Powder River

Powder River Training Complex
Ellsworth Air Force Base, South Dakota
Environmental Impact Statement

Draft

August 2010

Appendices

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APPENDIX A
FAA PROCEDURES FOR PROCESSING AIRSPACE CHANGES

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U.S. Department
of Transportation

**Federal Aviation
Administration**

Order JO 7400.2G

Procedures for Handling Airspace Matters

April 10, 2008

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**Initiated By: AJR-0
Vice President, System Operations Services**

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Part 1. General Procedures for Airspace Management

Chapter 1. Basic

Section 1. Introduction

1–1–1. PURPOSE

a. This order prescribes policy, criteria, guidelines, and procedures applicable to the System Operations Services, System Operations Airspace and AIM; Technical Operations ATC Spectrum Engineering Services; the Office of Airport Planning and Programming, APP; the Office of Airport Safety and Standards, AAS; Technical Operations Aviation System Standards; and the Flight Standards Service, AFS.

b. This order also applies to all regional, service area, and field organizational elements involved in rulemaking and nonrulemaking actions associated with airspace allocation and utilization, obstruction evaluation, obstruction marking and lighting, airport airspace analysis, and the management of air navigation aids.

c. While this order provides procedures for handling airspace matters, additional procedures and criteria to supplement those contained herein may be set forth in other directives and should be consulted.

1–1–2. DISTRIBUTION

This order is distributed to select offices in Washingtonheadquarters; the Office of Commercial Space Transportation; regional Flight Standards; Airports Divisions; service area offices; the William J. Hughes Technical Center; the Mike Monroney Aeronautical Center; Technical Operations Aviation System Standards; all field facilities; international aviation field offices; and interested aviation public.

1–1–3. CANCELLATION

This order cancels Federal Aviation Administration Order (FAAO) 7400.2F, Procedures for Handling Airspace Matters, dated February 16, 2005.

1–1–4. EFFECTIVE DATE

This order is effective on April 10, 2008.

1–1–5. EXPLANATION OF CHANGES

a. This order has been revised to incorporate changes due to the new Air Traffic Organization and previously issued Policy Memorandums. Further, several editorial changes have been made to reflect organizational, policy, and procedural changes.

b. If further information is desired, please direct questions through the appropriate facility/service area/regional office to the headquarters office of primary responsibility.

1–1–6. CHANGE AUTHORITY

The Director of System Operations Airspace and AIM will issue changes to this directive after obtaining concurrence from the affected Headquarters offices/services/service units listed in the foreword.

Section 2. Authority and Order Use

1–2–1. POLICY

The navigable airspace is a limited national resource that Congress has charged the Federal Aviation Administration (FAA) to administer in the public interest as necessary to ensure the safety of aircraft and its efficient use. Although the FAA must protect the public's right of freedom of transit through the airspace, full consideration shall be given to all airspace users, to include national defense; commercial and general aviation; and space operations. Accordingly, while a sincere effort shall be made to negotiate equitable solutions to conflicts over the use of the airspace for nonaviation purposes, preservation of the navigable airspace for aviation shall be the primary emphasis.

1–2–2. AUTHORITY AND APPLICABILITY

The authority for the procedures and associated rules and regulations addressed in this order are provided in 49 U.S.C. Subtitle VII, Aviation Programs, Part A – Air Commerce and Safety, and Part B – Airport Development and Noise:

a. Section 40101, Policy.

b. Section 40102, Definitions.

c. Section 40103, Sovereignty and Use of Airspace, and the Public Right of Transit.

d. Section 40106(a), Deviations From Regulations.

e. Section 40109, Authority to Exempt.

f. Section 40113, Administrative.

g. Section 44501(a), Long Range Plans and Policy Requirements.

h. Section 44502, General Facilities and Personnel Authority.

i. Section 44502(c), Military Construction, Rockets, and Missiles.

j. Section 44718, Structures Interfering with Air Commerce.

k. Section 44719, Standards for Navigational Aids.

l. Section 44720, Meteorological Services.

m. Section 44721, Aeronautical Maps and Charts.

n. Section 46104(e), Designating Employees to Conduct Hearings.

o. Section 46301, Civil Penalties.

p. Section 46308, Interference with Air Navigation.

q. Chapter 471, Airport Development – All of Subchapters I and II.

r. Chapter 475, Noise – All of Subchapters I and II.

1–2–3. TITLE 14 CODE OF FEDERAL REGULATIONS (CFR) REFERENCES

a. Part 11, General Rulemaking Procedures.

b. Part 71, Designation of Class A, B, C, D, and E Airspace Areas; Air Traffic Service Routes; and Reporting Points.

c. Part 73, Special Use Airspace.

d. Part 77, Objects Affecting Navigable Airspace.

e. Part 91, General Operating and Flight Rules.

f. Part 93, Special Air Traffic Rules.

g. Part 95, IFR Altitudes.

h. Part 97, Standard Instrument Approach Procedures.

i. Part 101, Moored Balloons, Kites, Unmanned Rockets and Unmanned Free Balloons.

j. Part 152, Airport Aid Program.

k. Part 157, Notice of Construction, Alteration, Activation, and Deactivation of Airports.

l. Chapter III, Commercial Space Transportation.

m. Chapter V, National Aeronautics and Space Administration.

1–2–4. FUNCTIONAL RESPONSIBILITIES

Functional responsibilities of headquarters and regional/service area organizations referred to in this order are detailed in Order 1100.1, FAA Organization – Policies and Standards; Order 1100.2, Organization – FAA Headquarters; and Order 1100.5, FAA Organization – Field.

1–2–5. WORD USAGE

The concept of word usage and intended meaning as used in this order is set forth below:

a. "Shall" or a command verb is used when application is mandatory.

b. "Shall not" is used when an action is prohibited.

c. "Should" is used when application is recommended.

d. "May" and "need not" are used when application is optional.

e. "Will" is used only to indicate futurity, never to indicate any degree of requirement for application of a procedure.

f. "Navigable airspace" is airspace at or above the minimum altitudes of flight prescribed by the Code of Federal Regulations, and shall include airspace needed to ensure safety in the takeoff and landing of aircraft. By policy, the term "airspace above minimum altitudes of flight" is interpreted to mean "airspace at or above minimum flight altitudes."

g. "Controlled airspace" is a generic term used to describe Class A, Class B, Class C, Class D, and Class E airspace.

1–2–6. ABBREVIATIONS

As used in this manual, TBL 1–2–1 contains abbreviations found in this order and their meanings.

1–2–7. ORDER CHANGES

a. This order will be updated semiannually.

b. The responsibility associated with processing and coordinating revisions to this order is delegated to the Manager, Airspace and Rules.

c. Proposed changes or recommended revisions must be submitted, in writing, to Airspace and Rules. The proposal should include a description of the proposal, and the language to be inserted in the order.

d. When appropriate, Airspace and Rules may convene a workgroup for the purpose of reviewing, clarifying, editing, or revising recommendations received to revise this order. Composition of the workgroup will be determined by the subject matter, and the expertise required. Airspace and Rules is responsible for the selection of the members of the workgroup, and for appointing the chairperson of the group.

e. The workgroup shall study the proposal, and, when appropriate, provide their recommendation to the Obstruction Evaluation (OE) Executive Council no later than 90 days after the workgroup adjourns. The Executive Council shall consist of the directors of the service units and the service managers/directors of the lines of business within the FAA who have responsibility for administering the obstruction evaluation program.

f. The Executive Council shall approve, reject, revise, or return the recommendation to the workgroup for further study. If approved by the Executive Council, the recommendation shall be published and effective in the next revision of this order.

g. When revised, reprinted, or additional pages are issued, they will be marked as follows:

1. Each revised or added page will show the change number and effective date of the change.

2. Bold vertical lines in the margin of the text will mark the location of substantive procedural, operational, or policy changes (e.g., when material that affects the performance of duty is added, revised, or deleted).

