DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
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WASHINGTON DC 20350-3000

MCO 3550.13
I&L (LF)
27 APR 2021

MARINE CORPS ORDER 3550.13

From: Commandant of the Marine Corps
To: Distribution List

Subj: RANGE COMPATIBLE USE ZONES (RCUZ) PROGRAM

Ref: See Enclosure (1)

Encl: (1) References
(2) RCUZ Program Responsibilities, Procedures, and Guidelines

1. Situation

a. This Order establishes responsibilities, policies, and procedures for the U.S. Marine Corps RCUZ Program, replacing the Range Air Installations Compatible Use Zone (RAICUZ) Program. The RCUZ Program is designed to protect the public health, safety, and welfare, and to prevent encroachment from degrading the operational capabilities of Range and Training Areas (RTAs), to encompass air-to-ground (A-G), ground-to-ground (G-G), ground-to-air (G-A), and laser ranges.

b. The Marine Corps developed the RAICUZ program for A-G ranges, but the principles and objectives of the RAICUZ program also conceptually apply to G-G, G-A, and laser ranges. The Marine Air-Ground Task Force (MAGTF) is a combined arms force, which requires a holistic and consistent approach to preventing encroachment from degrading the operational capabilities of RTAs. A range is defined in reference (a) and includes associated airspace areas designated for military use by the Federal Aviation Administration (FAA).

c. This Order provides a single policy for the determination of compatible land use recommendations for all Marine Corps installation ranges, per references (a) through (e), and to encourage implementation of Range Compatibility Zone (RCZ) and noise zone recommendations through engagement with local communities, governments, and other stakeholders to prevent incompatible development of land near military training ranges.

d. This Order is a complete revision of the previous variations, and creates a new program; therefore it should be reviewed in its entirety. Enclosure (2) contains detailed procedures and guidelines. Reference (b) addresses technical range safety standards and guidelines applied by the Marine Corps RCUZ Program.

2. Cancellation. MCO 3550.11

3. Mission

a. The RCUZ program is established to guide land use recommendations in the vicinity of RTAs to support current and future Marine Corps training, testing, and operational requirements and to protect the public health, safety, and welfare of Marines, Sailors, their families, and the general public. This is accomplished through the development of, and periodic updates to, RCUZ studies, establishment of RCZs, and noise analysis for aircraft operations as well as A-G, G-A, and G-G ordnance firing, with or without laser use, with the resulting weapons impact and detonation.

b. The RCUZ Program identifies RCZs, based on a composite of Surface Danger Zones (SDZs), Weapons Danger Zones (WDZs), and Laser Surface Danger Zones (LSDZs), and additional protections for safe ordnance delivery and aircraft overflight. Reference (b) establishes Marine Corps range safety policies and addresses the establishment of SDZ, WDZ, and LSDZ, all of which can be created through tools in the Range Manager's Tool Kit (RMTK). SDZs and WDZs identify hazardous areas that result from the firing and/or delivery of weapons and ordnance on all Marine Corps ranges, and LSDZs depict where laser radiation levels may exceed maximum permissible exposure levels, thereby requiring control during laser operations.

c. The RCUZ Program requires that the Installation Commander's Encroachment Management Program work to prevent incompatible land uses adjacent to military training ranges. These land areas are typically identified as part of an installation RCUZ study (or other installation planning study) and can be addressed with encroachment management tools discussed in Enclosure (2) and reference (c).

4. Execution

a. Commander's Intent and Concept of Operations

(1) Commander's Intent. All Marine Corps installation ranges shall establish and implement an RCUZ Program to protect the operational capabilities of RTAs, to encompass A-G, G-G, G-A, and laser ranges to protect the public health, safety, and welfare, and to prevent encroachment from degrading the operational capabilities of RTAs in accordance with this Order. This includes developing, and periodically updating, an RCUZ study; establishing RCZs and noise contours; and implementing the RCUZ land use compatibility recommendations with internal and external stakeholders to protect the public safety, health, and welfare.

(2) Concept of Operations

(a) The RCUZ Process involves three steps:

1. Develop, and periodically update, an RCUZ study for each RTA as outlined in this Order in accordance with Enclosure (2). RCUZ studies analyze existing range utilization and are informed by the installation Range Complex Management Plan (RCMP) to capture known or emerging training requirements that may affect range utilization, such as new weapon systems or platforms with a planned initial operational capability (IOC) within the next ten years to the extent practicable. This must include an accurate assessment of laser weapons use and compatibility with existing range certifications.

2. Identify critical areas within the RCUZ footprint on and off installation where actions are required to assure land use compatibility within the RCZ and noise contours using the installation master plan, RCMP, natural and cultural resource plans, Encroachment Control Plan (ECP), local government land use controls, acquisition, or other mitigations to achieve compatibility with the RCUZ footprint.

3. Implement the RCUZ as detailed in Enclosure (2) and as part of the installation's encroachment management program in accordance with reference (c) to achieve compatible land use within the RCUZ footprint using encroachment partnering projects, land use controls, acquisition, or other mitigation strategies. This includes incorporating RCUZ land use, mitigation, and project recommendations into installation master plans in accordance with references (q) and (r) and working with internal and external stakeholders to promote compatible land use within those areas affected by the RCUZ study and to maintain public awareness of RCUZ.

(b) RCUZ studies will be prepared for all Marine Corps installations with RTAs within the confines of the United States, its territories, trusts, and possessions. RCUZ studies, or portions thereof, may be prepared for U.S. activities in foreign countries if such action supports host nation policy for protecting the operational capabilities of those activities, or for Marine Corps facility planning on-base. However, this Order will be implemented in foreign countries only to the extent the requirements of the Order do not contravene existing Status of Forces Agreements (SOFAs) or other treaties/executive agreements with a Host nation or otherwise contravene mandatory policy guidance issued by a joint command or sub-unified command.

(c) Marine Corps Installations Command (MCICOM) (G-7) will administer the requirements and ensure the accuracy, modification, and distribution of this Order.

(d) Existing approved RAICUZ and RCUZ studies remain valid until updated in accordance with this Order.

b. Enclosure (2) assigns RCUZ program execution roles and responsibilities.

c. Coordinating Instructions

(1) The terms "shall," "will," and "must" as used in this Order are directive and require compliance. Words such as "may," "should," and "can" are advisory and permissive in nature, but do not require compliance.

(2) Requests for deviations from any of the provisions of this Order must be submitted to MCICOM (G-7) via the appropriate chain of command.

5. Administration and Logistics

a. Recommendations. Submit all recommendations concerning this Order to MCICOM (G-7) via the appropriate chain of command.

b. Records Management. Records created as a result of this directive shall be managed according to National Archives and Records Administration (NARA)-approved dispositions per SECNAV M-5210.1 CH-1 to ensure proper maintenance, use, accessibility and preservation, regardless of format or

medium. Records disposition schedules are located on the Department of the Navy/Assistant for Administration (DON/AA), Directives and Records Management Division (DRMD) portal page at: https://portal.secnav.navy.mil/orgs/DUSNM/DONAA/DRM/Records-and-Information-Management/Approved%20Record%20Schedules/Forms/AllItems.aspx. Refer to MCO 5210.11F for Marine Corps records management policy and procedures.

c. Privacy Act. Any misuse or unauthorized disclosure of Personally Identifiable Information (PII) may result in both civil and criminal penalties. The Department of the Navy (DON) recognizes that the privacy of an individual is a personal and fundamental right that shall be respected and protected. The DON's need to collect, use, maintain, or disseminate PII about individuals for purposes of discharging its statutory responsibilities shall be balanced against the individuals' right to be protected against unwarranted invasion of privacy. All collection, use, maintenance, or dissemination of PII shall be in accordance with the Privacy Act of 1974, as amended (5 U.S.C. 552a) and implemented per SECNAVINST 5211.5F.

6. Command and Signal

a. Command. This Order is applicable to the Marine Corps Total Force.

b. Signal. This Order is effective the date signed.

CHARLES G. CHIAROTTI
Deputy Commandant for
Installations and Logistics

Distribution: PCN 10235501200

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References

(a) 10 U.S.C. 101
(b) MCO 3570.1C
(c) MCO 11011.23A
(d) MCO 3550.10
(e) MCO 5090.2
(f) OPNAVINST 3770.2L
(g) 49 U.S.C. 40103, 44718
(h) SECNAV M-5210.1
(i) MCRP 8-10B.1
(j) MCO 11011.16
(k) Unified Facilities Criteria 3-260-1 Airport and Heliport Planning and Design Criteria
(l) MCO P11000.14 W/CH 1
(m) DoDI 4715.13
(n) MCO 11000.25A
(o) SECNAVINST 11011.47D
(p) 10 U.S.C. § 2684a
(q) MCO 11000.12
(r) Unified Facilities Criteria 2-100-01 Installation Master Planning
(s) Unified Facilities Criteria 3-201-01 Civil Engineering

RCUZ Program Responsibilities, Procedures, and Guidelines

Chapter 1

RCUZ Program and Objectives

1. The RCUZ Program Objectives. The purpose of the RCUZ program is to promote land use and airspace compatibility within the range environs both on-base and off-base by:

a. Minimizing public exposure to hazards and noise associated with operations in Marine Corps Range and Training Areas (RTAs) to protect the public health, safety and welfare;

b. Protecting Marine Corps investment by safeguarding current and potential operational capabilities of the RTAs;

c. Promoting compatible land use within RCZs and noise contours to the maximum extent practicable;

d. Informing the public about the RCUZ program and seeking cooperative efforts to minimize incompatible land use and competition for airspace;

e. Establishing and maintaining working relationships between Commanding Officers and Commanding Generals of Marine Corps Installations (MCIs) and local, regional, and territorial and state community councils and commissions; Native American Indian tribes; Native Hawaiian Organizations; and planning and zoning organizations. Contribute to mutual communications within these relationships regarding proposed actions that could affect public health, safety, and welfare as well as operational and training capabilities and compatible land use recommendations within the RCUZ footprint.

2. The RCUZ Program Process. The process to implement the RCUZ program objectives at an installation includes:

a. Developing, and periodically updating, an RCUZ Study. RCUZ studies include a detailed analysis of current and future range utilization, special use airspace, range compatibility use zones, aircraft noise, ordnance noise, and land use compatibility. Chapter 4 provides details on the RCUZ study contents and required range safety and noise analyses.

(1) The development of an RCUZ study requires establishing RCZs as described in Chapter 4. RCZ I is a composite Weapons Danger Zone (WDZ)/Surface Danger Zone (SDZ)/Laser Surface Danger Zone (LSDZ) footprint for all authorized range operations. RCZ-II defines the area of aircraft armed over-flight. RCZ-III defines the area within the designated Special Use Airspace (SUA) associated with the RTA outside of the areas designated as RCZ I and RCZ II.

(2) The RCUZ study also requires modeling and establishing noise contours for exposure to aircraft noise and blast noise from A-G, G-G, and G-A weapons. Chapter 4 describes the standards for developing the RCUZ noise contours.

