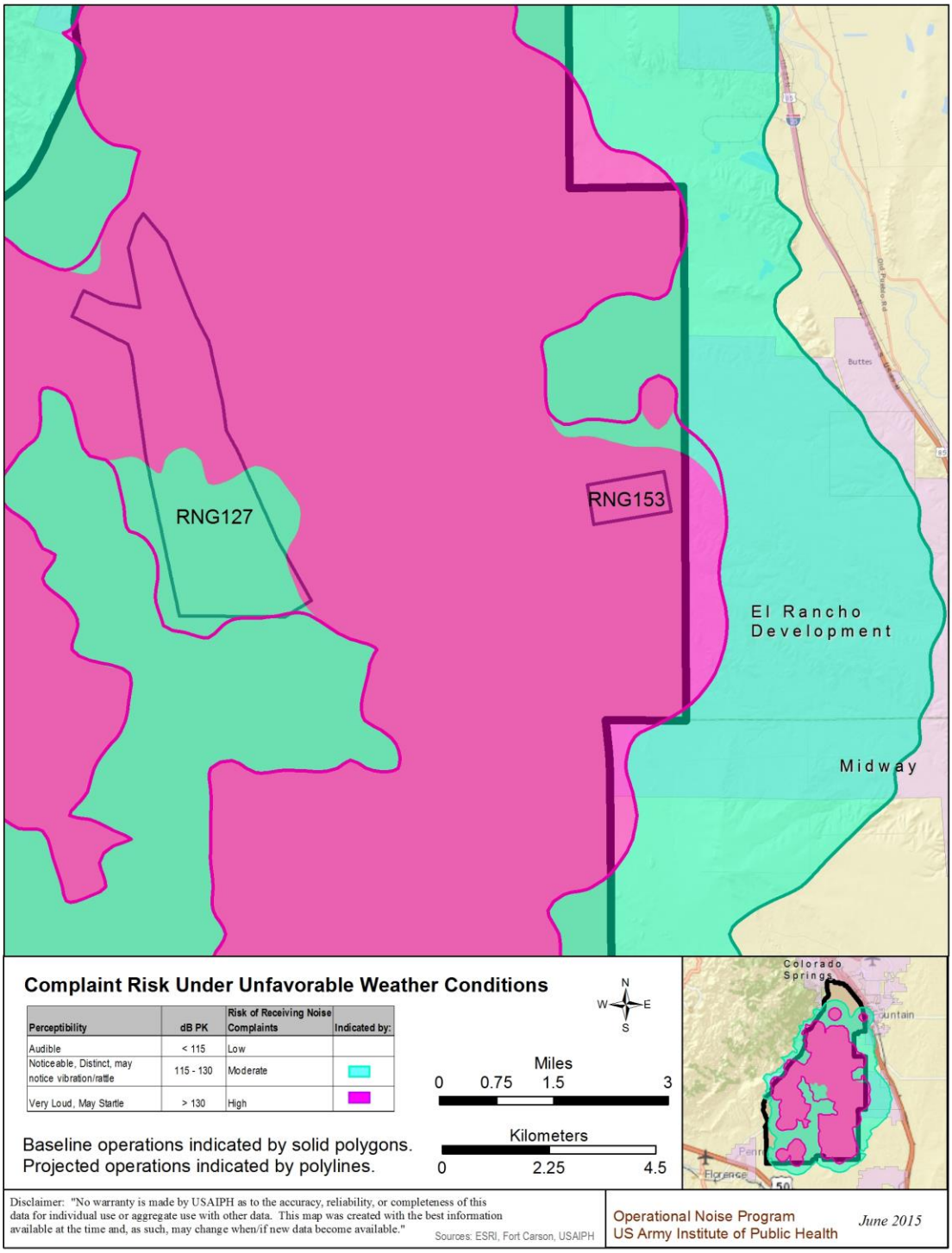

FIGURE 7. BASELINE VS PROJECTED CONDITIONS COMPLAINT RISK

d. 40mm Grenade Launcher.

(1) Range 153 activity includes firing of 40mm Target Practice (TP) rounds. Tables 8 and 9 contain the complaint risk criterion for the launch noise of the 40mm grenade launchers. The distances and levels represent a conservative approach and are based upon hearing conservation criteria (U.S. Army 1999) and a known measurement (U.S. Army 1984). This data represents the best available scientific quantification for assessing the complaint risk for the launch noise of the 40mm grenade launcher.

TABLE 8. COMPLAINT RISK TO THE SIDE OF THE 40MM GRENADE LAUNCHER, INERT ROUND

Risk of Complaints	**Distance from Grenade Launcher**	**Noise Level dBP**
Low	> 300 meters^	< 115 dB
Moderate	65 - 300 meters^	115 dB
High	< 65 meters^	>130 dB
Risk of hearing damage for unprotected ears	< 19 meters+	>140 dB

* *-- Inert is defined as any round that does not make noise upon impact, such as smoke, illum, TP*
^ *– Calculated value*
+ *– Known value, hearing conservation criteria.*

TABLE 9. COMPLAINT RISK TO THE REAR OF THE 40MM GRENADE LAUNCHER, INERT ROUND

Risk of Complaints	**Distance from Grenade Launcher**	**Noise Level dBP**
Low	> 110 meters^	< 115 dB
Moderate	25 - 110 meters^	115 dB
High	< 25 meters^	>130 dB
Risk of hearing damage for unprotected ears	< 7 meters+	>140 dB

* *-- Inert is defined as any round that does not make noise upon impact, such as smoke, illum, TP*
^ *– Calculated value*
+ *– Known value, hearing conservation criteria.*

(2) Based on the location of the Range 153 (380 meters from the boundary), the risk of complaints from the 40mm grenade launcher would be low.

e. Pyrotechnic/Simulators.

(1) Simulator noise levels may vary a few decibels depending on the type (i.e., artillery, ground burst, and grenade). Table 10 gives anticipated noise levels under average weather conditions and under weather conditions that favor sound propagation. We verified the BNOISE2 computed levels by comparing the results with data from multiple noise monitoring studies (U.S. Army 1983, U.S. Army 1984, U.S. Army 1989).

(2) Based on the levels below, under neutral weather conditions, the risk of complaints will be low beyond 500 meters. Under unfavorable weather conditions, such as during a temperature inversion, or when there is a strong wind blowing in the direction of the receiver, the distance increases to approximately 800 meters.

TABLE 10. PREDICTED PEAK NOISE LEVELS FOR TYPICAL ARMY SIMULATORS

Distance from source (meters)	Neutral Weather Conditions (PK50(met))	Unfavorable Weather Conditions (PK15(met))
100	134	136
200	125	130
300	120	127
400	117	123
500	114	121
600	111	118
700	109	116
800	107	114

(3) Based on the location of the Range 153 (380 meters from the boundary), there is a moderate risk of complaints from simulator activity.

f. Small Caliber Activity.