TBL 1–2–1

FAA Order Abbreviations

A/FD	Airport/Facility Directory
AAS	Office of Airport Safety and Standards
ADO	Airport District Office
AE	Airport Elevation
AFS	Flight Standards Service
AFSS	Automated Flight Service Station
AGC	Office of the Chief Counsel
AGL	Above Ground Level
AIM	Aeronautical Information Management
ALP	Airport Layout Plan
APO	Office of Aviation Policy and Plans
APP	Office of Airport Planning and Programming
ARP	Airport Reference Point
ARSR	Air Route Surveillance Radar
ARTCC	Air Route Traffic Control Center
ARU	Airborne Radar Unit
ASR	Spectrum Policy and Management

AST	Office of Commercial Space Transportation
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
ATCRBS	Air Traffic Control Radar Beacon System
ATCSCC	David J. Hurley Air Traffic Control System Command Center
ATCT	Airport Traffic Control Tower
ATO	Air Traffic Organization
ATREP	Air Traffic Representative
CARF	Central Altitude Reservation Function
CDRH	Center for Devices and Radiological Health
CFA	Controlled Firing Area
CFZ	Critical Flight Zone
CFR	Code of Federal Regulations
CP	Construction Permit
DF	Directional Finder
DME	Distance Measuring Equipment
DMS	Docket Management System
DNE	Does Not Exceed
DNH	Determination of No Hazard
DOD	Department of Defense
DOH	Determination of Hazard
EBO	Exceeds But Okay
EMI	Electromagnetic Interference
ERP	Effective Radiated Power
FAAO	Federal Aviation Administration Order
FACSFAC	Fleet Area Control and Surveillance Facility
FCC	Federal Communications Commission
FDA	Food and Drug Administration
FL	Flight Level
FPO	Flight Procedures Office
FSDO	Flight Standards District Office
FSS	Flight Service Station
GAO	Government Accountability Office

HIL	High Intensity Light
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IR	IFR Military Training Route
IRAC	Interdepartmental Radio Advisory Committee
J	Joule
L/MF	Low/Medium Frequency
LFZ	Laser Free Zone
LLWG	Local Laser Working Group
LMM	Middle Compass Locator
LOA	Letter of Agreement
LOD	Letter of Determination
LOM	Outer Compass Locator
LSO	Laser Safety Officer
MAJCOM	Military Major Command
MCA	Minimum Crossing Altitude
MCP	Minimum Crossing Point
MEA	Minimum En Route Altitude
MHA	Minimum Holding Altitude
MIA	Minimum IFR Altitude
MLS	Microwave Landing System
MOA	Military Operations Area
MOCA	Minimum Obstruction Clearance Altitude
MPE	Maximum Permissible Exposure
MRAD	Milliradian
MRU	Military Radar Unit
MSA	Minimum Safe Altitude
MSL	Mean Sea Level
MTR	Military Training Route
MVA	Minimum Vectoring Altitude
NACO	National Aeronautical Charting Group
NAD	North American Datum
NAS	National Airspace System

NASA	National Aeronautics and Space Administration
NAVAID	Navigational Aid
NDB	Nondirectional Radio Beacon
NEPA	National Environmental Policy Act
NFDD	National Flight Data Digest
NFZ	Normal Flight Zone
NM	Nautical Mile
NPH	Notice of Presumed Hazard
NOHD	Nominal Ocular Hazard Distance
NOTAM	Notice to Airmen
NPIAS	National Plan of Integrated Airport Systems
NPRM	Notice of Proposed Rulemaking
NR	Nonrulemaking
NRA	Nonrulemaking Airport
NSA	National Security Area
NWS	National Weather Service
OE	Obstruction Evaluation
OE/AAA	Obstruction Evaluation/Airport Airspace Analysis
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PFC	Passenger Facility Charge
PL	Public Law
PSR	Project Status Request
RBS	Radar Bomb Site
REIL	Runway End Identifier Lights

RNAV	Area Navigation
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RVR	Runway Visual Range
RVV	Runway Visibility Value
SFZ	Sensitive Flight Zone
SIAP	Standard Instrument Approach Procedure
SMO	System Maintenance and Operations
SR	Scientific/Research Lasers
STAR	Standard Terminal Arrival Route
SUA	Special Use Airspace
TERABA	Termination/Abandoned Letter
TEREXP	Termination/Expired Letter
TERPS	United States Standard for Terminal Instrument Procedures
TERPSR	Termination Project Status Letter
TOFA	Taxiway Object Free Area
USC	United States Code
UTC	Coordinated Universal Time
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rule
VGSI	Visual Glide Scope Indicator
VOR	Very High Frequency Omnidirectional Range
VORTAC	Very High Frequency Omni-Directional Radio Range and Tactical Air Navigation Aid
VR	VFR Military Training Route

Chapter 2. Rulemaking/Nonrulemaking Airspace Cases

Section 1. Ex Parte Communications

2–1–1. DEFINITION

An ex parte contact is any communication between the FAA and a party outside the government related to a specific rulemaking proceeding, before that particular proceeding is finalized. A rulemaking proceeding does not close until all received comments have been addressed, and a final rule is published. "Ex parte" is a Latin term that is interpreted to mean "one sided," and indicates that not all parties to an issue were present when it was discussed. Because some interested persons, including the general public, are excluded from an ex parte communication, such a contact may give rise to the appearance of impropriety.

NOTE–
Written comments submitted to the docket are not considered ex parte contacts because they are available for inspection by all members of the public.

2–1–2. SCOPE

Whether ex parte contacts are initiated by the FAA or by a member of the public (including affected industry), they are improper if they affect the basic openness and fairness of the decision making process. Because of this possibility and because of the possible appearance of impropriety, the FAA's policy on ex parte contacts is very strict. This policy, however, does not significantly restrict the gathering of information needed to make an intelligent decision.

2–1–3. POLICY

The FAA encourages full public participation in rulemaking actions. This policy allows for appropriate ex parte contacts when necessary to ensure adequate public comment. Persons directly responsible for the rulemaking/nonrulemaking action should, in addition to providing the public the opportunity to respond in writing to proposed actions and/or to appear and be heard at a hearing, undertake such contacts with the public as will be helpful in resolving questions of substance and justification. Responsible persons should be receptive to proper contacts from members of the public who are affected by, or interested in, the proposed action. Contacts with the public to obtain up–to–date information needed for the rulemaking action or to clarify written comments, are also permissible.

2–1–4. DISCLOSURE

While this policy recognizes the importance of ex parte contacts, it also contains a strict mandate to disclose these contacts. Specifically, the FAA has an obligation to conduct its rulemaking activities in a public manner, whereby interested members of the public are afforded adequate knowledge of such contacts. This is necessary to ensure all interested members of the public are afforded the opportunity to make their views known to the FAA. Without such disclosure, other interested members of the public and the FAA may be deprived of informed and valuable comments.

2–1–5. PERMITTED CONTACT

The kind of ex parte contacts permitted and the procedures to be followed depend on when the contact occurs. Any questions regarding the following authorized contacts should be addressed by the Office of the Chief Counsel.

a. Before the issuance of any rulemaking and/or nonrulemaking action, ex parte contacts are authorized when needed to obtain technical and economic information. Each contact that influenced the specific effort shall be included in a report discussing each contact or group of related contacts. This report shall be placed in the project's docket/case file.

b. During the comment period, ex parte contacts are strongly discouraged, since requests for information can be submitted in writing or at a public meeting. The only information that should be released is that contained in the proposed rule and any other information made generally available during a public meeting. Information, such as facts not presented in the rulemaking/nonrulemaking

notification or at a public meeting, or the agency's preliminary thinking on the final rule, should not be discussed. Persons who contact the agency by telephone or in person seeking to discuss the proposal should be advised that the proper avenue of communication during the comment period is by written comment submitted to the docket. When the agency determines that it would be helpful to meet with a person or group during the comment period, the meeting must be announced in the Federal Register and all interested persons must be invited.

c. In a formal public hearing, the testimony is usually recorded and the transcript added to the docket. Summaries of all substantive oral communications and copies of materials provided that could affect the agency position must be placed in the docket. Individuals who have made oral comments at meetings should be encouraged to also submit those comments to the docket in writing.

d. Persons who contact the agency simply to obtain information regarding the proposal may be provided with information that has already been made available to the general public. No record of such a contact is required.

e. Once the comment period has closed, subsequently received written communications should also be placed in the docket. Inform those who wish to submit such "late filed" comments (in accordance with Part 11), their comments will be given consideration to the extent that they cause no undue expense or delay.

f. If the agency determines that it would be helpful to meet with a person or group after the close of the comment period, the meeting must be announced in the Federal Register. Moreover, consideration should be given to reopening the comment period. Substantive oral communications other than formal meetings are discouraged. If it is discovered that such a contact has occurred, a summary of the contact must be placed in the docket if it could be perceived as influencing the rulemaking process. Such a summary must be accompanied by copies of any material distributed during meetings between the FAA and interested parties.

g. Contacts after the close of the comment period should be avoided. However, if an ex parte communication occurs that could substantially influence the rulemaking after the comment period has closed, it is the FAA's policy to consider reopening the comment period. Important information should not be disregarded simply because it was late. However, because contacts after the close of the comment period may result in reopening the comment period, they should be avoided. Written comments received after the closing date do not require reopening the comment period unless the agency is substantially and specifically influenced by the comment.