(3) Conducting Technical Reviews. Plans shall be updated as necessary to account for new aircraft, weapons, and/or tactics or when

special circumstances, such as an approved training requirement, dictate such action. Installations must conduct a Technical Review if new or changed operations, RTA requirements, weapons systems or platforms, or other circumstances determine the need to update the RCUZ study. The internal technical assessment (outlined in Chapter 4) of operational data identifies range utilization and any known or emerging training requirements that may affect range utilization, such as new weapons systems and platforms with a planned initial operational capability within the next ten years, to the extent practicable. Technical reviews and range safety standards are not intended for public release.

b. Identifying critical areas within the RCUZ footprint where actions are required to ensure land use compatibility on and off installation. These areas and associated recommended actions should also be incorporated into installation master planning, RCMPs, natural and cultural resource management plans, encroachment partnering planning, and local planning efforts.

c. Implementing and Monitoring the RCUZ. Implementation of the RCUZ program both on- and off-installation (outlined in Chapter 6) requires coordination with federal, state, and local governments as part of the installation's encroachment management program. Outreach and engagement helps to maintain public awareness of the RCUZ program and promote compatible use of land within the RCUZ footprint. RCUZ implementation may also include, where necessary, identification and programming of real estate actions and encroachment partnering (EP) projects. The RCUZ program requires continual local monitoring to ensure that the RCUZ study continues to reflect the best information available on operations, noise, RCZs, and land-use compatibility.

Chapter 2

RCUZ Program Responsibilities

1. Headquarters, U.S. Marine Corps

a. On behalf of the Commandant of the Marine Corps (CMC), the Deputy Commandant, Installations & Logistics (DC, I&L) shall provide policy for the USMC RCUZ program and exercise program and management responsibility for the USMC RCUZ program through the Assistant Deputy Commandant, I&L (Facilities) (ADC I&L (LF))/COMMCICOM;

b. Commanding General, Training and Education Command (CG, TECOM) shall review and comment on RCUZ studies and waivers. If a specific RCUZ-recommended action would affect range operational capabilities and safety, CG, TECOM must approve inclusion of that action in the RCUZ.

c. Deputy Commandant, Aviation shall review and comment on RCUZ studies and waivers with an aviation component.

d. ADC, I&L (LF)/COMMCICOM shall:

(1) Serve as executive agent for the Marine Corps RCUZ program and policies. Coordinate uniform implementation of the RCUZ program and provide appropriate guidance and oversight.

(2) Review and approve all RCUZ studies, updates, and public release documents, including consideration of waiver requests for deviation from RCUZ standards and guidance in this instruction.

(3) Coordinate with DC, Aviation on RCUZ studies with an aviation component.

(4) Coordinate with CG, TECOM on all RCUZ matters that affect range operational capabilities and safety to include SDZs, WDZs, and LSDZs in RCUZ studies.

(5) MCICOM Assistant Chief of Staff (AC/S), Modernization and Development (G-7) shall:

(a) Serve as the lead for oversight of the RCUZ Program;

(b) Develop, coordinate, maintain, and update Marine Corps RCUZ policies and procedures to provide enterprise-wide direction for program planning, preparation, and execution;

(c) Provide command direction, priorities, and recommendations on RCUZ studies submitted by installation commanders and regions;

(d) Coordinate RCUZ program requirements with CG, TECOM, MCICOM G-3/5 RTA Management (RTAM), and MCICOM regions and installations;

(e) Promote an RCUZ education program in cooperation with CG, TECOM; and

(f) Fund, subject to availability, RCUZ study updates.

(6) MCICOM AC/S Facilities (G-F) shall ensure that RCUZ-related environmental and planning documentation requirements, including mitigation actions, are met in accordance with reference (e).

(7) MCICOM AC/S Operations/Plans (G-3/5) shall review and comment on RCUZ studies and waiver requests and approve RCUZ matters that affect RTA operational capabilities and safety.

e. Commander, Marine Corps Forces Command (COMMARFORCOM) and Marine Corps Forces Pacific (COMMARFORPAC) shall review and comment on RCUZ studies.

2. CGs, Marine Corps Installation Regions shall:

a. Exercise overall responsibility for coordinating Marine Corps RCUZ study development and implementation strategies within their respective region;

b. Actively work with state, regional, county, and city planning officials to implement RCUZ objectives;

c. Ensure that RCUZ issues affecting existing airspace are properly planned and processed through the Regional Airspace Coordinator (RAC).

d. Provide implementation guidance and concurrence with priorities and recommendations in RCUZ studies submitted by installations under their cognizance.

e. Provide guidance to ensure that RCUZ-related environmental documentation requirements are met and that environmental planning and resource management is in alignment with RCUZ compatibility recommendations to preserve military mission support.

3. Installation CGs and Commanding Officers shall implement the concepts set forth herein:

a. Actively work with state and local planning officials to implement RCUZ study recommendations.

b. Notify the chain of command whenever local command conditions merit reviewing or updating the RCUZ study.

c. Assign range management personnel to participate in the RCUZ program and coordinate matter pertaining to current and future operations in the RTA.

d. Attend and promote staff attendance at seminars sponsored by MCICOM to increase awareness of current trends and techniques related to RCUZ program matters.

e. Direct and actively work with the Community Planning and Liaison Officer (CPLO) to execute the RCUZ program and act as spokesperson for the command in RCUZ matters.

f. Maintain a documentary file on the implementation of the RCUZ study. Documentation should contain, among other things, a chronological narrative of important events, such as official implementation actions, newspaper articles, operational data and references, aerial and ground photographs, and pertinent correspondence.

g. Ensure that RCUZ-related environmental documentation requirements are met and that environmental planning and resource management is in alignment with RCUZ compatibility recommendations to ensure no net loss in the capability of installation lands to support the military training and operations.

4. Commanders, Mission Component Commands and Tenant Commands shall:

a. Review Training Exercise and Employment Plan (TEEP) resource (land, air, water, electromagnetic spectrum) training requirements with appropriate Region and Installation-level Commander and staffs on a recurrent basis, to identify changes in training tactics, platforms, or weapons requirements for specific ranges to inform ongoing RCUZ Program execution and enable determination of potential need to conduct an RCUZ technical review.

b. Review and comment on the potential training impacts of proposed RCUZ mitigation actions.

5. Community Planning and Liaison Officers (CPLOs) shall:

a. Execute the RCUZ program, serving as the Commander's staff representative.

b. Conduct RCUZ program monitoring and the technical review in coordination with range management personnel, appropriate subject matter experts, and tenant command representatives.

c. Coordinate RCUZ study development and installation-wide RCUZ implementation functions.

6. Range management personnel shall:

a. Implement RCUZ guidance and recommendations within RTA management responsibilities in accordance with reference (d). RCUZ land use compatibility recommendations are planning factors in the RTA and should be considered as appropriate.

b. Ensure ranges are certified in accordance with reference (b) while meeting RCUZ guidance and land use compatibility recommendations. This includes managing specular hazards to prevent diverting the laser from the intended target and identify all ground locations/personnel requiring personal protective equipment.

c. Actively engage with Tennant Commands to review TEEP resource training requirements (land, air, water, electromagnetic spectrum) on a recurrent basis to identify changes in training tactics, platforms, or weapons requirements for specific ranges to enable determination of potential RCZs.

d. Notify the installation CPLO when conditions change in the RTA that may trigger a review of the RCUZ study per Enclosure (2).

7. Installation Facilities and Environmental Staff (GF or Special Staff). Individuals responsible for master planning, facilities siting, environmental planning, and natural and cultural resource management staff shall ensure they clearly document compliance with RCZs or where compliance would

contravene appropriate law or regulation. Compliance shall be coordinated with CPLOs and range management staff and noted in all site approval and National Environmental Policy Act (NEPA) documentation.

Chapter 3

RCUZ Program Monitoring

1. General. Each installation must continually monitor operations and RTA requirements to determine if and when a Technical Review or RCUZ study update is required. RCUZ studies are intended to support long-term compatible land use in the vicinity of RTAs germane with the installation's encroachment management program and should be updated only when circumstances require such action. Frequent RCUZ study updates and changes in land-use recommendations can undermine the neighboring communities' confidence and willingness to incorporate recommendations into comprehensive plans or to enact various land-use controls. The following provides areas of consideration when determining whether a Technical Review and/or study update is required.

2. Airspace Considerations

a. The Federal Aviation Administration (FAA) is the single manager of the National Airspace System (NAS) to control the use of navigable airspace of the U.S., including regulation of civil and military operations within the NAS in the interest of safety and efficiency. A primary means of segregating military activities from non-participating aircraft is through the assignment of SUA to contain these activities. When making SUA determinations and assignments, the FAA takes into consideration the requirements of national defense, commercial and general aviation, and the public right of freedom of transit through navigable airspace. Thus, RCUZ studies must be cognizant of not only what is happening on the surface, but also what is taking place in the air over that surface when determining compatible land use areas.

b. To ensure sufficient range and airspace capability will be available to support existing and future mission requirements, an analysis of SUA and non-assigned whitespace within the NAS may need to be conducted for RTAs in accordance with references (f) and (i). The Department of the Navy (DON) codifies these analyses in its Naval Airspace Plan. The Naval Airspace Plan defines current and projected SUA requirements based on data from the DON Regional Airspace Plans (RAP). The RAP includes non-SUA issues that impact DON SUA assets, which may include radar, FAA flight plans, military training route (MTR) encroachment, and encroachment from wind farm proposal, etc. The DON's Naval Aviation Simulation Model (NASMOD) is one tool to use to determine range and airspace capacity and assess military airspace training requirements. Consider RAP and NASMOD findings and recommendations when developing or updating the RCUZ study.

3. RTA Considerations

a. The designation of WDZs/SDZs/LSDZs within the RTA is governed by reference (b). The Range Facility Management Support System (RFMSS) and the Data Collection and Scheduling Tool, respectively, support all major Marine Corps range management processes, including scheduling, range control, utilization, and inventory. The Range Managers Toolkit provides access to the WDZ, SDZ, and Laser Range Management Tool resources to help establish the RCUZ RCZs. Policies and procedures for RTA management are found in reference (d).

b. Consider new weapons systems, significant changes, natural resource use (e.g., recreation, management of vegetation, or listed species), or new operational activities within the RTAs when developing the RCUZ study or

determining whether an update is needed. New weapons systems or other governmental actions or changes in the RTA that may signal a need to update the RCUZ may also trigger NEPA requirements.

4. NEPA Considerations

a. Potential changes in operational procedures, weapons systems, or RTA activities may constitute a major federal action requiring NEPA compliance actions. In the event such an action or change triggers NEPA documentation, evaluate current RCZs and noise contours and update the RCUZ study as appropriate. This is accomplished through the Technical Review led by the CPLO as outlined in Chapter 4. Any existing noise analysis, if it is the most recently completed noise study, may be used for the comparative baseline for an RCUZ technical review and update.

b. Independent updates to the RCUZ study or noise contours do not by themselves trigger the NEPA process, but it is important that the Technical Review is conducted in concert with environmental planners in the event the RCUZ review identifies actions requiring possible NEPA analysis.