(1) General. Due to the remote nature of Range 127, it is not necessary to assess the small caliber weapons. Small caliber weapon noise remains within a few kilometers of the range. To assess the noise impact of the proposed expansion of Range 153, the small caliber ranges along the eastern boundary were included in the noise assessment (Figure 8).

(2) Baseline Conditions.

(a) Figure 9 shows the baseline small caliber weapons Noise Zones. Zone II extends less than a mile and the Zone III approximately 0.16 miles into the El Rancho Development.

(b) Table 11 lists the total acreage for each Noise Zone, as well as the acreage of those portions extending off the installation boundary. Table 12 lists the distance the off-post Noise Zones extend, the acreage within, and the general land use.

TABLE 11. SMALL CALIBER BASELINE CONDITIONS NOISE ZONE ACREAGE

Noise Zone	Total Acreage	Off-Post Acreage
Zone II	18,006	2,873
Zone III	3,780	100

TABLE 12. SMALL CALIBER BASELINE CONDITIONS – OFF-POST NOISE ZONE ACREAGE AND GENERAL LAND USE

Area	Noise Zone	Distance Beyond Boundary (meters)	Off-Post Acreage	Off-Post Land Uses/Functions
Area between Fountain & El Rancho	Zone II	< 1,400	1,552	Undeveloped
	Zone III	≈ 250	28	Undeveloped
		< 250	61	Undeveloped Just North of El Rancho
El Rancho & Midway Developments	Zone II	<1,400	1,321	Primarily Residential
	Zone III	< 200	11	Undeveloped