2–1–6. RECORDING CONTACTS

A record of a contact or series of contacts need only be made when it is determined that the contact influenced the agency's action. The record of a contact or series of contacts may be made at any time after the contact, but must be made before issuance of the final action. The record of ex parte contacts need not be a verbatim transcript of the communication. However, a mere recitation that on a stated day a meeting or telephone conversation was held with listed persons to discuss a named general subject is inadequate. The report of the meeting or contact should contain at a minimum:

a. The date and time of the meeting or conversation.

b. A list of the participants.

c. A summary of the discussion (more than a simple list of the subjects discussed).

d. A specific statement of any commitments made by any FAA personnel. A copy of any documents discussed should be attached to the record. Any questions on the preparation of the record should be directed to the Office of the Chief Counsel.

2–1–7. ADVICE FROM COUNSEL

Questions concerning the propriety of ex parte contacts, or the actions to be taken after such contacts, should be directed to the Office of the Chief Counsel. Ex parte contacts must be handled correctly to prevent unwarranted delay and legal challenge.

2–1–8. RELEASE OF RULEMAKING AND/OR NONRULEMAKING TEXTS

The agency policy is to not provide outside parties the texts of rulemaking/nonrulemaking documents before official release. Such disclosures may give the

appearance that the agency is seeking outside party approval and may give an advantage to some parties over other members of the public. There is one exception to this policy. It may be necessary to discuss possible specific regulatory provisions under consideration to obtain information on technical, operational, and economic impacts needed for agency deliberations. Avoid discussion of specific language unless needed information cannot be obtained without discussion of the precise technical language to be used. When necessary, limit discussion and disclosure to the minimum amount of rule text necessary to accomplish the task. Preamble text is not to be distributed before publication.

Section 2. Executive Order 10854

2–2–1. SCOPE

a. Executive Order 10854 extends the application of 49 U.S.C. Section 40103 to the overlying airspace of those areas of land or water outside the United States beyond the 12–mile offshore limit in which the United States, under international treaty agreement or other lawful arrangements, has appropriate jurisdiction or control.

b. Under the provisions of Executive Order 10854, airspace actions must be consistent with the requirements of national defense, international treaties or agreements made by the United States, or the successful conduct of the foreign relations of the United States.

NOTE–
The full text of Executive Order 10854 is detailed in FIG 2–2–1.

2–2–2. POLICY

Any rulemaking or nonrulemaking actions that encompass airspace outside of the United States sovereign airspace (e.g., beyond 12–miles from the United States coast line) require coordination with the Departments of Defense and State. All Executive Order 10854 coordination shall be conducted at the FAA headquarters level by Airspace and Rules.

FIG 2–2–1
Executive Order 10854

EXECUTIVE ORDER 10854
EXTENSION OF THE APPLICATION OF THE FEDERAL AVIATION ACT OF 1958
By virtue of the authority vested in me by section 1110 of the Federal Aviation Act of 1958 (72 Stat. 800: 49 U.S.C. 1510), and as President of the United States, and having determined that such action would be in the national interest, I hereby order as follows:
The application of the Federal Aviation Act of 1958 (72 Stat. 731; 49 U.S.C. 1301 et seq.), to the extent necessary to permit the Secretary of Transportation to accomplish the purposes and objectives of Titles III and XII thereof (49 U.S.C. 1341–1355 and 1521–1523), is hereby extended to those areas of land or water outside the United States and the overlying airspace thereof over or in which the Federal Government of the United States, under international treaty, agreement or other lawful arrangement, has appropriate jurisdiction or control: Provided, that the Secretary of Transportation, prior to taking any action under the authority hereby conferred, shall first consult with the Secretary of State on matters affecting foreign relations, and with the Secretary of Defense on matters affecting national–defense interests, and shall not take any action which the Secretary of State determines to be in conflict with any international treaty or agreement to which the United States is a party, or to be inconsistent with the successful conduct of the foreign relations of the United States, or which the Secretary of Defense determines to be inconsistent with the requirements of national defense.
Dwight D. Eisenhower
The White House, November 27, 1959

Section 3. Airspace Planning and Analysis

2–3–1. BACKGROUND

a. Airspace management functions historically have been widely dispersed. Responsibility for airspace management has resided with the regions/service area offices, while airspace changes for operational considerations have been handled by field facilities. The focus on airspace change and redesign has been local in scope and centered, for the most part, on single areas. It is apparent that changes in airspace configuration, architecture, or structure have national implications for air traffic control, for traffic flow management, and for the user community. Therefore, changes in the use or allocation of the airspace need to be coordinated at the national level.

b. The details involved in airspace design must be centrally located. It is essential that efforts expended on airspace studies and proposed airspace changes be coordinated at the national level. This coordination will ensure that resources are effectively prioritized and optimized for the efficient use of the nation's airspace.

2–3–2. POLICY

The air traffic planning and analysis policy uses an interdisciplinary approach to ensure the effective management of national airspace changes. This policy requires national implementation strategies, especially for changes designed to enhance user operations, maintain the highest standards of safety, generate new efficiencies, and effectively use our resources. With this policy in mind, Airspace and Rules is designated as the air traffic office that will provide national oversight for:

a. Formulating airspace efficiency policy.

b. Establishing guidelines for airspace architecture and structural changes.

c. Analyzing current and proposed operations for efficiency.

Section 4. Processing Rulemaking Airspace Actions

2–4–1. PURPOSE

This section prescribes procedures to be followed when taking rulemaking actions to establish, modify, or revoke regulatory airspace.

2–4–2. RESPONSIBILITY

a. Airspace and Rules is responsible for processing the following actions: Class A, B, and C airspace areas; special use airspace; offshore airspace areas; airways; jet routes; and those Class D and E airspace areas that overlie U.S. territories and possessions.

b. The Operations and Air Traffic Law Branch, AGC–220, is responsible for ensuring that the airspace cases listed in paragraph a, above, meet the requirements of the Administrative Procedures Act.

c. Service area offices are responsible for processing all Class D and E airspace area cases.

d. The Assistant Chief Counsel for each region is responsible for ensuring that all regional airspace cases meet the requirements of the Administrative Procedures Act.

2–4–3. DOCKETS

a. Docket Location.

1. The official docket for both Headquarters' and regional/service area office rulemaking cases shall be maintained at the Docket Management System, U.S. Department of Transportation, Room Plaza 401, 400 Seventh Street, SW., Washington, DC 20590–0001.

2. The Docket Management System (DMS) can also be accessed on the internet at http://dms.dot.gov.

b. Docket Identification.

1. Rulemaking cases shall be identified by two docket numbers. The first, an FAA docket number, includes the acronym FAA; the current year; and a consecutively assigned number (e.g., FAA–2003–14010). The second, an airspace docket number, includes the last two digits of the calendar year; the abbreviation of the originating office; and a consecutively assigned number (e.g., 00–ASW–46).

2. Numbers shall run consecutively within each calendar year.

c. Docket Content. The official docket shall include all petitions, notices, rules, comments, correspondence, and related material concerning the case (other than working files).

2–4–4. FLIGHT PROCEDURAL DATA

a. If an airspace docket requires a procedure change and/or flight inspection, service area office shall coordinate the proposed effective date with the regional Flight Procedures Office, (FPO). The proposed effective date must consider the time needed to process procedural changes and allow ample time for flight inspection, if required. The FPO shall notify the service area office of any problems that could affect the proposed effective date. See Order 8260.26, Establishing and Scheduling Standard Instrument Procedure Effective Dates, for scheduled processing and publication dates.

b. If a rule without notice is to be issued and flight check data is required, the service area office shall inform the responsible FPO of the action and specific data requested.