5. Land Use Compatibility Monitoring

a. The importance of having sensitivity to long-range encroachment indicators, including development far outside the RCUZ footprint that can limit future mission changes or expansion, cannot be overemphasized. Land use and development, both on-base and surrounding the installation, shall be continuously monitored for existing or future incompatibilities with RTA operations and RCUZ land use recommendations. Government policy and planning documents at all levels will be monitored for changes or modifications that could influence future land use patterns or otherwise affect RTA operations or RCUZ implementation. Such documents include, but are not limited to, local capital improvement plans, comprehensive land-use plans, or installation natural resource management plans. Land use compatibility monitoring is implemented through the Encroachment Management Programs as detailed in reference (c). MCI or Region ECPs are the primary planning document for analyzing encroachment concerns and providing recommendations and strategies for preventing, mitigating, or repairing impacts within the military mission footprint, including community engagement and implementation of compatibility recommendations. ECPs consider and incorporate Air Installations Compatible Use Zones (AICUZ) and RCUZ studies.

b. A key aspect of an Encroachment Management Program is continuous stakeholder engagement. The Installation Commander should convey to the local land use and planning agencies that the RTAs are a major land use in the local community and merit special consideration and protection. This includes presenting concerns with development beyond the RCZs and noise contours in appropriate local forums. CPLOs and RACs need to be cognizant of potential actions which may encroach upon the use of range training airspace, including developments subject to aeronautical studies from the FAA’s Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) program. Open communication and partnering with, when appropriate, local aviation interests is encouraged to facilitate current and projected future access to training airspace.

6. Other Studies and Programs

a. AICUZ. Air Stations should consider their AICUZ program for airfields with the RCUZ as part of a joint community engagement strategy and the land use compatibility planning efforts of their Encroachment Management Program in accordance with reference (c).

b. Range Complex Management Plans (RCMPs). RCMPs address long-term sustainable range use, management procedures, and record keeping to support current and future operations. RCMPs are key planning documents for RTAs and their ability to support Marine Corps Operational Forces. The RCMPs often incorporate final AICUZ and RCUZ studies.

c. Compatible Use Study. The Compatible Use Study (formerly known as the Joint Land Use Study) is a cooperative land planning effort between military installations and surrounding communities sponsored by the DoD Office of Economic Adjustment to promote community growth and development compatible with the training and operational mission of the military installation. This effort is led by the local community with financial grant assistance from the DoD Office of Economic Adjustment and cooperation from local installation personnel with a community implementation focus. The study uses AICUZ and RCUZ study findings and recommendations as technical inputs that are considered in the community compatible use plan in association with community comprehensive land use plan.

d. Installation Natural Resources Management Plans (INRMPs) and Installation Cultural Resource Management Plans (ICRMPs)

(1) INRMPs and ICRMPs can inform the need to conduct a Technical Review or update to the RCUZ, given that natural and cultural resources on or near RTAs can lead to environmental regulations and encumbrances on training and operations. CPLOs and range management staff must coordinate RCUZ efforts with installation natural and cultural resource management staff to bring awareness of their respective programs and seek solutions for compatible use of resources and no net loss to training.

(2) Changes in RCZs and noise contours may have implications for species impacts and resource management. Resource management staff will ensure the INRMP, ICRMP, and other resource management plans and actions consider and implement the RCUZ compatibility recommendations. Installations may also consider coordinating and aligning the planning cycles of planning documents such as INRMPs and master plans with RCUZ studies for consistency and informed planning across disciplines.

Chapter 4

Technical Review: Development of RCZs and Noise Contours

1. General. An RCUZ study serves as the tool for communicating RCZs, noise contours, and land use compatibility recommendations outlined in Appendices B and C. This Chapter provides more details on the RCUZ study analyses. When new or changed operations, RTA requirements, weapons systems or platforms, encroachment-related restrictions on and off-installation, or other circumstances require an update of the RCUZ study, the installation must conduct a Technical Review. The Technical Review includes review of noise generated by aircraft as well as air-to-ground (A-G), ground-to-air (G-A), and ground-to-ground (G-G) ordnance firing; the range safety analysis in accordance with reference (b) and subsequent development of the RCUZ footprint; and noise-reduction strategies for impacted lands, both on and off the installation. The development of the RCUZ footprint takes into account the underlying areas that are exposed to high levels of noise or accident potential, or both. The RCUZ footprint is then used to analyze land-use compatibility and develop recommendations. Compatible land-use analyses and recommendations should be based on the best available noise exposure contours and RCZs for the installation.

2. Analysis of Current and Future Operations. Future-year planning (normally 5-10 years forward) is necessary to consider the effects of projected changes in mission, aircraft, operational and training levels, etc. Therefore, in addition to the analysis of current operations, the Technical Review and ultimate RCUZ study will include an analysis of projected operations. Projections of aircraft and range operations will be based upon currently available unclassified estimates of future mission requirements, including new platforms and ordnance with an initial operational capability or future operational capability within the next 10 years that is projected to be employed at the range. Range plans and projections are also addressed in the installation and regional RCMPs. Inclusion of the long-range prospective operations should minimize the requirement to update the RCUZ study as often. Where little to no change is expected in the next 5-10 years, the CPLO may coordinate with mission component commands and seek approval by Marine Corps Installations Command (MCICOM Assistant Chief of Staff (AC/S) (G-7) to conduct the Technical Review and RCUZ update without consideration of projected future operations.

3. RCZ Development

a. General. RCZs translate live fire activities (direct and indirect) and ordnance delivery safety concerns into recommended compatible land use zones. RCZ size is not affected by the number of annual range operations, but is based upon the types of operations performed on the range. The operations should be outlined in current Standard Operating Procedures (SOP), range regulations, and the current range certification. RCZ land use recommendations are more stringent than those for noise impacts because the possible harmful consequences of allowing incompatible land uses and activities in proximity to an RCZ are more serious. For land use planning purposes, RCZs define areas based on a level of protection to public health, safety, and welfare and to recommend compatible land uses to prevent the potential degrading of operational range capability. RCZs are not predictors of safety hazards, but depict areas where there is an increased possibility of a mishap occurrence.

b. RCZ-I, RCZ-II, and RCZ-III will be developed where A-G and G-A ordnance delivery is involved.

c. At installations where no A-G or G-A ordnance delivery operations are conducted, the installation will develop an RCZ-I, but may not have an RCZ-II or RCZ-III.

d. Specific compatible land use area depictions and land use criteria recommendations exist for applicable aircraft operations when aircraft takeoff and landings are conducted leading to delivery of ordnance on the installation range(s). These include areas within aircraft lateral safety clearances and under imaginary surfaces, as well as accident potential zone(s) contained in references (j) and (k). These areas require land use compatibility designations and protection considerations that may or may not have been reflected in the airfield's associated AICUZ study, and should be reflected in the RCUZ study.

e. All RCZs must be reviewed and analyzed during the Technical Review and depicted as part of the RCUZ footprint in RCUZ study update publications. RCZs must be depicted on and off the installation, over land, and over water.

4. RCZ Guidelines

a. RCZ-I is a composite footprint of the SDZs, WDZs, and LSDZs developed in accordance with reference (b). RCZ-I defines the area of the greatest potential safety hazard and designates the minimum range surface area needed to contain all ordnance and lasers delivered at Marine Corps ranges. RCZ-I is the most restrictive of the three RCZs; there are no compatible land uses permitted within the RCZ-I (see Appendix A).

(1) SDZ and WDZ, as defined in reference (b), identify hazardous areas that result from the firing and/or delivery of weapons and ordnance. LSDZs depict where laser radiation levels may exceed maximum permissible exposure levels, thereby requiring control during laser operations.

(2) Reference (b) provides the minimum safety requirements for SDZs. Munitions will not be fired or employed on a range outside of SDZs that have been developed and maintained for the range.

(3) WDZs identify the minimum area necessary to contain munitions and hazardous fragments within the installation or range boundary that result from air-to-ground ordnance delivery operations. A WDZ encompasses the ground and airspace for lateral and vertical containment of projectiles, fragments, debris, and components resulting from the firing, launching, and/or detonation of aviation-delivered ordnance. Marine Corps standards for this range safety are detailed in reference (b).

(4) Laser use and the associated LSDZ will be determined through the laser certification process. Per reference (b), LSDZs must be contained within the certified laser range area and never extend off range.

(5) If specific situations require the permanent establishment of the RCZ-I outside the range boundary, efforts to either acquire the necessary property or negotiate a use agreement with the owner or agent controlling the land should be made in accordance with reference (l) and forwarded for approval. Operations may not commence until the land has either been acquired or use agreements put in place.

b. RCZ-II defines the area of aircraft armed over-flight. RCZ-II is less restrictive than RCZ-I but still poses a level of potential safety concern and comes with compatible land use recommendations. For the purposes of this order, the period of armed over-flight is defined as beginning when an aircraft with ordnance places the cockpit arming switch in the "ARMED" position. The point at which this is authorized is set forth in the range safety policies in reference (b) and installation range Standard Operating Procedures (SOP). For scored targets, the corridor width is normally 1000 feet, centered on the run-in centerline to the target, extending to the edge of RCZ-I. For tactical targets, the length of the zone also begins at the arming point. However, additional analysis is required to determine the width of the corridor dependent on specific local requirements and electronic warfare threats that may exist, and of the ordnance being expended. The width of the corridor should extend an additional 500 feet beyond all possible flight tracks associated with the target. Installation Commanders may alternately, at their discretion, identify RCZ-II as that area where ordnance would impact if released inadvertently following activation of the arming switch. If this method is utilized, RCZ-II must be completely contained with the range boundary.

c. RCZ-III includes all portions of designated SUA, such as Restricted Airspace and Military Operations Areas, associated with the RTA outside RCZ-I and RCZ-II. RCZ-III identifies the minimum level of safety concern and recognizes airspace that is restricted for safety of flight. Areas within RCZ-III generally provide access to and from the target, allow for safely separating participating and non-participating aircraft, and provide the range user with tactical maneuvering room for initial alignment for target acquisition. While RCZ-III correlates to airspace, it is the land use underlying the airspace that is considered for compatible land use recommendations within the range complex.

5. Development of Noise Contours

a. Noise exposure analysis prepared under the RCUZ technical review are for internal planning purposes. The noise exposure analysis consists of collecting data, modeling, and depicting noise contours. The noise exposure analysis defines the operational noise contours required for the RCUZ study. The noise contours reflect human thresholds, but potential species thresholds may also fall within the human thresholds, presenting implications for installation land use and natural resource management. Noise studies prepared under NEPA can be used in the technical review process to assess the need for an RCUZ update. Noise studies can provide useful information that does not always result in the need to update the RCUZ study. Installation requests for RCUZ noise studies, validated by the appropriate MCICOM Region, are forwarded to MCICOM AC/S (G-7), as applicable, for funding consideration.

b. Upon completion of the noise study, the CPLO and Range Control Officer will review the results and provide a recommendation to the Installation Commander on incorporating the contours into a potential RCUZ update. The Installation Commander shall recommend the most appropriate noise contours for incorporation into the potential RCUZ public-release document for approval by the ADC I&L (LF)/COMMCICOM.

6. Noise Modeling. Part of the RCUZ study includes preparation of noise contours and a comparison to prior noise contours published in the last approved RCUZ or relevant NEPA document. The noise contours are developed by

a computerized simulation of aircraft and ordnance activity at the range and reflect site-specific conditions (e.g. terrain) and operational data; e.g., flight tracks, type and mix of aircraft, aircraft profiles (airspeed, altitude, power settings), and number/types of munitions employed as well as the frequency and times of operations. When modeling aircraft noise, blast noise from A-G, G-A, large caliber G-G fire, noise from small-arms fire, and noise from supersonic operations where applicable, and resultant noise contours, use the following metrics and modeling methods:

a. Day-Night Average Sound Level (DNL). This noise descriptor will be used to describe the noise environment and predict community annoyance from exposure to aircraft and ordnance operations. DNL incorporates a 10 decibel (dB) penalty for noise exposure between the hours of 2200-0700, due to reduced background noise and increased sensitivity at nighttime.