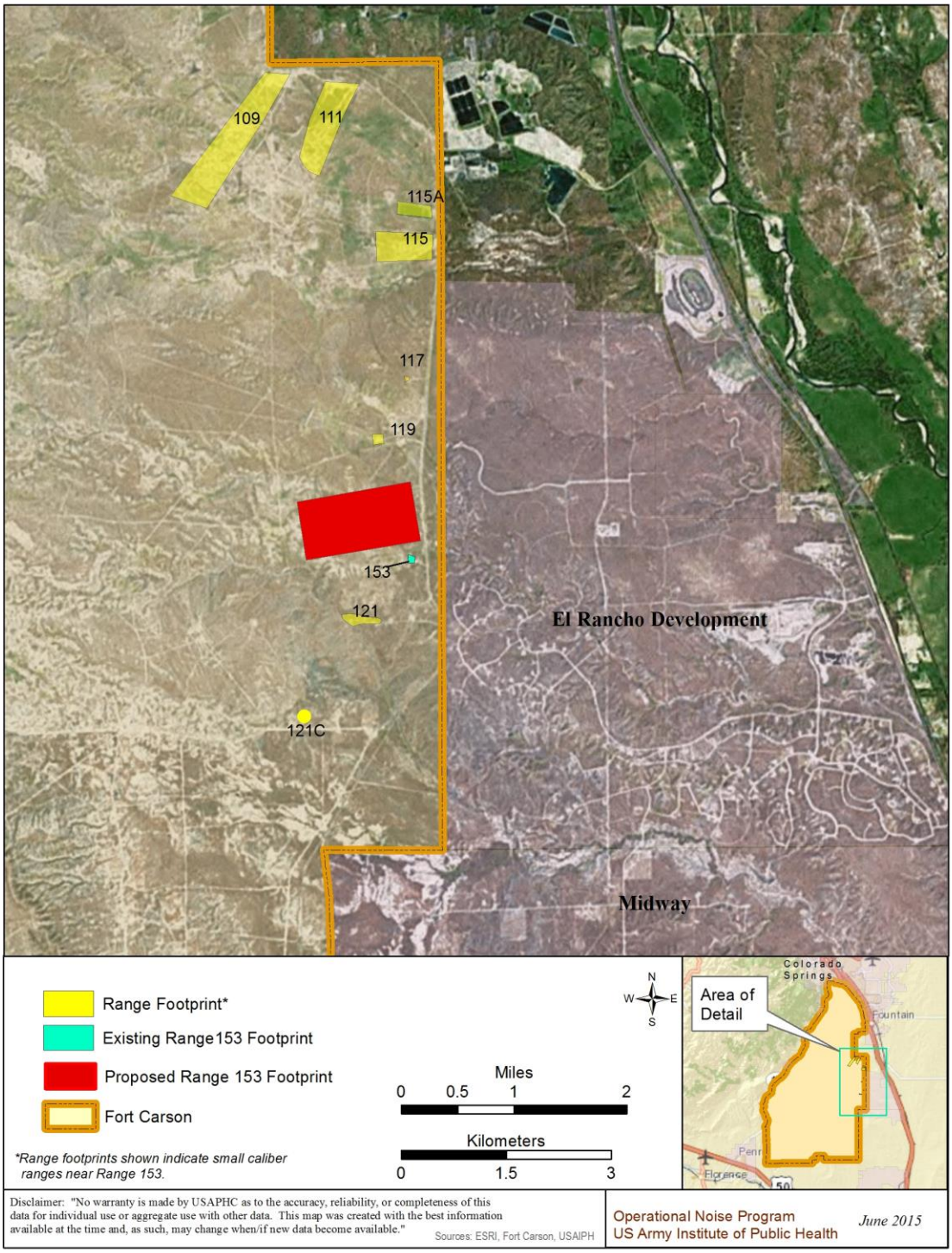

FIGURE 8. SMALL CALIBER RANGES NEAR RANGE 153 ISBC

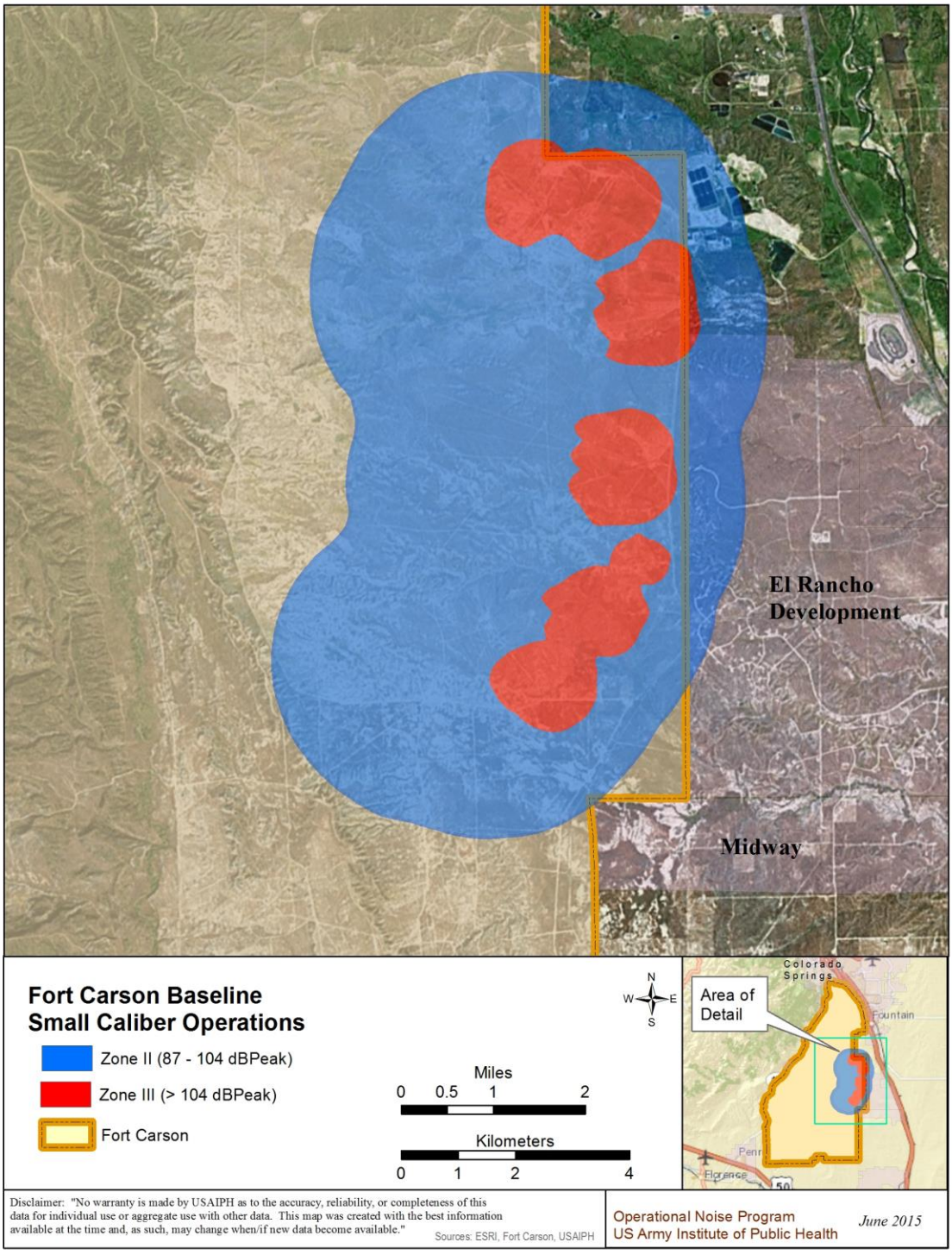

FIGURE 9. SMALL CALIBER NOISE ZONES BASELINE CONDITIONS

(3) Projected Conditions.

(a) Figure 10 shows the small caliber weapons Noise Zones for the proposed activity. Under the projected conditions, Zone II increases slightly near Range 153. The off-post Zone III remains unchanged. Zone II extends less than a mile and the Zone III approximately 0.16 miles into the El Rancho Development.

(b) Table 13 lists the total acreage for each Noise Zone, and the acreage of those portions extending off the installation. Table 14 lists the distance the off-post Noise Zones extend, the acreage within, and the general land use.

TABLE 13. SMALL CALIBER PROJECTED CONDITIONS NOISE ZONE ACREAGE

Noise Zone	Total Acreage	Off-Post Acreage
Zone II	18,023	3,004
Zone III	4,354	100

TABLE 14. SMALL CALIBER PROJECTED CONDITIONS – OFF-POST NOISE ZONE ACREAGE AND GENERAL LAND USE

Area	Noise Zone	Distance Beyond Boundary (meters)	Off-Post Acreage	Off-Post Land Uses/Functions
Area between Fountain & El Rancho	Zone II	< 1,400	1,552	Undeveloped
	Zone III	≈ 250	28	Undeveloped
		< 250	61	Undeveloped Just North of El Rancho
El Rancho & Midway Developments	Zone II	< 1,400	1,452	Primarily Residential
	Zone III	< 200	11	Undeveloped

(c) Figure 11 shows the baseline and projected small caliber weapons Noise Zones overlaid on an aerial and a street view of the El Rancho Development. Under projected conditions, off-post Zone III extends just beyond the boundary. Zone II increases from 1,321 (58 homes) to 1,451 acres (61 homes). Home count is from available imagery of structures that appear to be residential.

(d) The increased small caliber firing at Range 153 would increase the frequency of rounds audible by the El Rancho residents.