2–4–5. SUBMISSION OF AIRSPACE CASES TO HEADQUARTERS

a. The service area office shall review the action proposed and submit a complete technical description of the proposed airspace (e.g., establishment, modification, or revocation) package to Airspace and Rules.

b. All background information including charts, proper justification and appropriate recommendations shall be submitted.

c. If an airspace action needs to be completed by a specific date, the service area office shall coordinate with the FPO and any other FAA offices as necessary to ensure that sufficient lead–time exists for meeting normal airspace procedural processing and charting requirements, and instrument approach procedure development.

d. The service area office shall submit to Airspace and Rules written comments received in response to the proposed action, analysis of the comment(s), and

any recommendations within 30 days after the comment closing date. If applicable, a statement concerning the status of the flight procedures data (e.g., Minimum En Route Altitude, MEA; or Change Over Point, COP) for en route cases shall be included.

2–4–6. EFFECTIVE DATE OF FINAL RULES

a. Amendments to parts 71 and 73 shall be made effective at 0901 Coordinated Universal Time (UTC) and shall coincide with en route charting dates as furnished by Airspace and Rules. Exceptions are as follows:

1. Safety or national interest actions that require an earlier effective time or date.

2. Editorial changes.

3. 700–foot floor Class E airspace areas that underlie existing 1,200–foot Class E airspace areas.

4. Actions that lessen the burden on the public (e.g., revocation of restricted areas).

5. Class B and C airspace areas shall be made effective on days that coincide with the appropriate sectional aeronautical charting dates.

b. Cutoff dates are established to allow sufficient time for charting and chart distribution purposes. Rules should be signed on or before the applicable cutoff date.

2–4–7. PUBLICATION IN FEDERAL REGISTER

An original Notice of Proposed Rulemaking (NPRM) and three copies, or an original final rule and seven copies shall be forwarded to AGC–200 for publication in the Federal Register.

2–4–8. DISTRIBUTION

Distribution of airspace dockets (NPRMs and final rules) shall be consistent with the procedures set forth in Order 1720.18, FAA Distribution System.

Section 5. Processing Nonrulemaking Airspace Actions

2–5–1. PURPOSE

This section prescribes procedures to be followed when establishing, modifying, or revoking nonrulemaking airspace (e.g., Military Operations Area, warning areas, etc.).

2–5–2. IDENTIFICATION

Identify nonrulemaking cases by a study number that includes the last two digits of the calendar year, the abbreviation of the appropriate regional or airports district office, a consecutively assigned number within each calendar year, and "NR" (nonrulemaking), "NRA" (nonrulemaking airport), or "OE" (obstruction evaluation) as appropriate.

EXAMPLE–

1. *00–AWP–1–NR for studies involving navigational aids and nonrulemaking Special Use Airspace (SUA) cases (i.e., Alert Areas, Controlled Firing Areas, MOAs, and Warning Areas).*

2. *00–ASO–1–NRA for studies involving airports.*

3. *00–AGL–1–OE for studies involving surface structures.*

4. *00–ORL–1–NRA for studies processed by an airports district office.*

2–5–3. CIRCULARIZATION

a. Except for NRA airspace proposals, nonrulemaking airspace proposals shall be circularized by the service area office unless procedures for processing particular types of proposals allow exemptions to circularization. Each notice shall contain a complete, detailed description of the proposal including charts, if appropriate, that will assist interested persons in preparing comments. Circularization lists shall include, but not be limited to, all known aviation interested persons and groups such as the state aviation agencies; regional military representatives; national and local offices of aviation organizations; local flight schools, local airport owners, managers, and fixed base operators; and local air taxi and charter flight offices. Normally, a 45–day comment period should be provided. Other parts in this order contain additional guidance regarding circularization.

b. Identify in the nonrulemaking circular any regulatory changes (e.g., part 71) that will be effected if the nonrulemaking proposal is adopted. Describe the regulatory changes in as much detail as is known at the time (e.g., radials, distances, and coordinates).

c. Regions/service area offices shall coordinate with their respective state aviation representatives to ascertain which nonrulemaking circulars each state is interested in receiving. If various agencies within a state government request copies of particular circulars, the region/service area office may request that one agency be designated to receive and distribute the requested copies.

d. Send one copy of each nonrulemaking circular to Airspace and Rules.

e. Except for Class B and Class C airspace actions, when a nonrulemaking action is ancillary to a rulemaking action, the nonrulemaking proposal may be included in the NPRM. In this instance, a nonrulemaking circularization need not be made. The NPRM will satisfy the circularization requirement and present the full impact of both the rule and nonrule proposal.

2–5–4. CIRCULARIZATION DOCUMENTATION

All notices of aeronautical studies, informal airspace meetings, and determinations issued for obstruction evaluation and airport airspace analysis studies require certificates of mailing. The certificate shall be recorded in each case file as follows:

AERONAUTICAL STUDY [NUMBER]
CERTIFICATE OF MAILING
I HEREBY CERTIFY THAT A COPY OF THE ATTACHED [notice/determination] WAS MAILED TO EACH OF THE ADDRESSEES LISTED ON THE ATTACHED [mailing list/distribution list number] THIS [date] DAY OF [month/year].
SIGNED: [specialist/mail clerk/etc.]

2–5–5. EFFECTIVE DATE OF NONRULEMAKING ACTIONS

Nonrulemaking actions shall be made effective at 0901 UTC and shall coincide with en route charting dates as furnished by Airspace and Rules. Exceptions are as follows:

a. Safety or national interest actions that require an earlier effective time or date.

b. Editorial changes.

c. Actions that lessen the burden on the public (e.g., revocation of special use airspace).

2–5–6. PUBLICATION OF NONRULEMAKING ACTIONS

Nonrulemaking actions are published in the National Flight Data Digest (NFDD) on or before the applicable charting cutoff date.

Section 6. Informal Airspace Meeting

2–6–1. PURPOSE

This section prescribes the procedures to be followed for all notices of informal airspace meetings held in advance of rulemaking/nonrulemaking airspace actions.

2–6–2. POLICY

a. It is the policy of the FAA to hold, if at all practicable, informal airspace meetings to inform the affected users of planned airspace changes. The purpose of these meetings is to gather facts and information relevant to the planned rulemaking or nonrulemaking action being studied.

b. Notwithstanding paragraph 2–6–2.a. informal airspace meetings shall be held for any planned changes to Class B and Class C airspace areas prior to issuing an NPRM.

2–6–3. CLASS B AND C AIRSPACE AREAS NOTIFICATION PROCEDURES

a. The regional/service area office shall submit a draft notice of informal airspace meetings to Airspace and Rules for processing and publication in the Federal Register. The notice shall describe the proposal in sufficient detail, including charts, if necessary, to enable interested persons to prepare comments prior to the meeting. The notice shall identify the name and address of the office where additional information can be obtained.

b. Airspace and Rules shall process and submit the notice for publication in the Federal Register. For Class B airspace areas, the notice shall be published a maximum of 90 days, and a minimum of 60 days in advance of the meeting.

c. For Class C airspace areas, the notice shall be published a maximum of 60 days, and a minimum of 30 days in advance.

d. In addition to the above, notices of informal airspace meetings shall be sent to all known licensed pilots, state aviation agencies, airport managers/operators, and operators of parachute, sailplane, ultralight, and balloon clubs within a 100–mile radius of the primary airport for Class B airspace actions; and within a 50–mile radius of the primary airport for Class C airspace actions.

e. Distribution of these notices may be accomplished through the facilities of the Airmen Certification Branch, AFS–760. The regional office should coordinate this distribution with the regional Aviation Safety Program Manager. It should be noted that AFS–760 needs a lead–time of 16 days from the receipt of material until mailing. Sufficient lead–time must be provided to allow processing and distribution in time to meet the above minimum advance notice requirements (e.g., 60/30 days).

f. When known or anticipated controversy warrants, the above procedures may also be used for informal airspace meeting notices concerning obstruction evaluation, airport airspace analysis, special use airspace, and the commissioning/decommissioning of navigational aids.