(1) A-Weighted DNL (ADNL) will be used to describe the aviation noise environment.

(2) C-Weighted DNL (CDNL) will be used to describe the blast noise environment for ground training ranges involving the live fire of large caliber (greater than 20 mm) munitions and detonation of explosives.

(3) Installations in California will use the Community Noise Equivalent Level (CNEL) descriptor. CNEL incorporates a 5 dB adjustment for sound measured between 1900-2200, in addition to the 10 dB penalty between 2200-0700. If state or local laws require some other noise descriptor, it may be used in addition to DNL and CNEL.

(4) Unweighted peak decibel (dBP) levels will be used to describe the noise environment for ground training ranges involving the live fire of small caliber (.50 caliber and smaller) munitions and as additional supplemental information for large caliber munitions and other implosive sounds.

b. DoD Noise Models. The Marine Corps will use the latest DoD-approved noise models and scientifically validated noise descriptors (metrics) as the primary means of analyzing military noise, noise impacts, and compatible land use.

(1) NOISEMAP and Rotorcraft Noise Model. This suite of computer-based modeling programs is used for developing noise contours for fixed-wing aircraft and the Rotorcraft-Noise Model (RNM) program is used for developing noise contours for rotary-wing and tilt-rotor aircraft operations. The NOISEMAP program is used for ranges with a fixed run-in heading. The Range Noise Map program (MR_NMAP) is used for ranges with variable run-in headings and for low-level MTRs to and from the range. Pending DoD approval, Advanced Acoustic Model (AAM) will replace NOISEMAP and RNM.

(2) BNoise is used for modeling heavy weapons and noise from ordnance delivery (anything 20 mm and greater, such as blast noise and explosives).

(3) SARNAM is used for modeling small arms noise (.50 caliber and below).

c. The RCUZ study must document the selection criteria and rationale for the noise contours, the current year or prospective future use to reflect aircraft noise, as well as blast and small arms noise. The study must also

clearly describe the estimated frequency of the period of operations that was used in modeling the noise contour presented.

d. All technical reviews and noise analyses conducted using BNoise and SARNAM (including initial analysis input data), must be coordinated with the U.S. Army Public Health Center.

7. Noise Contour Guidelines

a. At a minimum, aircraft noise contours for ADNL of 60, 65, 70, 75, and 80 (where applicable) shall be plotted on separate maps for Marine Corps ranges as part of RCUZ studies. Contours below 60 ADNL/CNEL for aircraft are not required, but may be provided if local conditions warrant discussion of lower aircraft noise levels. Blast noise contours in CDNL of 57, 62, and 70 CDNL shall be included, along with a supplemental analysis using peak noise values and distances for representative events. For small arms ranges, noise contours shall include the areas exposed to unweighted peak noise values <87 dB; 87 dB to 104 dB, and >104 dB. For large caliber weapons and impulsive sound, supplemental information noise contours will reflect the dBP value <115dB; 115-130 dB; and ≥130 dB. Single event peak noise levels are not measured or used for aircraft noise.

(1) For land use planning purposes, areas where the noise exposure is less than 65 ADNL for aviation noise or 62 CDNL for blast noise are the areas of lowest noise exposure. This is an area where most individuals can adapt to the noise. However, noise may be heard in this area. Thus, some degree of land use control or disclosure notification is recommended (e.g., for areas under ingress and egress routes to and from training ranges or areas where single event peak blast noise of 115 dBP is expected to be exceeded by 15 percent of all events that might occur (represented by the metric PK15(met)). Recommended land use compatibility for noise contours are provided in Appendix B.

(2) Areas located between the 65-69 and 70-74 ADNL contours for aviation noise or in the 62-70 CDNL contour for blast noise are subject to moderate noise exposure. Compatible land use recommendations are made for both on-base and off-base locations.

(3) Areas subject to noise exposure equal to or greater than 75 ADNL for aviation noise or equal to or greater than 70 CDNL for blast noise are in the areas of highest noise impact. The compatible land use recommendations for both on-base and off-base locations are most restrictive in these areas.

b. Even though noise contours below ADNL of 65 and CDNL of 62 may imply limited noise impact, individuals living near a range or air station in such areas can become annoyed and some may complain. Supplemental metrics can be useful in explaining potential impacts in these areas. For example, Onset-Rate adjusted DNL (DNLmr or CNELmr) is often used to model aircraft flying along MTRs and in SUA to adjust the sound exposure level of the aircraft upward in the modeling to account for the "surprise" effect of the sudden onset of aircraft noise events on humans in areas that only experience sporadic occurrences of aircraft. These methods can be useful to illustrate the cumulative effect of noise events when there is a large degree of variance among the noise sources. Issuing advance public notice of periods of increased operational activity, and the length of time the increased level will last, for example, can also be helpful in fostering public awareness and understanding of the importance and need for the increased level of activity

that is associated with the event. However, care must be taken to explain or avoid presenting a worst case depiction of noise without a clear explanation of how often the time periods that were used in the modeling reflected in the resulting noise contours are expected to occur.

c. The inclusion of time periods (acoustic day or acoustic night) in the computation of the DNL/CNEL (either A- or C-weighted) reflects their basic 24-hour definition. It can, however, be derived from operations over periods of multiple days. For application to military installations where operations are routinely conducted day-to-day, these metrics are usually applied as an Average Annual Day (AAD), where the total range operations are divided by 365 days to calculate ADNL and by 250 days to calculate CDNL for blast noise. All noise contours should be developed based on AAD operations. Use of another metric requires justification and approval by the MCICOM AC/S (G-7).

8. Alternative Noise Analysis. Each Technical Review must include an analysis and evaluation of operational alternatives for noise reduction when high noise contours extend outside the range boundary. This analysis describes changes to operations that have been implemented since the previous RCUZ study or could be implemented to manage or minimize noise impact on the installation and the nearby community. The alternatives analysis should consider altering flight tracks, run-ins, target placement, operational parameters (altitude, dive angle, airspeed), without compromising flight safety or mission requirements in order to examine impacts of high noise. Proposed changes to operational procedures require documentation by the local command as to the reasons for the change. Environmental documentation in compliance with NEPA may be required.

9. Land Use Information and General Guidance

a. Compatible land use information and general guidance, listed by land use category, is presented in Appendices B and C for use on-base and by local governments in their land use planning and zoning deliberations. Land-use compatibility guidelines for RCZs are founded on the concept of minimizing density of land use in the vicinity of RTAs. In addition to minimizing density, the RCZ compatibility guidelines also recommend minimizing intensity of certain land uses that support high concentrations of people. Where local authorities have adopted specific land use recommendations for RCZs and noise contours that are more stringent than the criteria herein provided, the RCUZ study may incorporate and support the specific local criteria. However, land use planning recommendations proposed for publication in RCUZ documents that vary from Appendices B or C require ADC I&L (LF)/COMMCICOM approval prior to public dissemination.

b. Where a specific local land use is not adequately described in the standard guidance document, refinement and interpretation of the basic data is encouraged, within the constraints of accepted land use planning practice. Land use recommendations for specific local land uses not described by the guidance must be approved by MCICOM G-7.

Chapter 5

RCUZ Study Requirements and Public Release

1. Approvals. Revisions or updates to the RCUZ footprint and public distribution of RCUZ information requires COMMCICOM approval.

2. General

a. RCUZ program objectives are met, in part, by publication of an RCUZ study. RCUZ studies, intended for public use, serve as a tool to communicate RCUZ program objectives and noise contours, RCZs, and land-use compatibility analysis with neighboring communities. As such, RCUZ studies should be as brief as possible, with clear and concise writing that can be understood by a member of the general public.

b. The public-release document must provide comparative analysis and figure overlays of the previous RCUZ study's noise contours with the updated noise contours. The comparison helps to identify changes to noise exposure based on current and projected changes in air and ground operations, and allows for targeted identification of incompatible land uses and activities.

c. Internal study. Several aspects of the RCUZ study effort are for internal planning or deliberative purposes only and are not intended for public release. These components, discussed in further detail elsewhere in this order, include:

(1) A discussion of the decision to implement or not implement alternatives outlined will be included with supporting rationale.

(2) On-base implementation activities, except for resource management activities that would be shared with appropriate regulatory agencies.

(3) On-base incompatible land uses.

(4) The internal technical assessment (outlined in Chapter 4) of operational data and range safety standards.

(5) Noise exposure analysis prepared under the RCUZ technical review, as opposed to noise contours presented in the final study document.

3. RCUZ Study Requirements. MCI ranges listed in Chapter 8 must include the RCUZ study sections and content described below and outlined in Appendix D. For other MCIs that have smaller range complexes, the content outlined below can be limited to be more descriptive of the location and range(s) involved.

a. Executive Summary. This provides a concise summary of the findings, conclusions, and recommendations of the RCUZ study. This section will also include a brief discussion of any extenuating or mitigating requirements necessary for safe range operations.

b. Introduction. This section includes a discussion of the RCUZ program and provides the plan user with a familiarity of the operational aspects of the range. In particular, information relating to the RCUZ program will include a general description of the purpose, scope, authority, objectives, program history, and roles and responsibilities for implementing the RCUZ Program. Range specific information will include the mission that this range

fulfills and how its role supports Marine Air-Ground Task Force, Naval, or Joint Service weapons delivery training or testing; a description of existing NEPA documentation, if applicable; a list of any assumptions that were utilized; and changes in operations, aircraft, or weapons that have necessitated an update when appropriate.

c. Range and Airspace Overview and RTA Footprint.

(1) This section includes a discussion and appropriate figures to depict the RTA. This includes the location of the range and associated SUA and MTRs; features such as impact areas, shooting ranges, and targets; the SDZs/WDZs/LSDZs; and restrictions and other local features that may affect range utilization, such as waterways or listed species, danger areas outlined in 33 Code of Federal Regulations part 334, nearby airfields, towers, or other man-made or natural features that may be of concern. This section should also include a discussion of uses that may cause the following:

(a) Smoke, dust, steam, or glint/glare that could obscure pilot and range safety personnel vision;

(b) Direct and indirect lighting that could interfere with pilot vision or use of night vision devices;

(c) Electromagnetic interference (EMI) with aircraft navigation, radars, communication systems, or weapons systems;

(d) Bird or wildlife hazards, such as landfills, wastewater treatment facilities, dredge spoil disposal sites, seafood processing plants, etc.; and

(e) Obstructions to low-level training capability, such as wind energy turbines.

(2) A description of other pertinent information that may add value to the overall analysis and land planning should also be included. This may include information relating to locations of past aircraft mishaps, locations of off-site ordnance drops, history of the area (especially if range boundaries have changed over time), use of lasers and safety considerations that they introduce, etc. Airspace matters shall be coordinated through the appropriate RAC in accordance with reference (f).

d. Exercises, Range, and Airspace Operations. This section includes a description of major exercises supported on the range, test and evaluation events, live fire operations, types and numbers of annual airspace utilization, current operations for each of the ranges involved (small arms, large caliber, explosives, amphibious, maneuver, unmanned aircraft systems, rotary-wing, tilt-rotor, and fixed wing operations) users of the range, normal days and times of operations, range utilization, avoidance areas, etc. A description of projected future operations and training and testing requirements, to include natural infrastructure, will be included in this section and analyzed in the subsequent RCZ and Noise Sections.

e. RCUZ Footprint. This section introduces the RCZs and noise contours and how they are developed. It should include:

(1) A description and illustration of the RCUZ footprint, including a map of the RCZs and noise contours and a comparison of the updated footprint

with the previously approved RCUZ footprint, if applicable. The RCUZ footprint provides the basis for land-use recommendations to encourage compatible development and to assure future mission sustainability at the installation.