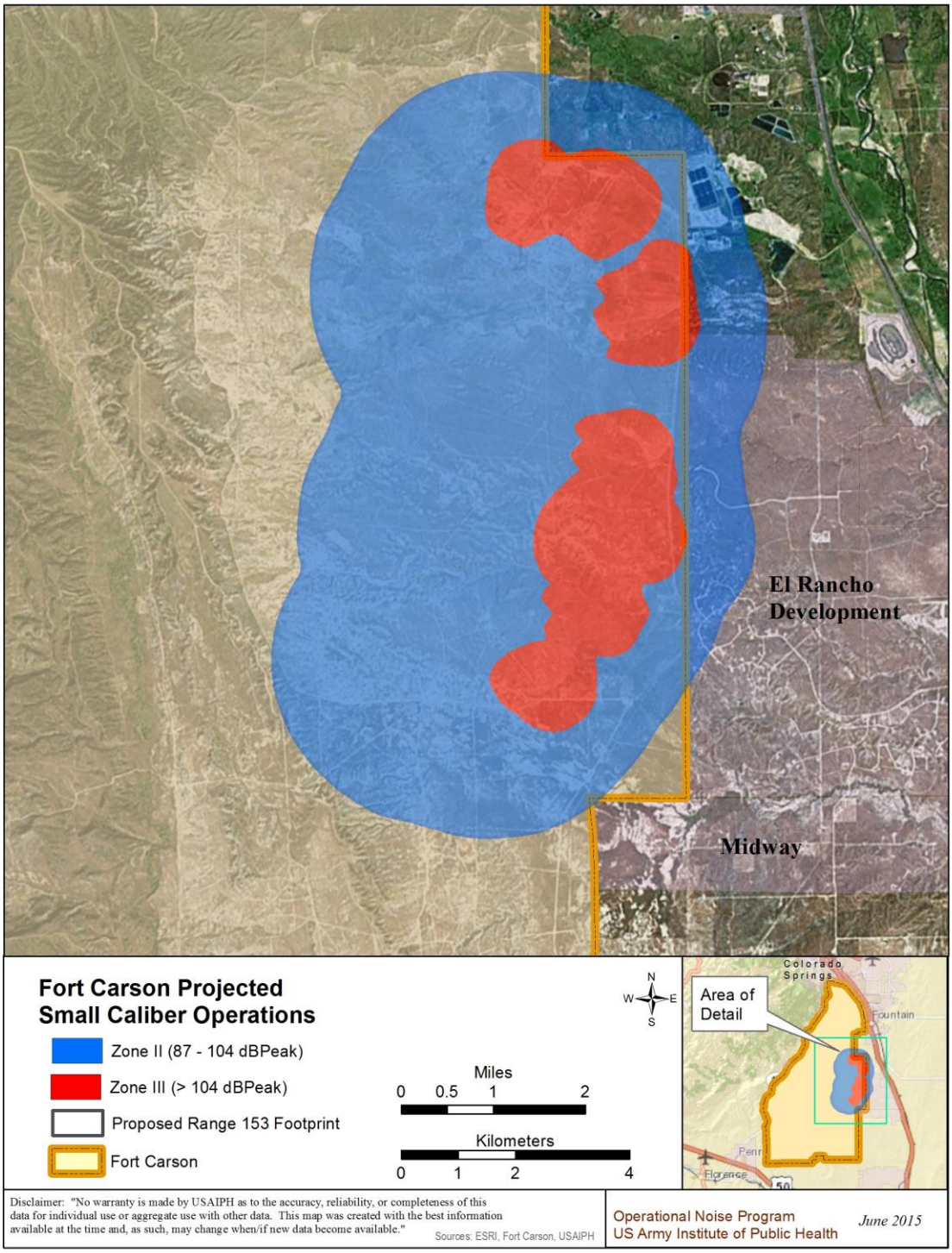

FIGURE 10. SMALL CALIBER NOISE ZONES PROJECTED CONDITIONS

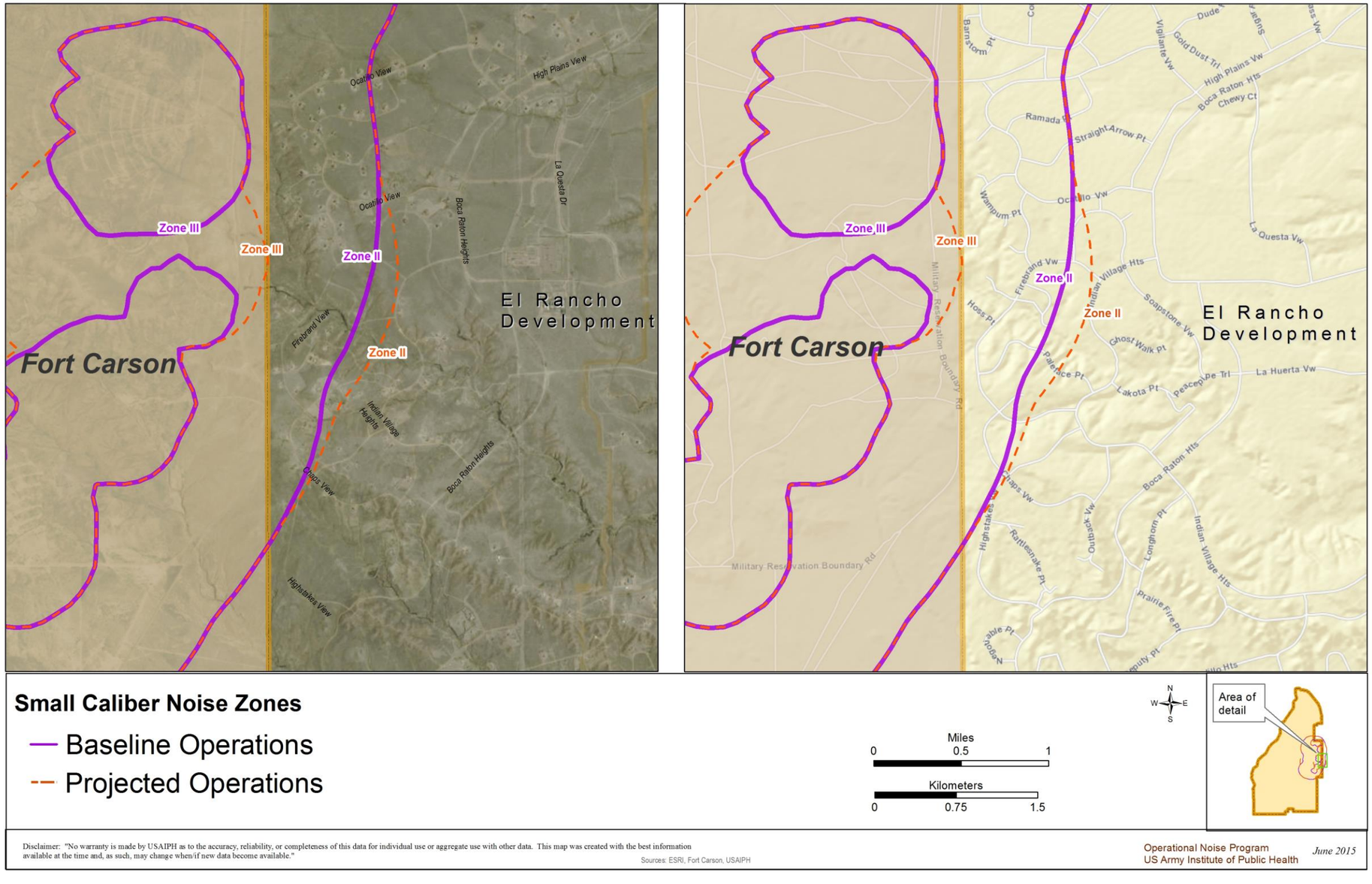

FIGURE 11. EL RANCHO AREA SMALL CALIBER NOISE ZONES

8. FINDINGS.

a. Demolition and Large Caliber Weapons.

(1) Under baseline and projected conditions, the Noise Zones encompasses multiple residential areas. Along the eastern boundary, the LUPZ extends towards Route 87. Zones II and III extend into the El Rancho Development. Along the western boundary, the LUPZ and Zone II extend into Turkey Canyon Ranch.

(2) The addition of the ISBC and IPBC ranges increases the overall size of the Noise Zones. Under the projected conditions, Zone III increases from 31 (5 homes) to 253 acres (21 homes) and Zone II from 2,086 (81 homes) to 2,979 acres (89 homes) in the El Rancho Development.

(3) Complaint risk guidelines indicate a moderate to high probability of receiving noise complaints for baseline and projected conditions.

b. Small Caliber Weapons.

(1) Under baseline and projected conditions, Zone II extends less than a mile into the El Rancho Development. Zone III extends slightly into an undeveloped area of El Rancho.

(2) The increased small caliber firing at Range 153 would increase the frequency of rounds audible by El Rancho residents.

9. RECOMMENDATIONS.

a. Fort Carson should continue to inform the local community of noise-producing activities.

b. Incorporate this consultation into the appropriate National Environmental Policy Act documents.

Kristy Broska

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Environmental Protection Specialist
Operational Noise

APPROVED:

Catherine Stewart

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Program Manager
Operational Noise

APPENDIX A

REFERENCES

1. U.S. Army 1983, Army Environmental Hygiene Agency, Environmental Noise Assessment No. 52-34-0415-83, Noise Levels from Machine Guns, Grenade and Artillery simulators from Training at Sudbury Annex, Fort Devens, MA, 23-24 March 1983.