2–6–4. OTHER AIRSPACE ACTIONS

a. Every effort shall be made to notify all aviation organizations and/or persons that may be affected by, or interested in, the planned action. The meeting notice shall explain that the purpose of the meeting is to solicit aeronautical comments on the proposal's effect on the planned action.

b. The notice shall describe the planned action in sufficient detail, including charts if necessary, to enable interested persons to prepare comments prior to the meeting. Notice of the meeting should be distributed at least 30 days prior to the meeting date.

c. Regional/service area offices are also encouraged to make use of electronic media, local newspapers, radio, and television to supplement the dissemination of notices and information.

2–6–5. LOCATION

Informal airspace meetings should be held at times and locations that are most conducive for gathering facts relative to the planned or proposed action under study. The chairperson shall represent the Regional Administrator. Each informal airspace meeting should be numbered consecutively and dated (e.g., "Meeting No. 50, February 15, 2000").

Part 5. Special Use Airspace

Chapter 21. General

Section 1. Policy

21–1–1. PURPOSE

In addition to the policy guidelines and procedures detailed in Part 1. of this order, this part prescribes specific policies and procedures for handling special use airspace (SUA) cases.

21–1–2. SCOPE

The primary purpose of the SUA program is to establish/designate airspace in the interest of National Defense, security and/or welfare. Charted SUA identifies to other airspace users where these activities occur.

21–1–3. DEFINITION AND TYPES

a. SUA is airspace of defined dimensions wherein activities must be confined because of their nature, or wherein limitations may be imposed upon aircraft operations that are not a part of those activities.

b. The types of SUA areas are Prohibited Areas, Restricted Areas, Military Operations Areas (MOA), Warning Areas, Alert Areas, Controlled Firing Areas (CFA), and National Security Areas (NSA).

21–1–4. CATEGORIES

There are two categories of SUA: regulatory (rulemaking) and other than regulatory (nonrulemaking). Prohibited Areas and Restricted Areas are rulemaking actions that are implemented by a formal amendment to part 73. MOAs, Warning Areas, Alert Areas, CFAs, and NSAs are nonrulemaking actions.

21–1–5. SUA APPROVAL AUTHORITY

FAA Headquarters is the final approval authority for all permanent and temporary SUA, except CFA's. CFA approval authority is delegated to the service area office. The service area office shall forward those proposals recommended for approval (except CFA) to FAA Headquarters for a final determination.

NOTE–
Final approval of Warning Areas is shared with other agencies per Executive Order 10854. Warning Area proposals, except controlling or using agency changes, must be coordinated with the Department of State and the Department of Defense for concurrence. Airspace and Rules is responsible for accomplishing this coordination.

21–1–6. MINIMUM NUMBERS AND VOLUME

The dimensions and times of use of SUA shall be the minimum required for containing the proposed activities, including safety zones required by military authority. When it is determined that a specified SUA area is no longer required, the using agency, or the appropriate military authority, shall inform the service area office that action may be initiated to return the airspace to the NAS.

21–1–7. OPTIMUM USE OF AIRSPACE

a. To ensure the optimum use of airspace, using agencies shall, where mission requirements permit, make their assigned SUA available for the activities of other military units on a shared–use basis.

b. SUA should be located to impose minimum impact on nonparticipating aircraft and ATC operations. This should be balanced with consideration of the proponent's requirements. To the extent practical, SUA should be located to avoid airways/jet routes, major terminal areas, and known high volume VFR routes.

c. Consider subdividing large SUA areas, where feasible, in order to facilitate the real–time release of the airspace when activation of the entire area is not required by the user.

NOTE–
Policies concerning airspace utilization for military operations are contained in FAAO JO 7610.4, Chapter 9, Military Operations Requirements.

21-1-8. JOINT-USE POLICY

a. Under the "joint-use" concept, SUA is released to the controlling agency and becomes available for access by nonparticipating aircraft during periods when the airspace is not needed by the using agency for its designated purpose.

b. Restricted areas, warning areas, and MOAs shall be designated as "joint-use" unless it is demonstrated that this would result in derogation to the using agency's mission. For certain SUA areas, joint use may be impractical because of the area's small size, geographic location, or high level of use in such areas. In these cases, the airspace proposal package must include specific justification of why joint-use is not appropriate.

c. Joint-use does not apply to prohibited areas. Alert areas and CFAs are essentially joint-use because nonparticipating aircraft may transit these areas without limitation.

d. Joint-use procedures shall be specified in a joint use "Letter of Procedure" or "Letter of Agreement" between the using agency and the controlling agency. These letters should include provisions for the real-time activation/deactivation of the airspace, where such capabilities exist. They should also provide for the timely notification to the controlling agency when the scheduled activity has changed, been canceled, or was completed for the day.

e. Using agencies shall ensure that joint-use SUA is returned to the controlling agency during periods when the airspace is not needed nor being used for its designated purpose.

21-1-9. ENVIRONMENTAL ANALYSIS

a. SUA actions, except as listed in paragraph b, below, are subject to environmental impact analysis in accordance with the National Environmental Policy Act of 1969 (NEPA). Guidance for the environmental analysis of SUA proposals is contained in FAAO 1050.1, Policies for Considering Environmental Impacts, other relevant FAA directives; the FAA/DOD Memorandum of Understanding Concerning Special Use Airspace Environmental Assessment; and other applicable regulations and statutes.

b. Prohibited area and alert area designations are actions that are neither permissive nor enabling. As such, environmental assessments or statements are not required when designating these areas (see FAAO 1050.1, Environmental Impacts: Policies and Procedures).

21-1-10. CONTROLLING AGENCY

The controlling agency is the FAA ATC facility that exercises control of the airspace when an SUA area is not activated. A military ATC facility may be assigned as the controlling agency, subject to the concurrence of the service area office and the concerned ARTCC. A controlling agency shall be designated for each joint-use SUA area.

21-1-11. USING AGENCY

a. The using agency is the military unit or other organization whose activity established the requirement for the SUA. The using agency is responsible for ensuring that:

1. The airspace is used only for its designated purpose.

2. Proper scheduling procedures are established and utilized.

3. The controlling agency is kept informed of changes in scheduled activity, to include the completion of activities for the day.

4. A point of contact is made available to enable the controlling agency to verify schedules, and coordinate access for emergencies, weather diversions, etc.

REFERENCE-
FAAO JO 7610.4, Chapter 9, Military Operations Requirements.

b. Restricted area and MOA using agencies are responsible for submitting Restricted Area/MOA Annual Utilization Reports in accordance with Section 7 of this chapter.

c. An ATC facility may be designated as the using agency for joint-use areas when that facility has been granted priority for use of the airspace in a joint-use letter of procedure or letter of agreement.

21-1-12. WAIVERS

The establishment of SUA does not, in itself, waive compliance with any part of the Code of Federal Regulations. DOD has been granted a number of waivers, exemptions, and authorizations to accomplish specific missions. Information about current waivers, exemptions, and authorizations granted for military operations may be obtained from FAA Headquarters, Airspace and Rules, or the Office of Rulemaking (ARM).

21-1-13. PUBLIC NOTICE PROCEDURES

Public notice procedures invite the public to comment on the impact of SUA proposals on the safe and efficient use of the navigable airspace. In addition to the public notice procedures described in chapter 2 of this order, SUA proposals are subject to the following:

a. All nonregulatory SUA proposals shall be circularized, and an NPRM shall be issued for all regulatory SUA proposals, except for those actions that clearly have no impact on aviation and are not controversial. A nonrulemaking circular or NPRM is not normally required for the following types of proposals:

1. Changes to the using or controlling agency.

2. Editorial changes to correct typographical errors.

3. Internal subdivision of an existing area to enhance real-time, joint-use (provided there is no change to the existing external boundaries) times of use, or type/level of activities.

4. Actions that lessen the burden on the flying public by revoking or reducing the size or times of use of SUA.

b. SUA nonrulemaking circulars are prepared and distributed by the service area office. FAA Headquarters prepares SUA NPRMs. Normally, circulars and NPRMs provide a minimum of 45 days for public comment.

c. When comments or coordination show that the proposal may be controversial, or there is a need to obtain additional information relevant to the proposal, an informal airspace meeting may be considered (see Chapter 2 of this order).