(2) A comparison of the new RCZs to the previously approved RCZs or WDZs/SDZs/LSDZs. Include a description and graphical illustration of the notable differences and discussion of causal factors that contributed to the change (e.g., aircraft, tempo of operation, operational procedures). These changes could influence the decision to implement land-use control changes.

(3) A general description of the methodology used to develop noise contours and provide the aircraft, small arms, and impulse (blast) noise contours as appropriate. Include a comparison of the new noise contours to the previously approved noise contours, with a description and graphical illustration of the notable differences and discussion of causal factors that contributed to the change (e.g., aircraft, tempo of operations). Discuss alternatives considered to minimize off-site noise impacts if appropriate. Provide a discussion of noise complaints or inquiries associated with range operations.

(4) The RCUZ study should include an alternatives noise analysis when the noise contours equal to or greater than 75 ADNL/70 CDNL extend outside the range boundary, or where local conditions are likely to result in significant community annoyance to modeled noise exposure. A discussion of the decision to implement or not implement alternatives outlined will be included with supporting rationale. As this is internal deliberative planning information, it shall not be included in the public release document.

f. Land Use Compatibility. RCUZ studies shall include an analysis and graphic depiction of surrounding community zoning and existing and potential future land-use incompatibilities within and adjacent to the RCUZ footprint. Land-use compatibility guidelines for noise contours and RCZs, as included in Appendices B and C, must be included and used to assess compatibility of land use in the RCUZ footprint. The compatible land-use analysis must also include a description of land-use controls currently in effect in the area surrounding the installation. This section should also discuss the conclusions or recommendations from any existing planning studies (including NEPA noise studies, INRMPs, installation master plans, etc.), development plans, comprehensive plans, or any similar types of studies or plans that may be applicable.

g. RCUZ Recommendations. This section contains conclusions and recommendations for compatible land use controls or other planning options to implement the RCUZ compatible land use recommendations and address future development within and adjacent to the RCUZ footprint. This information should be shared with installation environmental, planning, and resource management staff and provided to government agencies with the recommendation that it be incorporated into the planning and regulatory processes. Provide clear explanation of the RCUZ study program objectives, noise contours, RCZs, and land-use compatibility analysis when sharing RCUZ recommendations. Examples of recommendations include specific community implementation strategies and zoning, sound-attenuated facility construction, and EP projects. Discussion of potential land acquisitions in the public release document should be limited to a general discussion and should not identify

specific parcels or landowners more appropriate for internal planning purposes.

j. Appendices should include any pertinent or supporting information; existing land use agreements; or other local land use control information that does not fit into the body of the plan and adds valuable information to users.

4. RCUZ Study Review and Approval

a. Once the RCUZ Study, or its update is prepared, the installation must submit the document to COMMCICOM for approval via the chain-of-command, with copy to: CG, TECOM, the Deputy Commandant for Aviation (for studies with an aviation component), and the appropriate Commander, Marine Corps Forces.

b. Information developed such as noise contours, RCZ footprints, or RCUZ recommendations shall be marked "Draft" and "Not for Public Release" and shall not be shared with individuals or other agencies, including state and local government agencies, officials, or planning offices until COMMCICOM formally approves the RCUZ study.

c. Once approved, MCICOM G-7 will transmit ADC I&L (LF)/COMMCICOM's letter of approval of the RCUZ to the installation. The signed letter of approval shall be inserted in the front of the RCUZ study prior to final printing, dissemination, and implementation.

5. RCUZ Study Distribution. After approval, a copy of the RCUZ study should be distributed to appropriate federal, state, and local agencies for information purposes by the installation. The installation shall retain electronic files including the Word document, an Adobe PDF version, supporting noise studies, and installation geospatial information and services (IGIS) geo-referenced data that is formatted to meet IGIS digital spatial and Geospatial Standards as outlined in reference (n). The RCZs and noise contours along with land use data layers will be incorporated into installation and/or enterprise-wide IGIS systems.

Chapter 6

RCUZ Implementation

1. General

a. Installations must actively and continuously implement the RCUZ program. The Installation Commander's involvement and support for the CPLO and staff personnel responsible for achieving compatible land use is critical to the program's success. The CPLO has the lead for these implementation efforts and is assisted by the entire staff. Program implementation may include: soliciting the cooperation of other government agencies to enact land-use controls, assessing operational modifications, coordinating a noise inquiry/community hotline for residents of surrounding communities, and acquiring land or interests therein to protect the range while maintaining public safety. An important component of this implementation is the continual monitoring of nearby land-use planning (e.g., rezoning applications, comprehensive or general plan updates, capital improvement plan updates). Proactive program implementation can result in early recognition of incompatibilities, thereby increasing opportunities to resolve them and can reduce future implementation requirements.

b. Installation Commanders must integrate the final RCUZ analysis into the ECP, RCMP, installation facilities Master Plan, INRMP, ICRMP, and the RAP.

c. MCIs listed in Chapter 8 currently have a RAICUZ/RCUZ document. The documents remain in effect until an update is required based on local determination.

d. As part of the broader, ongoing encroachment management program requirements of reference (c), the installation should support RCUZ implementation efforts by regularly informing local, state, and federal government agencies, tribes, citizens groups, and the general public on Marine Corps training and testing, range operations, and the requirements of the military RTA; the efforts underway and planned to reduce potential off-range weapons impacts and noise where practicable; and the recommendations listed in Appendices B and C on specific land use issues.

2. Implementing RCUZ Compatible Land-Use Recommendations

a. RCUZ policy is predicated on sharing information and promoting compatibility between range installations, neighboring communities, and other stakeholders responsible for land management near Marine Corps RTAs. This policy recognizes the local governments' responsibility to protect public health, safety, and welfare through controls like zoning ordinances, building codes, subdivision regulations, building permits, and disclosure statements. Local government implementation of RCUZ land use recommendations, through their local land use planning and zoning processes, is discretionary on their part. However, such implementation encourages compatible development in areas within and surrounding established RCZs and noise contours. Successful implementation of the RCUZ program depends upon a close working relationship between the installation and local community.

(1) Land-use planning and resource management must address long-range strategies involving present and future land use and development. Application of land-use control strategies often does not result in immediate

changes in land use in the areas subject to the specific requirements or restrictions. Additionally, since land-use planning is a long-range process, communities cannot be expected to change their comprehensive plans continually to reflect frequent changes in noise contours and RCZs. Frequent changes can undermine support for the program and could be counterproductive to the goal of community support for the RCUZ program. Hence, it is imperative that RCUZ studies consider not only current, but also realistic future range operation projections when making land use planning recommendations.

(2) Government agencies could choose to provide additional land-use controls outside of the RCUZ footprint based on economic and social concerns. Such actions by government agencies should be encouraged since they can have the effect of implementing long-term land-use compatibility.

b. In all cases, the RCUZ land use recommendations must consider the allowed aircraft operating altitudes in the corresponding airspace and preclude uses or height of natural or manmade objects that would pose a safety hazard to aircraft operations. RCUZ analyses and land use recommendations are incorporated into the ECP, where other mitigation strategies and solutions are discussed in the context of the overall encroachment control efforts, such as in the Real Estate Acquisition Strategy.

3. RCUZ Implementation Off-Base

a. The key factor in RCUZ implementation is effectively working with stakeholders, making the most of opportunities for communication and actions to protect and enhance the RTAs for future training. Installation Commanders should be proactive and engage state and local officials to encourage compatible land-use planning and the adoption of regulatory land-use controls and policies that are consistent with RCUZ standards within their jurisdictions.

b. Installation representatives, primarily Commanding Officers and their CPLOs, must take every opportunity to meet and engage with local governments, particularly planning and zoning agencies, and inform and educate them about our installations and operating missions. Although the emphasis of the RCUZ implementation effort must be on areas within the RCUZ footprint, the installation can and should comment on land-use issues outside of the footprint that might impact it. Such issues include large-scale developments bordering the RCUZ footprint, transportation or infrastructure system developments that could make the RCUZ footprint more desirable for development, or tall structures, such as cell towers that could penetrate approach or departure or other imaginary surfaces. Marine Corps installations are major land uses in the local community. The Installation Commander should convey to the local land use agencies that the RTA is a major land use in the local community and merits special consideration and protection. Development which occurs near the RCZs and noise contours could prevent mission changes or expansion in the future.

c. CPLOs and RACs need to be cognizant of potential actions which may encroach upon the use of range training airspace. Open communication and partnering with, when appropriate, local land use permitting agencies and aviation interests is encouraged to facilitate current and projected future access to training airspace. This includes monitoring proposed developments

and energy projects in the FAA's OE/AAA program for compatibility and adherence to RCUZ recommendations.

d. Pursuit of an acquisition or withdrawal of land near the RTA may be appropriate if local, regional, or state initiatives to prevent incompatible development prove unsuccessful or where analysis indicates other alternatives are not practicable to prevent encroachment. The installation should, on a regular basis, inform local governments, state governments, tribes, other federal agencies, citizens groups, and the general public on: (a) the requirements of the military RTA; (b) range operations; (c) RCUZ program objectives; (d) the efforts underway and planned to reduce potential off-range weapons impacts and noise where practicable; and (e) the recommendations listed in Appendices B and C on specific land use issues.

e. Mandatory real estate disclosure to prospective buyers and lessees of residential properties within noise contours and RCZs is also recommended. This disclosure is encouraged in the noise contours greater than 65 ADNL (or 65 CNEL), 62 CDNL, peak noise levels greater than 87 dB for small arms, and RCZs. Disclosure should also be encouraged within the general vicinity of the RTAs and noise contours below 65 ADNL/62 CDNL (see Appendix B) where operations may result in public annoyance. Installations should make every attempt to work with governments to encourage enactment of such legislative initiatives at the State or local level, as appropriate.

4. RCUZ Implementation On-Base

a. Implementation of the RCUZ study or update is an important element in the overall RTA master planning and encroachment management. The study helps to ensure the range is sustainable and will continue meeting future training and testing requirements. RCUZ guidelines should be incorporated into on-base planning and resource management programs. On-base implementation activities are internal to the Marine Corps and not included in RCUZ study public-release documents, except for resource management activities that would be shared with appropriate regulatory agencies. On-base incompatible land uses should be noted in internal documentation. On-base development and activities, as described in installation master plans, resource management plans, or a specific Area Development Plan developed per references (r) and (s), should be consistent with the land-use standards for RCZs and noise contours, as defined in this Enclosure. The concept is to integrate operational and environmental information such that resource management activities within the RCUZ footprint are compatible and provide for conservation of public lands while allowing the military lands to continue to meet the needs of military operations.

b. For planned development, including renovations or the repurposing of existing facilities, deemed inconsistent or in conflict with the RCUZ land-use standards, then the installation Commanding Officer must submit an RCUZ Waiver Request to ADC I&L (LF)/COMMCICOM (via the G-7) for review and approval. While existing facilities, land uses, and activities within the RCUZ footprint do not require an RCUZ waiver, efforts should be made, where applicable, to reduce or manage noise impacts (i.e., via sound attenuation) or otherwise adapt mitigations for those activities to meet operational requirements and to encourage incompatible activities to be relocated outside the RCUZ footprint.