2. U.S. Army, 1984, Army Environmental Hygiene Agency, Environmental Noise Assessment No. 52-34-0442-84, Noise Measurement Study, Camp Bullis, Texas, 27 February – 2 March 1984.

3. U.S. Army 1989, Army Environmental Hygiene Agency, Environmental Noise Assessment No. 52-34-0447-89, Results of Monitoring Edgewood Area Field Training Exercise Site, Aberdeen proving Ground, MD, June 1989.

4. U.S. Army, 1999, Center for Health Promotion and Preventive Medicine, Health Hazard Assessment Report on the 40mm XM1001 Canister Cartridge for the MK-19 Mod 3 Grenade Machine Gun, No. 69-37-2735-00, November 1999.

5. U.S. Army, 2003, Construction Engineering Research Laboratories, SARNAM Computer Model, Version 2.6. 2003-06-06.

6. U.S. Army, 2007, Army Regulation 200-1, Environmental Protection and Enhancement, Chapter 14 Operational Noise.

7. U.S. Army, 2009, Construction Engineering Research Laboratories, BNOISE2 Computer Model, Version 2009-11-30.

APPENDIX B

GLOSSARY OF TERMS, ACRONYMS & ABBREVIATIONS

B-1. GLOSSARY OF TERMS.

Average Sound Level – the mean-squared sound exposure level of all events occurring in a stated time interval, plus ten times the common logarithm of the quotient formed by the number of events in the time interval, divided by the duration of the time interval in seconds.

C-Weighted Sound Level – a quantity, in decibels, read from a standard sound level meter with C-weighting circuitry. The C-scale incorporates slight de-emphasis of the low and high portion of the audible frequency spectrum. It is used when measuring low frequency sound such as those from large arms, demolitions, and sonic booms.

Day-Night average sound Level (DNL) – the 24-hour average frequency-weighted sound level, in decibels, from midnight to midnight, obtained after addition of 10 decibels to sound levels in the night from midnight up to 7 a.m. and from 10 p.m. to midnight (0000 up to 0700 and 2200 up to 2400 hours).

Decibels (dB) – a logarithmic sound pressure unit of measure.

Land Use Planning Zone (LUPZ) – DNL noise contours represent an annual average that separates the Noise Zone II from the Noise Zone I for demolition and large caliber activity.

Noise – any sound without value.

Unfavorable Weather Conditions (PK15(met)) – the maximum value of the instantaneous sound pressure for each unique sound source, and factoring in the statistical variations caused by weather, that is likely to be exceeded only 15% of the time (i.e., 85% certainty that sound will be within this range). The PK15(met) levels would occur under weather conditions that enhance sound propagation.

B-2. GLOSSARY OF ACRONYMS AND ABBREVIATIONS.

AR	Army Regulation
BNOISE2	Blast Noise Impact Assessment
CDNL	C-weighted Day Night average sound Level
dB	decibel
dBP	decibel Peak
FY	Fiscal Year
IPBC	Infantry Platoon Battle Course
ISBC	Infantry Squad Battle Course
LUPZ	Land Use Planning Zone
SARNAM	Small Arms Range Noise Assessment Model
TP	Target Practice

APPENDIX C

DEMOLITION AND LARGE CALIBER EXPENDITURE

C-1. Not all of the firing points and ranges are used over the course of year. Which ranges are utilized varies from year to year depending upon training mission requirements, such as the type of training to be completed; the unit being trained; and deployment status. Therefore, an amalgamation of the activity occurring was created using Fiscal Years 2012 - 2014 (Table C-1). Inert 40mm grenades and pyrotechnic simulators that produce little to no noise (i.e., flash bang, illum, smoke) are not included in the land use noise analysis.

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
MP002	120mm Mortar, Inert	220	0	0	73	70	4
MP003	120mm Mortar, Inert	426	0	0	142	135	7
	60mm Mortar, He	3	0	0	1	1	0
	60mm Mortar, Inert	17	0	0	6	5	0
MP004	120mm Mortar, HE	199	0	70	90	85	4
	120mm Mortar, Inert	435	0	176	204	193	10
MP006	120mm Mortar, HE	0	0	30	10	10	1
	120mm Mortar, Inert	170	0	0	57	54	3
MP007	Missile, TOW, HE	7	0	0	2	2	0
MP009	81mm Mortar, HE	0	632	0	211	200	11
	60mm Mortar, HE	0	30	0	10	10	1
	60mm Mortar, Inert	0	123	0	41	39	2
MP014	120mm Mortar, Inert	0	0	84	28	27	1
	81mm Mortar, Inert	0	0	132	44	42	2
	60mm Mortar, HE	0	0	232	77	73	4
MP015	120mm Mortar, HE	100	587	0	229	218	11
	120mm Mortar, Inert	0	496	0	165	157	8
	81mm Mortar, Inert	100	0	0	33	32	2
MP016	120mm Mortar, HE	36	529	24	196	187	10
	120mm Mortar, Inert	0	366	101	156	148	8
	81mm Mortar, HE	151	972	353	492	467	25
	81mm Mortar, Inert	1130	501	105	579	550	29
	60mm Mortar, HE	659	395	248	434	412	22
	60mm Mortar, Inert	692	243	0	312	296	16
	Demolition, M023, C-4 1.25 lb	30	0	0	10	10	0
	Demolition, M032, TNT 1 lb	48	0	0	16	16	0
MP019	120mm Mortar, HE	0	0	95	32	30	2
	120mm Mortar, Inert	0	0	912	304	289	15
	81mm Mortar, HE	0	0	142	47	45	2
	81mm Mortar, Inert	0	0	177	59	56	3
	60mm Mortar, HE	0	0	66	22	21	1
	60mm Mortar, Inert	0	0	31	10	10	1

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
MP020	120mm Mortar, HE	0	110	0	37	35	2
	120mm Mortar, Inert	0	502	198	233	222	12
	81mm Mortar, HE	0	24	0	8	8	0
	60mm Mortar, HE	0	5	0	2	2	0
	60mm Mortar, Inert	0	3	0	1	1	0
MP024	120mm Mortar, HE	0	43	720	254	242	13
	120mm Mortar, Inert	0	255	1229	495	470	25
	81mm Mortar, HE	0	49	126	58	55	3
	81mm Mortar, Inert	0	226	137	121	115	6
	60mm Mortar, HE	0	0	80	27	25	1
	60mm Mortar, Inert	0	125	655	260	247	13
MP025	120mm Mortar, HE	61	329	367	252	240	13
	120mm Mortar, Inert	161	288	248	232	221	12
	81mm Mortar, He	0	58	96	51	49	3
	81mm Mortar, Inert	0	168	48	72	68	4
	60mm Mortar, HE	0	0	65	22	21	1
	60mm Mortar, Inert	0	0	330	110	105	6
MP026	120mm Mortar, HE	0	365	24	130	123	6
	120mm Mortar, Inert	0	575	407	327	311	16
	81mm Mortar, HE	0	314	72	129	122	6
	81mm Mortar, Inert	0	139	130	90	85	4
	60mm Mortar, Inert	0	230	246	159	151	8
MP027	120mm Mortar, HE	0	40	20	20	19	1
	120mm Mortar, Inert	0	144	56	67	63	3
MP101	120mm Mortar, HE	0	15	0	5	5	0
	120mm Mortar, Inert	0	196	0	65	62	3
	81mm Mortar, HE	0	58	0	19	18	1
	81mm Mortar, Inert	0	223	0	74	71	4
	60mm Mortar, Inert	0	289	0	96	92	5
MP102	120mm Mortar, HE	0	107	0	36	34	2
	120mm Mortar, Inert	0	300	0	100	95	5
	60mm Mortar, Inert	0	200	0	67	63	3