21-1-14. SUA NONRULEMAKING CIRCULARS

a. Prepare and distribute SUA nonrulemaking circulars as specified in Chapter 2 of this order and the additional requirements in this paragraph. Ensure wide dissemination to the potentially affected aviation user community. Send one copy of each SUA circular to Airspace and Rules and to the appropriate regional military representative(s).

b. CONTENT - Circulars should contain sufficient information to assist interested persons in preparing comments on the aeronautical impact of the proposal. SUA circulars should include:

1. A brief narrative that:

(a) Describes the purpose of the proposed airspace, the types of activities to be conducted, and the expected frequency of those activities. If the proposal modifies existing SUA, describe the changes and explain the desired result. For temporary MOA proposals, include a brief summary of the planned exercise or mission scenario.

(b) Discusses measures planned to minimize impact on nonparticipating aircraft, such as airport exclusions, joint-use procedures, limited activation times, etc. If there are known plans to provide real time area status information and/or traffic advisory services for nonparticipating pilots, include this information in the circular.

2. A complete description of the proposed area consisting of boundaries, altitudes, times of use, controlling agency, and using agency.

3. A copy of a sectional aeronautical chart depicting the boundaries of the proposed area.

4. The name and address (provided by the proponent) of the person to whom comments on the environmental and land-use aspects of the proposal may be submitted.

NOTE-
Do not include statements in the circular that certify NEPA compliance or state that environmental studies are complete. The proponent and/or FAA must consider environmental issues raised in response to the circular before a final determination is made on the proposal.

5. The issue date of the circular and the specific date that the comment period ends. Provide at least 45-days for public comment.

NOTE–
When selecting the comment closing date, consider the time needed for the preparation, printing and release of the circular, plus a representative mailing time, in order to afford the public the maximum time to submit comments.

c. SPECIAL DISTRIBUTION – In addition to the distribution requirements in Chapter 2, send copies of SUA nonrulemaking circulars to:

1. State transportation, aviation, and environmental departments (or the state clearing house if requested by the state).

2. Local government authorities, civic organizations, interest groups, or individuals that may not have an aeronautical interest, but are expected to become involved in a specific proposal.

3. Public libraries within the affected area requesting that the circular be displayed for public information.

4. Persons or organizations that have requested to be added to the circularization list.

NOTE–
1. *The service area office determines special distribution requirements in accordance with regional/service area office policies and considering the type of proposal, the potential for controversy, and the extent of possible aeronautical impact.*

2. *If the proposed airspace overlaps regional geographical boundaries or airspace jurisdictions, coordinate as required with adjacent regional/service area offices to ensure distribution of circulars to all appropriate parties.*

21–1–15. CHARTING AND PUBLICATION REQUIREMENTS

a. All SUA areas except CFAs, temporary MOAs, and temporary restricted areas, shall be depicted on aeronautical charts, and published as required in aeronautical publications.

b. Approved SUA actions normally become effective on the U.S. 56–day, en route chart cycle publication dates (see Part 1. of this order).

EXCEPTION–

Effective dates for temporary restricted areas, temporary MOAs, and CFAs are determined by mission requirements instead of the 56–day en route, charting date cycle.

c. Temporary areas shall be described in part 4, Graphic Notices, of the Notices to Airmen (NOTAM) Publication. Normally, publication of the graphic notice will begin two issues prior to the exercise start date and will continue through completion of the exercise. The notice shall include the area's legal description, effective dates, and a chart depicting the area boundaries. For large exercises, a brief narrative describing the exercise scenario, activities, numbers and types of aircraft involved, and the availability of in–flight activity status information for nonparticipating pilots should be included.

NOTE–
Submit temporary SUA graphic notice information, along with the airspace proposal package, to Airspace and Rules by the cutoff dates specified in the appropriate chapter of this order. All graphics submitted must be of high quality and in camera ready form. Facsimile copies are not suitable. Airspace and Rules will process and coordinate the notice with System Operations Airspace and AIM, Publications, for publication in the NOTAM Publication. Do not submit temporary SUA graphic notices directly to Publications.

d. When a SUA action becomes effective before it appears on the affected sectional chart(s), a description and map of the area will be published in part 4 of the NOTAM Publication. This information will be carried in the NOTAM Publication until the change has appeared on the affected sectional chart(s). Airspace and Rules is responsible for complying with this requirement.

NOTE–
1. *Minor editorial corrections to a SUA description or changes to the using or controlling agencies, will not be published in the NOTAM Publication.*

2. *In addition to the above, SUA designations or amendments that occur after publication of the latest sectional chart(s) will be listed in the "Aeronautical Chart Bulletin" section of the appropriate A/FD. This information will be carried in the A/FD until the change is published on the affected sectional chart(s).*

21–1–16. CERTIFICATION OF SUA GEOGRAPHIC POSITIONAL DATA

a. Geographic positional data for all permanent and temporary SUA boundaries (except CFAs) must be certified for accuracy by the NACO before publication and charting. Airspace and Rules shall submit proposed positional data to NACO for certification. Latitude and longitude positions used in

SUA descriptions shall be based on the current North American Datum.

b. Airspace and Rules shall forward any corrections or recommended changes made by NACO to the service area office. The service area office will forward the NACO changes to the regional military representative, or civil proponent, for review. The regional military representative/civil proponent will inform the service area office of its concurrence with NACO changes or reason for nonconcurrence. The service area office will advise FAA Headquarters of the proponent's conclusions. A record of this coordination shall be included in the airspace case file.

21-1-17. LEAD REGION

a. The regional office that is responsible for the geographical area containing the affected airspace processes the SUA proposal. When a proposal overlaps regional office geographical jurisdictions, the concerned service area office shall coordinate to determine which office will serve as the lead region for processing the proposal. Coordination between regions/service area offices is also required when the affected geographical area, and the ATC facility to be designated as controlling agency, are under the jurisdiction of different regional/service area offices.

b. Concerned regions shall ensure that:

1. All affected ATC facilities review the proposal and provide input to the aeronautical study, as required.

2. For nonregulatory proposals, distribution of nonrulemaking circulars includes interested parties in each regional jurisdiction, as necessary.

c. The airspace package submitted to headquarters shall include documentation of regional/service area office coordination, affected ATC facility comments and copies of public comments received.

Section 2. SUA Legal Descriptions

21–2–1. GENERAL

a. The legal description is the official airspace definition used for NAS database and charting purposes. This section provides guidelines and formats for preparing SUA legal descriptions. See TBL 21–2–1 for examples of regulatory and nonregulatory SUA legal descriptions.

b. All bearings and radials used in SUA legal descriptions are true from point of origin.

c. Mileage used in the description shall be expressed in nautical miles (NM).

d. Descriptions of approved SUA, except temporary areas and CFA's, are compiled and published once a year in FAAO JO 7400.8, Special Use Airspace. Updates to the order are not published between editions and the listings are considered current only as of the date specified in the order. For this reason FAAO JO 7400.8 should be used as a general reference only and should not be relied upon as a sole source when accurate positional data are needed (e.g., video maps, letters of agreement, etc). For up–to–date descriptions of SUA areas, contact Airspace and Rules or AIM.

21–2–2. LATERAL BOUNDARIES

a. SUA lateral boundaries are normally defined by geographic (latitude/longitude) coordinates. All coordinates shall be expressed in a "degrees, minutes, and seconds" format. Do not round off, or convert seconds to tenths of minutes (enter 00' and 00" to specifically reflect the "zero" minutes and "zero" seconds places respectively). See TBL 21–2–1 for examples.

b. Other methods may be used to define boundaries if necessary to simplify the description, such as defining the boundaries by reference to a NAVAID radial/DME. When a NAVAID is used as a reference point, include its geographic location in degrees, minutes, and seconds.

c. To aid pilots in area identification, boundaries may be aligned along a prominent terrain feature such as rivers, highways, railroad tracks, etc., provided the feature is clearly discernable from the air.

d. Except for temporary SUA areas, boundaries shall not be described as "along the boundary" of another designated airspace area.

e. Where feasible, consider subdividing large SUA areas to enhance joint use of the airspace.

21–2–3. VERTICAL LIMITS

a. For areas that contain aircraft operations exclusively, altitudes at or above 18,000 feet MSL shall be expressed as flight levels (FL).

b. For areas that contain other than aircraft operations, altitudes above 18,000 feet MSL shall be expressed in feet above MSL.

c. Where terrain considerations or other factors would make the use of an MSL altitude impractical, the floor of the area may be described in feet above ground level (AGL).

d. In describing SUA ceilings, unless otherwise specified in the description, the word "to" an altitude or flight level means "to and including" that altitude or flight level. If the upper vertical limit does not include the altitude or flight level, the ceiling shall be stated as "to but not including" the altitude or flight level.

e. Do not designate variable altitudes to describe the floor or the ceiling of an SUA area. When there is a requirement for the altitude of the floor or ceiling to change based on time of use, or geographic position within the SUA area, etc.; the differing sections shall be established as separate subdivisions.