5. CPLO Roles for RCUZ Implementation

a. Consistent communication with the surrounding community is essential for military installations. This communication provides information, ensures that the community knows how best to reach the installation, if needed, and allows the installation to exist compatibly with its surrounding community. This effort should be led by the Installation Commanders, with inputs and assistance from the CPLO and Communication Strategy and Operations (COMMSTRAT). While the COMMSTRAT typically handles issues related to media relations, the CPLO's role is related directly to day-to-day communications with relevant government offices, real estate professionals, developers, homeowners associations, and private citizens who are engaging in the compatible development process. In communications related to the land development process, the importance of clear, consistent communication from the installation to the community should not be underestimated. Chapter 3, "RCUZ Program Monitoring," contains additional details about RCUZ program monitoring responsibilities, including those that are typically assigned to the G-7 and CPLO.

b. Records of important discussions, negotiations, testimony, etc., with and before local government officials, boards, etc., must be maintained by the CPLO. The CPLO will ensure that documentation is available to indicate all reasonable and prudent efforts were made to preclude incompatible land use through cooperation with local government officials and that all recourse to such actions has been exhausted. Monitoring should include on-station operational activities, operational alternatives to reduce noise exposure, Technical Review findings, decisions, or all of the above.

6. Land Acquisition. Land acquisition should be considered only in critical situations where governments are unwilling or unable to enact land-use controls to achieve land-use compatibility within the RCUZ footprint or where long-term land-use controls are considered to be tenuous. Community-oriented strategies should be discussed before considering acquisition. Interests in land are typically acquired through Military Construction (MILCON) funding or EP. See Chapter 7 for more details on this topic.

Chapter 7

Real Property Guidance

1. Acquisition Policy

a. When land-use regulations do not provide sufficient range protection and local communities are unwilling or unable to provide such regulations, the Marine Corps must consider the acquisition of necessary real property interests sufficient to achieve land-use compatibility within the RCUZ footprint. Where the mission of the installation is threatened, acquisition of fee title or restrictive use easements over the impacted lands in any noise contour or RCZ may be appropriate to maintain operational integrity. Reference (o) provides DON policy for acquisition of real property or interests in land.

b. When it is necessary for the DON to acquire an interest in land, a careful assessment must be made of the type of interest to be acquired either in the form of restricted use easements or fee simple acquisition. In deciding what interest to acquire, the following factors are examined: the minimum interest necessary to protect the DON; when the property is needed; available funds; type of acquisition (e.g., fee v. restrictive easements); and environmental considerations (e.g., contaminated property, potential partners, NEPA). Land acquisition for which Congressional authorization is generally required usually involves undeveloped land. In most cases the installation may consider one of three processes for acquisition:

(1) MILCON Funding. The installation must ensure chain-of-command support from the appropriate resource sponsor and then submit a land-acquisition request via its chain of command for inclusion on the MILCON Integrated Priority List. Reference (o) provides further guidance.

(2) Encroachment Partnering. The EP program, per references (c) and (p), enables the Marine Corps to leverage available funds to acquire interests in land (usually in the form of a restrictive use easement or conservation easement) to preserve areas of compatible land uses and natural habitats near the installation.

(3) Minor Land Acquisition. The Marine Corps may be able to acquire low-cost interests in land outside the EP and MILCON processes using available operations and maintenance or MILCON funding in accordance with reference (o).

c. Real property interests to be considered for acquisition include, but are not limited to:

(1) specific land use allowance or prohibitions;

(2) the provisions for making low and frequent over flights;

(3) high aircraft noise;

(4) prohibiting light emissions that interfere with pilot vision;

(5) prohibiting electromagnetic and radio frequency emissions that interfere with aircraft communication or navigation equipment;

(6) control of the height of buildings, structures, towers, trees or other obstructions that interfere with aircraft operations; and

(7) access by government representatives or prohibiting entry of non-authorized persons.

2. Real Property Utilization Survey Interface

a. Reference (n) calls for continual review of Federal real property holdings and performing surveys to determine the level of their use. Properties found to be excess to the requirements of the holding agency are reported for disposal. In the past, the RAICUZ/RCUZ footprint has provided protection to the RTA, but increased pressure to dispose of excess property can dilute that protection. To avoid the forced disposal of lands required to protect the installation from encroachment, installations should ensure that required lands or easements are fully justified. Where disposal is directed, the Services will retain those rights and interests that are required for the protection of the installation's future operational integrity. Once property rights are relinquished, they are not easily, if ever, regained. The dynamic nature of operational needs must be evaluated in encroachment protection decisions.

b. When disposal of non-DoD Federal property at or in the vicinity of an installation could impact the military mission, the Marine Corps offices exercising real property accountability for the installation should seek to have the disposal agency retain compatible land-use easements over the property to be disposed of for the benefit of the installation.

3. Guidelines for Acquisition, Retention, and Management of Real Estate Interests within an RCUZ. This Order must not be used as sole justification for either the acquisition or the retention of owned interests beyond that required to protect the government. References (c), (l), (o), and (p) assign responsibilities and provides policy for the acquisition, management, and disposal of DON real property and real property interests, including through EP. Management of lands acquired within the RCUZ footprint should be incorporated into installation master plans, RCMPs, ECPs, installation natural resource management plans, or other appropriate existing management plans or programs (including EP agreements).

4. Documentation of Local Efforts

a. To justify a request for acquisition of an interest in real property within the RCUZ footprint, local commands must demonstrate that reasonable and prudent efforts were made to preclude incompatible land use through cooperation with local and state government officials and other federal agencies as appropriate, and that recourse to such actions has been exhausted. Examples of such efforts includes discussions, negotiations, or testimony with and before local officials, boards, etc.

b. Documentation of routine inspections by the installation for compliance with the use provisions and to ensure compliance is a necessary part of on-going real property management of these lands.

Chapter 8

Marine Corps Installations Required to Have Comprehensive RCUZ Studies

MCAGCC TWENTYNINE PALMS, CA (R-2501)

MCB CAMP PENDLETON, CA (R-2503)

MCAS YUMA (PORTIONS OF THE BOB STUMP TRAINING RANGE COMPLEX)

CHOCOLATE MOUNTAINS AERIAL GUNNERY RANGE (R-2507N/S/E)

BARRY M. GOLDWATER RANGE (R-2301W)

MCMWTC BRIDGEPORT

MCB QUANTICO, VA (R-6608)

MCB CAMP LEJEUNE, NC (R-5303, R-5304, R-5306D, R-5306E)

MCAS CHERRY POINT, NC (R-5306A)

MCAS BEAUFORT, SC (TOWNSEND RANGE COMPLEX) (R-3007/Coastal MOA)

MCB HAWAII

Appendix A

Recommended Land Use Compatibility in RCZs

Table A-1 Land Use Compatibility in RCZs

LAND USE	RCZ I	RCZ II	RCZ III
RESIDENTIAL - SINGLE FAMILY, DUPLEX, MULTI-FAMILY, MOBILE HOMES	N	N	Y[2,3]
TRANSIENT LODGING	N	N	Y[2,3]
SCHOOL CLASSROOMS, LIBRARIES, PLACES OF WORSHIP	N	N	Y[2,3]
HOSPITALS	N	N	Y[2,3]
NURSING HOME	N	N	Y[2,3]
AUDITORIUMS, CONCERT HALLS	N	N	Y[2,3]
OFFICE BUILDINGS - PERSONAL, BUSINESS, PROFESSIONAL	N	N	Y[2]
COMMERCIAL, RETAIL	N	N	Y[2]
MANUFACTURING	N	N	Y[2]
UTILITIES	N	N	Y[6]
PLAYGROUNDS, NEIGHBORHOOD PARKS	N	N	Y[2]
GOLF COURSES, RIDING STABLES, WATER RECREATION, CEMETERIES	N	Y[2,4]	Y[2]
OUTDOOR SPECTATOR SPORTS	N	N	Y[2]
INDUSTRIAL, WAREHOUSE, SUPPLIES	N	N	Y
LIVESTOCK, FARMING, ANIMAL BREEDING	N	Y[1,2]	Y[2]
AGRICULTURAL (EXCEPT LIVESTOCK), FORESTRY, MINING, FISHING	N	Y[1,5]	Y[5]
RECREATIONAL, PARKS, WILDERNESS AREAS	N	Y[2,5]	Y[2,5]

NOTES:

1. RCZ-II is an area of armed overflight. Land uses which have the potential to attract congregations of people are not compatible. For scored targets, no development within 500 feet either side of the run-in line centerline. For tactical targets, further analysis is required. Factors to be considered: labor intensity, structural coverage, aircraft type/frequency/ordnance load, altitude (weapons dispersion).

2. Incompatible when the training mission requires low altitude overflight (less than 500 ft.).

3. Suggested maximum density in RCZ-III is no more than 1-2 dwelling units per acre.
4. Clubhouses, chapels, and other facilities where people congregate are not compatible in RCZ-II.

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

6. Energy infrastructure and tall towers, including wind turbines, geothermal facilities, communications towers, and utility lines of sufficient height may impact military operations within SUA. Each new development must be analyzed for compatibility issues on a case-by-case basis and must consider both the proposal and potentially affected mission. Structure height restrictions may be appropriate, as well as other considerations for EMI, glint/glare impacts, and structure lighting and marking.

Appendix B

Recommended Land Use Compatibility in Noise Contours

1. Recommended land use compatibility guidelines in noise contours are shown in tables B-1 through B-3. Table C-1 provides compatibility recommendations for aircraft noise, table B-2 for small arms, and table B-3 for artillery and explosives. The primary objective is to discourage noise-sensitive land uses in areas of higher noise exposure. These land use compatibility recommendations are intended to support land use planning on- and off-installation. They do not constitute a federal determination of whether a use of land is acceptable under local zoning.

2. The tables are organized based on Standard Land Use Coding Manual (SLCUM) categories. However, the categories vary from SLUCM as the coding system does not differentiate based on noise-sensitivity. Some uses warrant additional evaluation due to potential for annoyance and activity interference. General notes and specific footnotes at the bottom of the table provide additional information and considerations for compatibility determinations. Additions to some land use categories have been incorporated into the table subsequent to issuance of the SLUCM, published in 1977, to reflect additional land uses and to clarify the categorization of certain uses.

3. Compatibility designations in tables B-1 through B-3 generally refer to the principal use of the site. If other uses with greater sensitivity to noise are proposed, or a site has mixed uses, the compatibility recommendations should be based on the use that is most adversely affected by noise and has the most restrictive recommendations.

4. When appropriate, noise level reduction (NLR) may be necessary to achieve compatibility. NLR (outdoor to indoor) is achieved through the incorporation of sound attenuation into the design and construction of a structure. Measures to achieve an indoor noise reduction do not necessarily solve noise issues outside the structure and additional evaluation may be warranted. Normal permanent construction can be expected to provide an NLR of 20 dB, thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded sound transmission class ratings in windows and doors, and closed windows year round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations. Measures that reduce noise at a site should be used wherever practical in preference to measures that only protect interior spaces. Note that NLR does not address low frequency vibration from blast noise and is not considered in Table B-3, Land Use Compatibility for Artillery and Explosives Noise.