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
RG024	Demolition, M023, C-4 1.25 lb	21	5	0	9	9	0
RG035B	Grenade, Hand Frag M67	2704	1746	1288	1913	1913	0
RG060	Demolition Roll, M980, 0.5 lb per ft	0	0	7	2	2	0
	Demolition, M023, C-4 1.25 lb	10	0	49	20	20	0
RG060A	Demolition, M023, C-4 1.25 lb	0	0	40	13	13	0
RG103	Rocket, RPG-7 HE	0	0	10	3	3	0
	Rocket AT-4, 84mm HE	22	9	0	10	10	0
	Rocket LAW, 66mm HE	0	0	2	1	1	0
	Grenade Launcher, 40mm HE	349	2970	658	1326	1259	66
RG105	120mm Tank, Inert	1592	129	1939	1220	1220	0
	25mm Gun, Inert	25101	33178	5148	21142	21142	0
	Rocket AT-4, 84mm HE	35	0	0	12	12	0
RG109	120mm Tank, Inert	1489	93	0	527	369	158
	25mm Gun, Inert	18925	4049	0	7658	5361	2297
RG111	120mm Tank, Inert	810	113	0	308	215	92
	25mm Gun, Inert	31822	5601	0	12474	8732	3742
RG117	120mm Mortar, HE	0	0	330	110	105	6
	120mm Mortar, Inert	0	0	679	226	215	11
RG121	Cutter, ML04, TNT, 0.13 lb	0	16	0	5	5	0
	Demolition Roll, M060, 0.5 lb per ft	54	254	51	120	120	0
	Demolition, M023, C-4 1.25 lb	1828	2982	855	1888	1888	0
	Demolition, M028, Bangalore	1	0	0	0	0	0
	Demolition, M030, TNT 0.25 lb	3	0	0	1	1	0
	Demolition, M032, TNT 1 lb	40	49	0	30	30	0
	Linear Shaped Charge, M029, PETN, 0.86 lb	0	0	1	0	0	0
	Linear Shaped Charge, ML15, 0.5 lb per ft	0	64	4	23	23	0
	Linear Shaped Charge, MM50, 0.07 lb per ft	0	28	10	13	13	0
	Demolition, 155mm Howitzer, HE 15 lbs	7	21	12	13	13	0
	Demolition, 105mm Howitzer, Inert 3.3 lbs	0	0	1	0	0	0
	Demolition, 120mm Mortar, HE 7.9 lbs	0	2	1	1	1	0
	Demolition, 81mm Mortar, HE 2.4 lbs	17	0	0	6	6	0
	Demolition, 60mm Mortar, HE 0.9 lbs	14	0	0	5	5	0

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
RG121	Demolition, 120mm Tank, Inert 13.9 lbs	3	0	0	1	1	0
	Rocket, 2.75", Inert	0	4	0	1	1	0
RG121A	Demolition Kit, M757, C-4, 16 x 1.25 lb	0	430	0	143	143	0
	Demolition Roll, M060, 0.5 lb per ft	0	0	25	8	8	0
	Demolition Roll, M980, 0.5 lb per ft	65	116	3	61	61	0
	Demolition, M023, C-4 1.25 lb	3388	1814	3442	2881	2881	0
	Demolition, M028, Bangalore	30	11	105	49	49	0
	Demolition, M030, TNT 0.25 lb	430	0	0	143	143	0
	Demolition, M032, TNT 1 lb	450	55	200	235	235	0
	Demolition, M039, Cratering, 40 lb	56	29	104	63	63	0
	Demolition, M420, Shape Charge, 15 lbs	92	19	113	75	75	0
	Demolition, M421, Shape Charge, 40 lbs	9	24	2	12	12	0
	Destructor, M241, 0.29 lb	0	90	0	30	30	0
	Dynamite Military, M591 0.39 lb	73	24	24	40	40	0
	Linear Shaped Charge, MM30, 0.04 lb per ft	0	10	0	3	3	0
	MICLIC, HE	5	0	0	2	2	0
	Mine, Claymore, M18A1	21	0	65	29	29	0
	Demolition, 81mm Mortar, Inert 0.36 lb	0	44	0	15	15	0
	Demolition, 60mm Mortar, HE 0.9 lb	0	0	16	5	5	0
	Demolition, 60mm Mortar, Inert 0.08 lb	0	100	0	33	33	0
RG123	Demolition, M023, C-4 1.25 lb M112	58	70	133	87	87	0
	Demolition, M032, TNT 0.5 lb	0	12	6	6	6	0
	Demolition, M032, TNT 1 lb	0	0	10	3	3	0
	Demolition, M420, Shape Charge, 15 lbs	0	2	0	1	1	0
	Cutter, M485, 0.23 lb	0	8	0	3	3	0
	Linear Shaped Charge, ML16, 0.66 lb per ft	0	2	0	1	1	0
	Demolition, MN82, SEMTEX A, 0.5 lb	0	0	2	1	1	0
	20mm Gun, HE	0	0	797	266	146	120
	20mm Gun, Inert	8505	29610	38562	25559	14057	11502
	30mm Gun, Inert	11250	8100	2208	7186	3952	3234
	105mm Howitzer, Inert	0	0	33	11	6	5
	Rocket, 2.75" Inert	807	0	0	269	269	0