EXCEPTION-
The floor of an area may be described using a combination of MSL and AGL altitudes if necessary due to terrain or operational considerations. For example, "5,000 feet MSL or 3,000 feet AGL, whichever is higher."

f. In limited situations, and provided a specific operational requirement exists, the same altitude may be used to describe both the ceiling of one SUA subdivision and the floor of an overlying subdivision. In this case, the same ATC facility shall be designated as the controlling agency for both subdivisions.

g. Where feasible consider stratification of SUA areas to enhance joint–use of the airspace.

21-2-4. TIMES OF USE

a. The times of use indicate the period during which the using agency is authorized to schedule and use a SUA area. These times should reflect when normal operations are expected to occur. In determining the times of use, the proponent should select the minimum period needed to meet the using agency's requirements. The goal is to capture the majority of the day-to-day activities. When the using agency has a requirement for intermittent, less frequent use of the airspace (outside the specific published time-period), a provision to activate the airspace by NOTAM may be stated in the SUA legal description.

NOTE-
The times of use should be based on the intended typical use of the area. These times are depicted on aeronautical charts to assist other airspace users in determining the most likely periods of area activation.

b. Times of use are stated using the options, or combination of options, shown below:

1. Specific hours/days. Local time using the 24-hour clock, and days of the week. If the time of use will change significantly on a seasonal basis, or mission requirements call for specific time blocks, variable times of use may be designated.

EXAMPLE-
1. *"0700 - 2200, Monday - Friday."*

2. *"Sep - Apr, 0800 - 1700, Monday - Friday; an May - Aug, 0600 - 2400 Monday - Friday."*

3. *"0800 - 0930 and 1300 - 1600, Monday - Friday."*

4. *"0700 - 1600, daily."*

NOTE-
1. *As used in SUA legal descriptions, the term "daily" means 7 days per week.*

2. *If the SUA area overlaps more than one local time zone, state the predominant time zone in the description, for example: "0700 - 1800 central time; Monday - Friday."*

2. Continuous. Use only when justification exists for utilization 24 hours a day, 365 days a year.

EXCEPTION-
"Continuous" may also be used when the area will be utilized 24 hours per day over a specific period, such as "Continuous, Monday - Friday;" or "Continuous, April - June."

3. NOTAM activation. Use "By NOTAM" or "Other Times by NOTAM" to indicate when a NOTAM must be issued in order to activate the area. NOTAM options are:

(a) "Other times by NOTAM." Used along with specific times to provide for activation of the area outside the specified times of use that were established according to b.1., above.

EXAMPLE-
"0700-1900 local time, Monday - Friday - other times by NOTAM."

(b) "By NOTAM," along with specific times from b.1., above: Used when issuance of a NOTAM is required prior to activating the area during the specified hours.

EXAMPLE-
1. *"By NOTAM 0700-1800 local time, Monday - Friday."*

2. *"0700-1800 local time, Monday - Friday, by NOTAM 4 hours in advance."*

(c) "By NOTAM" without specific times: Used when anticipated usage times cannot be specifically determined, or when the nature of the user's mission requires infrequent or erratic use.

(d) The NOTAM provision shall apply to the entire area and not only a portion thereof. If times of use will vary from one portion of the area to another, the dissimilar portions should be subdivided or redesignated as separate areas.

(e) NOTAMs should be issued as far in advance as feasible to ensure widest dissemination of the information to airspace users. Normally, the minimum advance notice should be at least 4 hours prior to the activation time.

NOTE-
Under no circumstances may SUA be activated by a NOTAM unless the words "By NOTAM" or "other times by NOTAM" are stated in the area's legal description.

4. Sunrise to sunset. This option should be reserved for cases where seasonal sunrise/sunset time variations make publication of specific clock times impractical.

5. Intermittent. Must include an associated time-period or "by NOTAM" provision. In any case, intermittent shall not be used for restricted areas without a "by NOTAM" provision.

EXAMPLE–

1. *"Intermittent, 0700 – 2200, Monday – Friday."*

2. *"Intermittent by NOTAM at least 4 hours in advance."*

21–2–5. CONTROLLING AGENCY

The ATC facility designated as the controlling agency (see paragraph 21–1–10).

NOTE–

A controlling agency is not designated for prohibited areas, alert areas, or controlled firing areas.

21–2–6. USING AGENCY

The agency, organization, or military command designated as the using agency (see paragraph 21–1–11).

21–2–7. SUA LEGAL DESCRIPTION AMENDMENTS

All changes to a published SUA legal description must be made through the appropriate regulatory or non–regulatory procedures described in this order. This includes minor changes, editorial corrections, internal subdivisions of an existing area, changes of the controlling or using agency, or reducing the area's dimensions or times of use.

TBL 21-2-1

EXAMPLES OF SPECIAL USE AIRSPACE LEGAL DESCRIPTIONS

REGULATORY SUA DESCRIPTION:

R-2305 Gila Bend, AZ

Boundaries - Beginning	at lat. 32°50'25"N., long. 112°49'03"W.; to lat. 32°50'52"N., long. 112°42'56"W.; to lat. 32°49'00"N., long. 112°39'03"W.; to lat. 32°29'00"N., long. 112°43'03"W.; to lat. 32°29'00"N., long. 112°53'33"W.; to the point of beginning.
Designated altitudes	Surface to FL 240.
Time of designation	0700-2300 local time daily, other times by NOTAM.
Controlling agency	FAA, Albuquerque ARTCC.
Using agency	U.S. Air Force, 58th Fighter Wing, Luke AFB, AZ.

NONREGULATORY SUA DESCRIPTION:

Taiban MOA, NM

Boundaries - Beginning	at lat. 34°34'36"N., long. 104°07'00"W.; to lat. 34°33'00"N., long. 103°55'02"W.; to lat. 34°10'00"N., long. 103°55'02"W.; to lat. 34°10'00"N., long. 104°07'00"W.; to the point of beginning.
Altitudes	500 feet AGL to but not including FL 180.
Times of use	0800-2400 Monday-Friday; other times by NOTAM.
Controlling agency	FAA, Albuquerque ARTCC.
Using agency	U.S. Air Force, Commander, 27th Fighter Wing, Cannon AFB, NM.

COORDINATE FORMAT - Do not round off latitude and longitude coordinates. Always use the full format consisting of degrees, minutes, and seconds, as follows:

Correct	**Incorrect**
40°06'00"N.	40°06'N.
104°35'30"W.	104°35.5'W.
39°00'00"N.	39°N.

Section 3. SUA Proposals

21–3–1. GENERAL

This section describes the requirements for SUA proposals submitted to the FAA. SUA proposals must be based on a specific airspace requirement. The need for the proposed airspace must be definitive and sufficient grounds must be provided to justify any resultant imposition on nonparticipating aircraft and/or to afford priority to the SUA user. Before proposing the establishment of new SUA, proponents shall consider the use of existing SUA, or the modification of an existing area, to conduct their mission.

21–3–2. CLASSIFIED INFORMATION

Do not include classified information in the proposal package. If any information required by this section is classified, the regional military representative should contact the service area office to discuss the handling of that information.

21–3–3. PROPOSAL CONTENT

SUA proposal packages shall contain the following information, as applicable:

a. Proponent's Transmittal Letter. Summarize the proposal and provide a point of contact for further information.

b. Area Description. Using the guidelines in Section 1 and Section 2 of this chapter, describe the proposed area as follows:

1. Title. State type of area (restricted area, warning area, etc.). For MOA proposals, include proposed name of the MOA.

2. Boundaries. A description of the proposed area's perimeter and any subdivisions (see paragraph 21–2–2).

NOTE–
All geographic coordinates shall be based on the current North American Datum (see paragraph 21-1-16).