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

6. Land use that involves outdoor activities in areas above 80db DNL are not recommended, but if the community allows such activities, hearing protection devices should be worn when noise sources are present. Long-term exposure (multiple hours per day over many years) to high noise levels can cause hearing loss in some unprotected individuals.

Table B-1 Land Use Compatibility in Aircraft Noise Contours

Land Use	Suggested Land Use Compatibility in A-weighted DNL/CNEL Levels					
LAND USE NAME AND SLUCM CATEGORY	60-64 dB	65-69 dB	70-74 dB	75-79 dB	80-84 dB	85+ dB
Residential Use Group – SLUCM Category 10						
Residential use, inclusive of all residential units, i.e., any type of single or multiple dwelling units	Y[1]	N[1]	N[1]	N	N	N
Mobile home parks or courts	Y[1]	N	N	N	N	N
Transient lodging	Y[1]	N[1]	N[1]	N[1]	N	N
Manufacturing Use Group – SLUCM Categories 20 & 30						
Manufacturing and Industrial (food and kindred products; textiles; apparel; lumber and wood products; printing; furniture and fixtures; chemical and allied products; petroleum industries; rubber and plastics, stone, glass, clay, and metal products)	Y	Y	Y[2]	Y[3]	Y[4]	N
Precision manufacturing (professional scientific and controlling instruments; photographic and optical goods; watches and clocks)	Y	Y	Y[2]	Y[3]	N	N
Transportation, Communication, and Utilities Use Group – SLUCM Category 40						
Rail, motor vehicle, aircraft, marine craft, and other transportation systems	Y	Y	Y[2]	Y[3]	Y[4]	N
Highway and street right-of-way; automobile parking	Y	Y	Y	Y	Y	N
Communications systems and utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Telephone, cellular, and radio communication	Y	Y	Y[2]	Y[3]	N	N
Trade Use Group – SLUCM Category 50						
Wholesale trade	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade – building materials, hardware, and farm equipment sales	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade – mass retailing, shopping centers, strip malls, discount clubs, home improvement stores, superstores, etc.; food and beverage establishments; automotive; apparel; home furnishings and equipment	Y	Y	Y[2]	Y[3]	N	N
Services Use Group – SLUCM Category 60						
Finance, insurance and real estate services; personal, professional, or miscellaneous services	Y	Y	Y[2]	Y[3]	N	N
Cemeteries	Y	Y	Y[2]	Y[3]	Y[4]	Y[5]
Warehousing and storage; repair services	Y	Y	Y[2]	Y[3]	Y[4]	N
Hospitals, medical facilities; child care and development	Y[1]	Y[2]	Y[3]	N	N	N

Land Use	Suggested Land Use Compatibility in A-weighted DNL/CNEL Levels					
LAND USE NAME AND SLUCM CATEGORY	60-64 dB	65-69 dB	70-74 dB	75-79 dB	80-84 dB	85+ dB
services; educational facilities						
Nursing homes	Y	N[1]	N[1]	N	N	N
Governmental	Y[1]	Y[1]	Y[2]	Y[3]	N	N
Cultural, Entertainment, and Recreational Use Group – SLUCM Category 70						
Cultural activities (including religious activities)	Y[1]	Y[2]	Y[3]	N	N	N
Nature exhibits	Y[1]	Y[1]	N	N	N	N
Public assembly	Y[1]	Y	N	N	N	N
Auditoriums, concert halls	Y	Y[2]	Y[3]	N	N	N
Outdoor music shells, amphitheaters	Y[1]	N	N	N	N	N
Outdoor sports arenas, spectator sports	Y	Y[6]	Y[6]	N	N	N
Amusements (including fairgrounds, miniature golf, driving ranges, amusement parks, etc.)	Y	Y	Y	N	N	N
Outdoor recreational activities	Y[1]	Y	Y[2]	Y[3]	N	N
Resorts, camps, parks, and other cultural, entertainment, and recreation	Y[1]	Y	Y[2]	N	N	N
Resource Production and Extraction Use Group[10] - SLUCM Category 80						
Agriculture and forestry	Y	Y[7]	Y[8]	Y[9]	Y[9]	Y[9]
Livestock farming, animal breeding	Y	Y[7]	Y[8]	N	N	N
Fishing activities	Y	Y	Y	Y	Y	Y
Mining and other resource production or extraction	Y	Y	Y	Y	Y	Y

KEY TO TABLE – LAND USE COMPATIBILITY IN NOISE CONTOURS

SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation

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

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

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

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

DNL – Day-Night Average Sound Level.

CNEL – Community Noise Equivalent Level (normally within a very small dB difference of DNL)

Ldn – Mathematical symbol for DNL.

NOTES FOR TABLE – LAND USE COMPATIBILITY IN NOISE CONTOURS

1. Although local demand for housing may support residential use in these zones, residential use is discouraged in DNL 65-59 and strongly discouraged in DNL 70-74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones. Where the community determines that these uses must

Land Use	Suggested Land Use Compatibility in A-weighted DNL/CNEL Levels					
LAND USE NAME AND SLUCM CATEGORY	60-64 dB	65-69 dB	70-74 dB	75-79 dB	80-84 dB	85+ dB
be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB in DNL 65-69 and 30 dB in DNL 70-74 should be incorporated into building codes and be considered in individual approvals. For transient housing, an NLR of at least 35 dB should be incorporated into DNL 75-79. Existing residential development is considered as preexisting, non-conforming land uses. 2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low. 3. Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low. 4. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low. 5. Buildings where the public is received are not permitted. 6. Land use is compatible provided special sound reinforcement systems are installed. 7. Where residences are permitted, measures to achieve outdoor-to-indoor NLR of at least 25 dB should be incorporated into the design. 8. Where residences are permitted, measures to achieve outdoor-to-indoor NLR of at least 30 dB should be incorporated into the design. 9. Residences are not compatible. 10. The land uses within this category include necessary associated resource management activities, for example, wildfire management activities for forestry.						

Source: Adapted from DoDI 4165.57

Table B-2 Land Use Compatibility for Small Arms Noise

Land Use	Suggested Land Use Compatibility	
LAND USE NAME AND SLUCM CATEGORY	87-104 dBP	>104 dBP
Residential Use Group – SLUCM Category 10		
Residential use, inclusive of all residential units, i.e., any type of single or multiple dwelling units	N[1]	N
Mobile home parks or courts	N	N
Transient lodging	N[1]	N
Manufacturing Use Group – SLUCM Categories 20 & 30		
Manufacturing and Industrial (food and kindred products; textiles; apparel; lumber and wood products; printing; furniture and fixtures; chemical and allied products; petroleum industries; rubber and plastics, stone, glass, clay, and metal products)	Y[2]	Y[3]
Precision manufacturing (professional scientific and	Y[2]	Y[3]

Land Use	Suggested Land Use Compatibility	
LAND USE NAME AND SLUCM CATEGORY	87-104 dBP	>104 dBP
controlling instruments; photographic and optical goods; watches and clocks)		
Transportation, Communication, and Utilities Use Group – SLUCM Category 40		
Rail, motor vehicle, aircraft, marine craft, and other transportation systems	Y[2]	Y[3]
Highway and street right-of-way; automobile parking	Y[2]	Y
Telephone, cellular, and radio communications; utilities	Y[2]	Y[3]
Trade Use Group – SLUCM Category 50		
Wholesale trade	Y[2]	Y[3]
Retail trade – building materials, hardware, and farm equipment	Y[2]	Y[3]
Retail trade – mass retail, shopping centers, discount clubs, home improvement stores, superstores, etc.; food and beverage establishments; automotive; apparel; home furnishings and equipment	Y[2]	Y[3]
Services Use Group – SLUCM Category 60		
Finance, insurance and real estate services; personal, professional, or miscellaneous services	Y[2]	Y[3]
Cemeteries	Y[2]	Y[3]
Warehousing and storage; repair services	Y[2]	Y[3]
Hospitals, medical facilities, nursing homes; child care and development services	N	N
Governmental	Y[2]	Y[3]
Educational services	Y[2]	N
Cultural, Entertainment, and Recreational Use Group – SLUCM Category 70		
Cultural activities (including religious activities)	Y[3]	N
Nature exhibits	N	N
Public assembly	N	N
Auditoriums, concert halls	Y[3]	N
Outdoor music shells, amphitheaters	N	N
Outdoor sports arenas, spectator sports	N	N
Amusements	Y	N
Outdoor recreational activities	N	N
Resorts, camps, parks, and other cultural, entertainment, and recreation	N	N
Resource Production and Extraction[6] Use Group – SLUCM Category 80		
Agriculture and forestry	Y[4]	Y[5]
Livestock farming and animal breeding	Y[4]	N
Fishing activities	Y	Y
Mining and other resource production or extraction	Y	Y

Key:

SLUCM – Standard Land Use Coding Manual

dBP - unweighted peak decibel level

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

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

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

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

Land Use	Suggested Land Use Compatibility	
LAND USE NAME AND SLUCM CATEGORY	87-104 dBP	>104 dBP

Notes:

1. Although local demand for on- or off-installation housing may support noise-sensitive land uses within the 87-104 dBP contour, such land use is generally not recommended. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these contours. Where the community determines that these uses must be allowed, measures to achieve outdoor to indoor NLR of at least 30 dB in the 87-104 dBP contour should be incorporated into building codes and be considered in individual approvals. Existing residential development is considered as pre-existing, non-conforming land uses.

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

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

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

5. Residences are not compatible.

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

Table B-3 Land Use Compatibility for Artillery and Explosives Noise

Land Use	Suggested Land Use Compatibility		
LAND USE NAME AND SLUCM CATEGORY	CDNL/CNEL 57-62	CDNL/CNEL 62-70	CDNL/CNEL 70+
Residential Use Group – SLUCM Category 10			
Residential use, inclusive of all residential units, i.e., any type of single or multiple dwelling units	Y[1]	N[2,3]	N[3]
Mobile home parks or courts	Y[1]	N[2,3]	N[3]
Transient lodging	Y	Y	N
Manufacturing Use Group – SLUCM Categories 20 & 30			
Manufacturing and Industrial (food and kindred products; textiles; apparel; lumber and wood products; printing; furniture and fixtures; chemical and allied products; petroleum industries; rubber and plastics, stone, glass, clay, and metal products)	Y	Y[4]	Y[4]
Precision manufacturing (professional scientific and controlling instruments; photographic and optical goods; watches and clocks	Y	N	N
Transportation, Communication, and Utilities Use Group – SLUCM Category 40			
Rail, motor vehicle, aircraft, marine craft, and other transportation systems	Y	Y	Y[4]