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
RG127A	120mm Mortar, Inert	60	0	0	20	20	0
	Missile, TOW, HE	0	0	10	3	3	0
RG129	Demolition, X673, Satchel Charge, 5 lb	0	56	0	19	19	0
	Demolition Roll, M980, 0.5 lb per ft	0	2	0	1	1	0
	Demolition, M028, Bangalore	0	0	20	7	7	0
	Demolition, M023, C-4 1.25 lb	0	10	137	49	49	0
	Linear Shaped Charge, X479, 0.5 lb per ft	0	66	0	22	22	0
	Mine, Claymore, M18A1	0	56	11	22	22	0
	Grenade Launcher, 40mm HE	0	56	0	19	19	0
	120mm Mortar, Inert	180	0	0	60	57	3
	81mm Mortar, HE	0	0	63	21	20	1
	81mm Mortar, Inert	0	0	17	6	5	0
	60mm Mortar, HE	48	0	700	249	237	12
	60mm Mortar, Inert	47	27	267	114	108	6
	Rocket, AT-4, 84mm HE	0	21	0	7	7	0
	Rocket, LAW, 66mm, HE	0	5	0	2	2	0
RG131B	Demolition, M028, Bangalore	20	0	4	8	8	0
	Demolition, M023, C-4 1.25 lb	26	0	30	19	19	0
	Demolition, M420, Shape Charge, 15 lbs	6	0	0	2	2	0
	120mm Mortar, Inert	0	75	0	25	24	1
	81mm Mortar, HE	0	150	0	50	48	3
	81mm Mortar, Inert	97	440	35	191	181	10
	60mm Mortar, HE	0	350	26	125	119	6
	60mm Mortar, Inert	60	213	58	110	105	6
	Missile, Javelin, HE	0	0	2	1	1	0
RG131C	Demolition Roll, M980, 0.5 lb per ft	7	113	130	83	83	0
	Demolition, ML49, TNT, 1 lb	0	0	2	1	1	0
	Demolition, M023, C-4 1.25 lb	23	1	3	9	9	0
RG131D	105mm Howitzer, Inert	0	80	80	53	29	24
RG135	60mm Mortar, HE	0	0	64	21	20	1
RG139	Rocket, RPG-7 HE	0	0	73	24	24	0
	Rocket AT-4/RAAWS, 84mm HE	354	392	110	285	285	0

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
RG139	Rocket SMAW, 83mm HE	6	0	4	3	3	0
	Rocket LAW, 66mm HE	18	27	0	15	15	0
	Rocket LAW, Training M72AS	908	0	213	374	374	0
	Grenade Launcher, 40mm HE	0	124	0	41	41	0
RG141	Missile, MLRS, Inert	30	0	0	10	10	0
RG141A	120mm Mortar, HE	596	56	80	244	232	12
	120mm Mortar, Inert	1074	81	40	398	378	20
	81mm Mortar, HE	66	207	0	91	86	5
	81mm Mortar, Inert	134	177	0	104	98	5
	60mm Mortar, HE	273	121	128	174	165	9
	60mm Mortar, Inert	160	154	152	155	148	8
	Grenade Launcher, 40mm HE	4732	32	500	1755	1667	88
	Rocket, AT-4, 84mm HE	0	47	0	16	16	0
	Rocket, SMAW, 83mm HE	0	8	0	3	3	0
	Rocket, LAW, 66mm HE	0	2	6	3	3	0
	Missile, MLRS, Inert	1379	0	0	460	460	0
	Missile, TOW, HE	0	0	8	3	3	0
	155mm Howitzer, HE	184	121	55	120	96	24
	105mm Howitzer, HE	0	44	0	15	12	3
	25mm Gun, Inert	410	0	914	441	441	0
	Demolition, M023, C-4 1.25 lb	1	0	5	2	2	0
RG143	Rocket, 2.75" HE	0	0	23	8	8	0
	Rocket, 2.75" Inert	128	814	4011	1651	1651	0
	25mm Gun, Inert	8989	5566	15885	10147	7103	3044
	30mm Gun, Inert	900	7232	29289	12474	8732	3742
	120mm Tank, Inert	1556	2375	1580	1837	1286	551
	155mm Howitzer, HE	26	0	0	9	6	3
	120mm Mortar, HE	28	0	0	9	7	3
	120mm Mortar, Inert	1	0	0	0	0	0
	Demolition, M023, C-4 1.25 lb	11	0	0	4	4	0
RG145	Rocket, 2.75" Inert	0	0	480	160	160	0
	155mm Howitzer, HE	0	0	84	28	22	6

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
RG145	120mm Mortar, HE	0	0	36	12	11	1
	120mm Mortar, Inert	0	0	24	8	8	0
	120mm Tank, Inert	288	915	805	669	469	201
	25mm Gun, Inert	0	7892	13484	7125	4988	2138
	30mm Gun, Inert	0	0	192	64	45	19
RG150	Demolition Roll, M060, 0.5 lb per ft	88	453	0	180	180	0
	Demolition, M023, C-4 1.25 lb	1	117	0	39	39	0
RG153	120mm Tank, Inert	0	0	576	192	134	58
	25mm Gun, Inert	0	0	2970	990	693	297
RG155	120mm Mortar, HE	198	104	0	101	96	5
	120mm Mortar, Inert	265	344	16	208	198	10
	120mm Tank, Inert	912	833	750	832	582	250
	25mm Gun, Inert	8363	8245	20730	12446	8712	3734
	30mm Gun, Inert	0	0	48	16	11	5
	Demolition, M028, Bangalore	0	0	108	36	36	0
	Demolition, M023, C-4 1.25 lb	48	5	128	60	60	0
	155mm Howitzer, HE	283	0	22	102	81	20
	Rocket, 2.75" Inert	320	0	120	147	147	0
	Missile, TOW, HE	20	0	30	17	17	0
	Missile, TOW, Inert	20	6	0	9	9	0
RG159	Demolition Roll, M980, 0.5 lb per ft	0	5	0	2	2	0
RG161	Demolition, M023, C-4 1.25 lb	15	34	0	16	16	0
RG165	Demolition, M023, C-4 1.25 lb	0	90	0	30	30	0
SMP129	155mm Howitzer, HE	0	0	9	3	2	1
	155mm Howitzer, Inert	0	0	10	3	2	2
	120mm Mortar, HE	320	0	0	107	101	5
	120mm Mortar, Inert	170	0	0	57	54	3
	81mm Mortar, HE	163	180	0	114	109	6
	81mm Mortar, Inert	20	0	0	7	6	0
	60mm Mortar, HE	276	96	0	124	118	6
SMP153	120mm Mortar, HE	32	0	0	11	10	1
	120mm Mortar, Inert	480	0	0	160	152	8

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
SMP153	81mm Mortar, HE	48	0	0	16	15	1
	81mm Mortar, Inert	72	0	0	24	23	1
	60mm Mortar, HE	51	0	0	17	16	1
	60mm Mortar, Inert	89	0	0	30	28	1
TA09	155mm Howitzer, HE	8	0	0	3	2	1
	155mm Howitzer, Inert	6	0	0	2	2	0
TA11	155mm Howitzer, HE	0	16	107	41	33	8
	155mm Howitzer, Inert	0	3	0	1	1	0
TA12	Rocket, MLRS, Inert	0	72	84	52	52	0
	155mm Howitzer, HE	0	12	12	8	6	2
	155mm Howitzer, Inert	0	5	0	2	1	1
	105mm Howitzer, HE	0	778	0	259	207	52
	75mm Salute Cannon, Inert	0	0	25	8	8	0
TA14	155mm Howitzer, HE	275	0	856	377	302	75
	105mm Howitzer, HE	0	75	0	25	20	5
TA16	155mm Howitzer, HE	1168	864	811	948	758	190
	155mm Howitzer, Inert	241	50	85	125	69	56
	105mm Howitzer, HE	0	192	0	64	51	13
TA17	155mm Howitzer, HE	0	0	82	27	22	5
	105mm Howitzer, HE	0	107	0	36	29	7
TA18	155mm Howitzer, HE	0	827	342	390	312	78
	155mm Howitzer, Inert	0	66	6	24	13	11
TA21	155mm Howitzer, HE	69	0	0	23	18	5
	155mm Howitzer, Inert	7	0	0	2	2	0
TA24	155mm Howitzer, HE	176	105	360	214	171	43
	155mm Howitzer, Inert	0	81	206	96	53	43
	105mm Howitzer, HE	0	58	0	19	15	4
TA28	Demolition Roll, M060, 0.5 lb per ft	0	50	0	17	17	0
	Demolition, M023, C-4 1.25 lb	0	45	0	15	15	0
TA30	155mm Howitzer, HE	1044	0	451	498	399	100
	155mm Howitzer, Inert	42	0	29	24	13	11
TA31	155mm Howitzer, HE	178	0	484	221	177	44
	155mm Howitzer, Inert	52	0	21	24	13	11

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

TABLE C-1. BASELINE CONDITIONS NOISE ZONE INPUTS, cont'd

Facility	Nomenclature	Quantity Fired			Three Year Average	Noise Zone Inputs	
		FY 2012	FY 2013	FY 2014		Daytime (0700-2200)	Nighttime (2200-0700)
TA36	155mm Howitzer, HE	0	0	127	42	34	8
	155mm Howitzer, Inert	0	0	49	16	9	7
TA39	155mm Howitzer, HE	85	0	0	28	23	6
TA40	155mm Howitzer, HE	191	0	60	84	67	17
	155mm Howitzer, Inert	150	0	0	50	40	10
TA41	Demolition Roll, M060, 0.5 lb per ft	0	826	0	275	275	0
	Demolition, M023, C-4 1.25 lb	95	159	0	85	85	0
TA47	Rocket, MLRS, Inert	0	6	0	2	2	0
TA49	155mm Howitzer, HE	38	285	148	157	126	31
	155mm Howitzer, Inert	30	21	67	39	22	18
TA50	155mm Howitzer, HE	37	0	44	27	22	5
	155mm Howitzer, Inert	6	0	0	2	2	0
TA51	155mm Howitzer, HE	0	188	24	71	57	14
	155mm Howitzer, Inert	0	90	0	30	17	14
TA54	155mm Howitzer, HE	0	22	0	7	6	1
TA55	155mm Howitzer, HE	0	16	0	5	4	1
	155mm Howitzer, Inert	0	4	0	1	1	1

Inert is defined as any round that does not make noise upon impact (i.e, smoke, illum, TP-T, etc...)

C-2. The projected Noise Zones are based on the baseline expenditure listed in Table C-1 (minus the existing Range 153 activity) and the proposed activity listed in Table C-2.

TABLE C-2. FUTURE ESTIMATED AMMUNITION EXPENDITURE NOISE ZONE INPUTS

Facility	Nomenclature	Annual Expenditure	Daytime (0700-2200)	Nighttime (2200-0700)
Range 127	Missile, TOW, Inert	12	12	0
	Demolition, M028, Bangalore	30	30	0
	Demolition, M023, C-4 1.25 lb	150	150	0
	120mm Tank, Inert	700	490	210
	25mm Gun, Inert	16000	11200	4800
Range 153	Demolition, M028, Bangalore	30	30	0
	Demolition, M023, C-4 1.25 lb	100	100	0
	120mm Tank, Inert	500	350	150
	25mm Gun, Inert	16000	11200	4800

Inert is defined as any round that does not make noise upon impact (i.e. Illum, Smoke, WP, TP-T, etc..)

APPENDIX D

SMALL CALIBER EXPENDITURE

D-1. Although small caliber activity is assessed via peak noise levels, the Table lists the annual expenditure for reference. Daily training and troop qualification activities on the ranges can be a common occurrence.

D-2. To assess the noise impact of the proposed expansion of Range 153, only those small caliber ranges along the eastern boundary were included in the noise assessment. Under the proposed conditions, there is no change to the type of ammunition used at Range 153.

TABLE D. SMALL CALIBER EXPENDITURE

		Quanity Fired		
Facility	Nomenclature	FY 2012	FY 2013	FY 2014
RG109	9mm	1900	0	0
	300 Win Mag	710	0	0
	5.56mm	42960	16830	0
	5.56mm Blank	0	3600	0
	7.62mm	347402	67936	0
	7.62mm Blank	0	2400	400
	.50 caliber	176562	48896	0
	.50 caliber, Blank	0	0	200
RG111	5.56mm	11400	17000	0
	7.62mm	290939	50400	0
	7.62mm Blank	4570	0	0
	.50 caliber	132149	120251	0
	.50 caliber, Blank	6100	0	0
RG115A	9mm	7465	15071	0
	5.56mm	65935	44849	18192
RG115B	9mm	8800	2000	0
	300 Win Mag	400	300	0
	5.56mm	419760	189226	9637
	5.56mm Blank	0	7200	0
	7.62mm	289150	174172	17994
	7.62mm Blank	0	3000	0
	.50 caliber	227010	74778	0

TABLE D. SMALL CALIBER EXPENDITURE, cont'd

		Quanity Fired		
Facility	Nomenclature	FY 2012	FY 2013	FY 2014
RG117	9mm	8500	0	0
	5.56mm	127735	15890	0
	5.56mm Blank	14346	0	0
	7.62mm	49985	0	0
	7.62mm Blank	4104	0	0
RG119	9mm	0	0	75
	300 Win Mag	0	0	1659
	5.56mm	589839	723382	414281
	5.56mm Blank	0	0	200
	7.62mm	579733	499689	628694
	.50 caliber	0	416059	513781
	.50 caliber, Blank	0	0	300
	12.7 x 108mm	0	500	0
RG121	9mm	0	300	0
	5.56mm	0	400	0
	5.56mm Blank	0	0	3100
	7.62mm	0	0	30
	7.62mm Blank	0	800	1500
	.50 caliber	0	30	0
	.50 caliber, Blank	0	100	0
RG121C	9mm	14300	8550	2000
	300 Win Mag	27086	14963	510
	.338 caliber	0	120	200
	5.56mm	96211	244782	331078
	5.56mm Blank	0	3200	0
	7.62mm	168252	274469	596256
	7.62mm Blank	0	0	216
	.50 caliber	54533	153271	503370
	.50 caliber Blank	0	0	43
RG153	300 Win Mag	434	0	0
	5.56mm	4515	21128	19898
	5.56mm Blank	0	3120	18204
	7.62mm	1671	0	27390
	7.62mm Blank	0	0	16534
	.50 caliber	0	0	5100
	9mm, AT-4 Trainer	0	4601	715