Land Use	Suggested Land Use Compatibility		
LAND USE NAME AND SLUCM CATEGORY	CDNL/CNEL 57-62	CDNL/CNEL 62-70	CDNL/CNEL 70+
Highway and street right-of-way; automobile parking	Y	Y	Y
Communications	Y	N	N
Utilities	Y	Y	Y[4]
Other transportation, communication, and utilities	Y	Y	N
Trade Use Group – SLUCM Category 50			
Wholesale trade	Y	Y	N
Retail trade – building materials, hardware, and farm equipment	Y	Y	N
Retail trade – mass retail, shopping centers, discount clubs, home improvement stores, superstores, etc., food and beverage establishments; automotive; apparel; home furnishings and equipment	Y	Y	N
Services Use Group – SLUCM Category 60			
Finance, insurance and real estate services; personal, professional, and miscellaneous services;	Y	Y	N
Cemeteries	Y	Y	Y
Warehousing and storage	Y	Y[4]	Y[4]
Repair services	Y	Y	N
Hospitals, medical facilities, nursing homes; child care and development services	Y[1]	N	N
Governmental	Y	Y	N
Educational services	Y	Y	N
Cultural, Entertainment, and Recreational Use Group – SLUCM Category 70			
Cultural activities (including religious activities)	Y[1]	N	N
Nature exhibits	Y[1]	N	N
Public assembly	Y[1]	N	N
Auditoriums, concert halls	Y[1]	N	N
Outdoor music shells, amphitheaters	Y[1]	N	N
Outdoor sports arenas, spectator sports	Y	N	N
Amusements	Y	Y	N
Outdoor recreational activities	Y	N	N
Resorts, camps, parks, and other cultural, entertainment, and recreation	Y	N	N
Resource Production and Extraction[5] Use Group – SLUCM Category 80			
Agriculture and forestry	Y	Y	Y
Livestock farming and animal breeding	Y	N	N
Fishing activities	Y	Y	Y
Mining and other resource production or extraction	Y	Y	Y

Key:

SLUCM – Standard Land Use Coding Manual

CDNL – C-weighted Day-Night Average Sound Level

CNEL – Community Noise Equivalent Level (normally within a very small decibel difference of DNL)

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

Land Use	Suggested Land Use Compatibility		
LAND USE NAME AND SLUCM CATEGORY	CDNL/CNEL 57-62	CDNL/CNEL 62-70	CDNL/CNEL 70+

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

Y^x – Yes with restrictions. The land use and related structures generally are compatible; however, see note(s) indicated by the superscript

N^x – No, with exceptions. The land use and related structures are generally incompatible; however, see note(s) indicated by the superscript

Notes:

1. The CDNL/CNEL 57-62 noise contour functions as a buffer for the CDNL/CNEL 62-70 contour. Communities and individuals often have different views regarding acceptable or desirable levels of noise. To address this, some local governments have implemented land use planning measures in areas below 62 dB CDNL. In addition to mitigating current noise impacts, implementing land use controls within the CDNL/CNEL 57-62 noise contour can create a buffer to prevent the possibility of future noise conflicts.

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

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

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

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

Appendix C

Noise Contours and Supplemental Metrics

1. Supplemental metrics, such as single event peak blast noise data (for example, PK15(met)), shall be employed where appropriate to provide additional information and notification on the effects of noise from heavy weapons on test and training ranges.

2. Disclosure statements should be recommended to inform renters and owners of housing of the risk of annoyance from large caliber impulsive noise resulting from testing and training activities, (e.g. armor, artillery, mortars, air-dropped live ordnance, and demolition activities). The areas for disclosure for noise associated with these activities should be assessed in terms of a single event metric, the unweighted peak sound pressure level (dBP). However, since the peak level can vary significantly based upon weather (can exceed 40 dB variation within a few hours), when using computer modeling for predicted peak levels, the area of disclosure should be based on the PK15(met) contour. The PK15(met) accounts for statistical variation in received single event peak noise level that is due to weather. It is the calculated peak noise level, without frequency weighting, expected to be exceeded by 15 percent of all events that might occur. If there are multiple weapon types fired from one location, or multiple firing locations, the single event level used shall include the loudest level that occurs at each receiver location and may include other representative events to present additional.

3. Noise from ordnance activity will be assessed in RCUZ Studies using the Army methodology.

4. Table C-1 summarizes noise contours for large caliber (impulsive) weapons, explosives, and small arms.

Table C-1 Army Weapons Noise Contours

Noise Contour(dB)	Noise Contour(dB)
Impulsive CDNL	Small Arms Peak (dBP)
<57	N/A
57-62	<87
62-70	87-104
>70	>104

5. Single event noise levels in Table C-2 correspond to areas of low to high risk of noise complaints from large caliber weapons and weapons systems. The levels in Table C-2 should be used to supplement the noise contours defined in Table C-1 and provide recommended disclosure areas for blast noise.

6. Peak sound pressure levels above 130 dB are generally objectionable, and are often described as very loud and startling. These levels correlate with a high risk of noise complaints. People in an area experiencing peak sound pressure levels between 115 and 130 dB may describe events as noticeable and distinct. From within this area, the installation has a moderate risk of receiving noise complaints. The magnitude of a complaint risk is dependent upon the frequency of occurrence, the time of day an activity occurs, propagation conditions, which may include weather conditions, topographical features and obstacles between the source and the receiver, under or at which

a noise-producing activity takes place, and the noise sensitivity of individuals in these areas.

7. Peak sound levels can vary significantly for the same operation (ver 40 dB) depending on existing weather conditions. Therefore, when using BNOISE to calculate and plot peak noise levels, the PK15(met) metric should be plotted. If multiple weapon types are fired from one location, or multiple firing locations, the single-event level used should be the loudest level that occurs at each receiver location.

8. For areas impacted by infrequent single noise events, such as a detonation of large amounts of explosives, the Installation Commander should determine if land use compatibility within these areas is necessary for mission protection. Advance notification of such events should be communicated to the public when practicable.

Table C-2 Risk of Noise Complaints by Level of Impulse Noise

Risk of Noise Complaints	Peak level (dBP)
Low	< 115
Medium	115 - 130
High	>130
Legend for Table C-2 **dB = decibel**	

Appendix D

Recommended Table of Contents for RCUZ Studies

Appendix E

Acronyms and Abbreviations

AAD	Average Annual Day
AAV	Amphibious Assault Vehicles
ACC	Area of Critical Concern
ADNL	A weighted day-night sound level (DNL)
AFA	Artillery Firing Area
A-G	Air to ground
AGL	Above Ground Level
AICUZ	Air Installations Compatible Use Zones
AIR	Air Inflatable Retard
ALUCP	Airport Land Use Compatibility Plan
APOBS	Anti-personnel obstacle breaching system
APZ	Accident Potential Zone
AT	Anti-tank
ATC	Air Traffic Control
BDU	Bomb Dummy Unit
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
BSU	Bomb Simulated Unit
BZ0	Battle Sight Zero
cal	Caliber
CAL	Confined Area Landing
CAS	Close Air Support
CBT	Combat Training Town
CDNL	C-weighted day-night average sound level
CFA	Controlled Firing Area
COMMSTRAT	Communication Strategy and Operations Officer
CNEL	Community Noise Equivalent Level
CPLO	Community Planning and Liaison Officer
CSO	Communications Strategy Officer
CY	Calendar year
CZ	Clear Zone
dB	Decibel
dBA	A-weighted decibels
dBC	C-weighted decibels
DNL	Day-night average sound level
DON	Department of the Navy
DZ	Drop Zone
ECP	Encroachment Control Plan
EFSS	Expeditionary Fire Support System
EMAT	Encroachment Management Action Team
EMI	Electromagnetic Interference
EP	Encroachment Partnering
EOD	Explosive Ordnance Disposal

FAA	Federal Aviation Administration
FAC	Forward Air Controller
FAC(A)	Forward Air Controller Airborne
FAR	Federal Aviation Regulation
FIREX	Firing exercises
FMF	Fleet Marine Forces
FOC	Full Operational Capability
FY	Fiscal Year
GEOFidelis	Common pseudonym given to the Marine Corps IGIS Program
G-A	Ground to air
G-G	Ground to ground
HE	High explosive
HEDP	High Explosive Dual Purpose
HIMARS	High Mobility Artillery Rocket System
HLZ	Helicopter Landing Zone
HOLF	Helicopter Outlying Landing Field
ICM	Improved Conventional Munitions
IFR	Instrument Flight Rules
IGIS	Installation Geospatial Information and Services
IOC	Initial Operational Capability
IP	Initial Point
JLUS	Joint Land Use Study
JSF	Joint Strike Fighter (F-35)
KIAS	Knots Indicated Air Speed
LAAD	Low Altitude Anti-aircraft Defense
LAV	Light Armored Vehicle
lb	Pound
LCAC	Landing Craft, Air Cushioned
Ldn	day-night average sound level
Ldnc	C-weighted day-night average sound level
LFAM	Live Fire and Maneuver
LHA	landing ship, helicopter assault
Lmax	Maximum sound level
Lpk	Peak Sound Pressure Level
LRMT	Laser Range Management Tool
LSDZ	Laser Surface Danger Zone
LW155	Lightweight 155mm howitzer
LZ	Landing Zone
MAGTF	Marine Air Ground Task Force
MAWTS-1	Marine Aviation Weapons and Tactics Squadron One
MCB	Marine Corps Base
MCAS	Marine Corps Air Station
MCI (Area)	Marine Corps Installations (Region)
MCICOM	Marine Corps Installations Command
MEB	Marine Expeditionary Brigade
MEF	Marine Expeditionary Forces

MG	machine gun
MICLICs	Mine Clearing Line Charges
MILCON	Military Construction
MK	Mark
MLRS	Multiple Launch Rocket System
mm	millimeter
MMG	Medium machine gun
MOA	Military Operations Area
MOU	Memorandum of Understanding
MOUT	Military Operations in Urban Terrain
MPF	Maritime Prepositioned Force
MPRC	Multi-purpose Range Complex
MSL	Mean sea level
MTR	Military Training Routes
NEW	Net Explosive Weight
NLR	Noise Level Reduction
NOHD	Nominal Occular Hazard Distance
NOTAM	Notice to Airmen
OE/AAA	Obstruction evaluation/airport airspace analysis
OP	Observation post
OTH	Over-the-horizon
PADS	Position Azimuth Determining System
PAO	Public Affairs Officer
PPE	Personal Protection Equipment
PK15(met)	Peak sound level, without frequency weighting and accounting for the statistical variation cause by weather, expected to be exceeded by 15 percent of all events that might occur.
RA	Restricted Areas
RAC	Regional Airspace Coordinator
RAICUZ	Range Air Installations Compatible Use Zone (replaced by the RCUZ program)
RCMP	Range Complex Management Plan
RCO	Range Control Officer
RCUZ	Range Compatible Use Zone
RCZ	Range Compatibility Zone
REPI	Readiness and Environmental Protection Integration
RFMSS	Range Facility Management Support System
RMTK	Range Managers Toolkit
RSOP	Reconnaissance, Selection, Occupation of Position
RTA	Ranges and Training Area
SDZ	Surface Danger Zone
SEL	Sound Exposure Level
SLUCM	Standard Land Use Coding Manual
SMAW	Shoulder-launched Multi-purpose Assault Weapons
SOP	Standard Operating Procedure
SOUM	Safety of Use Memorandum (interim safety guidance from TECOM for base, station, and operational commanders)
SRI	Sustainable Ranges Initiative
SROC	Senior Readiness Oversight Council

SUA	Special Use Airspace
TACP	Tactical Air Control Party
TECOM	Training and Education Command
TERF	Terrain (following) flight
TOW	Tube-launched, Optically-tracked, Wire-guided
TNT	Trinitrotoluene
TP	Training practice
TRACON	Terminal Radar Approach Control
UAS	Unmanned Aircraft Systems
UAV	Unmanned Aerial Vehicle
VFR	Visual Flight Rules
VIP	Very important person
V/STOL	Vertical/Short Take Off and Landing
WDZ	Weapons Danger Zone
WSFA	Weapons Safety Footprint Area *(Term in previously used SAFE-RANGE model replaced by WDZ)*