3. Altitudes. State the floor and ceiling of the proposed area (see paragraph 21–2–3).

4. Times of use. State the times of use to be published for the area as determined in paragraph 21–2–4. Include an estimate of the expected area usage in number of hours per day and days per year. In cases where the unit plans to use the airspace during different blocks of time each day, but actual clock times may vary within the charted "times of use," describe those planned operations to provide as accurate a picture as possible of the projected daily use of the airspace.

5. Controlling agency. State the FAA or military ATC facility to be assigned as controlling agency for the proposed SUA.

NOTE–
A controlling agency is not designated for prohibited areas, alert areas, or controlled firing areas.

6. Using agency. State the organization to be designated as using agency for the airspace. Specify military service, unit or organization, and location. For non–military using agencies, specify the organization name and location.

c. Airspace Statement of Need and Justification.

1. Describe the purpose and need for the proposed airspace. Sufficient justification must be provided to support approval of the airspace. Additionally, any known or anticipated aeronautical impact on other airspace users must be addressed, including measures proposed, if any, to lessen the impact.

(a) For new SUA areas, explain why the requirement cannot be met by using existing SUA or by modifying an existing area. List SUA areas within a reasonable distance that were considered and explain why each area is not acceptable.

(b) For proposals to increase the dimensions or times of use of an existing area, explain the need for the increase.

2. State whether the area will be available for joint use. Provide justification for non–joint use areas.

d. Air Traffic Control Assigned Airspace (ATCAA). State whether or not an ATCAA will be requested to support the proposed SUA. If yes, describe ATCAA dimensions and times of use.

NOTE–
ATCAA information is requested in the proposal solely to assist the FAA in evaluating the overall aeronautical impact of the SUA proposal. Requests to establish an

ATCAA are coordinated directly with the ATC facility having jurisdiction over the airspace and are handled separately from the SUA proposal process.

e. Activities. List all activities to be conducted in the proposed SUA. Include the following information:

1. For areas that will contain aircraft operations:

(a) The number and types of aircraft that will normally use the area.

(b) A listing of the specific activities and the maximum altitudes required for each type of activity planned.

(c) State whether supersonic flight will be conducted.

(d) A chart depicting the location and the representative pattern of firing and/or ordnance delivery runs and weapons impact areas (if applicable).

2. For areas to contain surface-to-surface or surface-to-air weapons firing:

(a) Type weapon(s) to be fired.

(b) Maximum altitude required for each weapon listed.

(c) A chart of the proposed area depicting firing points, impact areas, firing fans and safety buffers for each type weapon used.

f. Environmental and land use information.

1. Furnish the name, organization, and mailing address of the person to whom comments on environmental and land use aspects of the proposal may be sent.

2. Proposals to establish SUA with a floor below 1200 feet AGL where there is underlying private or public use land, must include a statement that the proponent agrees to provide reasonable and timely aerial access to such land. Where applicable, describe provisions to be used to accommodate such access.

3. Proposals to designate the surface as the floor of a prohibited or restricted area shall include a statement explaining how the proponent will exercise control of the underlying surface (i.e., by ownership, lease, or agreement with the property owner). Do not submit a copy of the deed, lease, or control agreement.

NOTE-
Restricted areas that were designated with the surface as the floor prior to December 1, 1967, are exempt from the "own, lease, or control" requirement. The exemption status remains valid until amendment actions are taken which would expand the dimensions or times of use, or change the designated purpose of the area.

g. Communications and Radar.

1. If known, state whether radar and/or radio communications will be used to monitor the airspace. Identify the facility or agency that will provide radio and/or radar monitoring, e.g., range control, military radar unit (MRU), airborne radar unit (ARU), Fleet Area Control and Surveillance Facility (FACSFAC).

2. If a military ATC facility will be designated as the controlling agency for the airspace, indicate whether area status information and traffic advisories will be provided to nonparticipating pilots. If applicable, provide a VHF frequency to be depicted on aeronautical charts.

h. Safety Considerations. Include an explanation of the following items, if applicable:

1. Measures taken to ensure containment of the activity within the proposed area.

2. Procedures for handling malfunctions.

3. Ordnance trajectory envelopes.

4. When an aircraft activity could measurably affect the safety of persons or property on the surface, the proponent shall demonstrate that provisions have been made for their protection.

i. Coordination Summary. List ATC facilities, military units, and/or other organizations contacted in developing the proposal.

j. Area Chart. Submit an original sectional aeronautical chart depicting the boundaries of the proposed area and any subdivisions.

k. Environmental Documents. Unless provided separately, submit applicable environmental documents. If the environmental analysis is incomplete, indicate the status and estimated completion date.

l. Graphic Notice Information. For temporary MOA or temporary restricted area proposals, include the graphic notice information required by paragraph 21-1-15, above.

m. Other. Include any other information that should be considered by the FAA in making its determination on the proposal.

21–3–4. ABBREVIATED PROPOSALS

a. For certain SUA proposals, it is not necessary to include in the proposal package all of the items specified in paragraph 21–3–3, above. Proponents should consult with the service area office to determine if an abbreviated proposal may be submitted. Abbreviated proposals may be considered for:

1. Amendments of existing SUA to:

(a) Change the controlling or using agency.

(b) Reduce the dimensions or times of use.

(c) Subdivide or revoke the airspace.

(d) Make minor editorial corrections to the legal description.

2. Recurring proposals for temporary airspace (e.g., annual exercises such as Quick Force, Pecos Thunder, etc.) provided the location is the same and activities are similar to previous exercises.

3. Renewal of an existing CFA.

b. The service area office may specify the contents of the abbreviated proposal. Suggested items include, as applicable:

1. The type, purpose, and reason(s) for the action.

2. The specific changes to be made in the area's legal description.

3. For recurring temporary MOAs or CFAs, written confirmation that the activities, times, altitudes, safety precautions, etc., are to be the same as for a previously approved area.

4. The proposed effective date.

5. A summary of proposal coordination accomplished.

6. Environmental documentation, or written re–evaluation/updates of environmental documents used to support a previous temporary MOA.

7. For proposals to revoke SUA provide the reason for the action and requested effective date.

Section 4. Coordination of Proposals

21–4–1. POLICY

The regional military representatives are the service area office points of contact for the coordination of the respective military service's SUA proposals at the FAA regional/service area office level. The service area office will handle all coordination of nonmilitary SUA proposals.

21–4–2. PROPOSAL PRE–COORDINATION

a. Before submitting a SUA proposal to the FAA service area office, military proponents will coordinate, at a minimum, with locally affected ATC facilities and military units, local FAA representatives or liaison officers (where assigned), and the ARTCC having jurisdiction over the affected airspace.

b. Inquiries received from nonmilitary sources requesting the establishment or amendment of SUA will be referred to the appropriate service area office for assistance.

21–4–3. ATC FACILITY COORDINATION

a. The proponent will coordinate with affected ATC facilities as needed to discuss the proposal. Proponents should provide the facility with specific information about the mission requirement, desired airspace parameters, and why existing SUA within a reasonable distance are not suitable to accommodate the requirement (see paragraph 21–3–1).

b. The ATC facility will review the proposal to evaluate its potential impact on aeronautical and facility operations. Following its review, the facility will inform the proponent whether the proposed airspace is operationally feasible, would adversely impact aeronautical or facility operations, or if the location is not acceptable to the FAA for aeronautical reasons. The facility may suggest alternative locations or negotiate the design of the proposed SUA area to resolve or lessen any adverse impacts.

c. Proponents are cautioned that ATC facility concurrence with the proposal represents just the facility's preliminary assessment of the aeronautical and ATC operational feasibility of the proposal. The proposal will still be subject to the further processing requirements of this order (e.g., aeronautical study, public comment period, and environmental analysis), and the development of a letter of agreement. Therefore, the facility's concurrence shall not be interpreted as the FAA's endorsement or as a final approval of the proposal.

21–4–4. SUBMISSION OF PROPOSALS

a. Submit SUA proposals to the appropriate FAA service area office for formal processing. Military SUA proposals shall be submitted to the service area office through the appropriate military representative. Before submitting the proposal to the service area office, the military representative will review the package to determine compliance with the requirements of this order and applicable military service policies.

b. Proponents shall promptly notify the service area office if there is a change in requirements that would alter the requested effective date, or cancel the need for the proposed airspace.

Section 5. Regional/Service Area Office Actions

21–5–1. GENERAL

a. SUA proposals should be processed as expeditiously as possible, consistent with thorough analysis, public notice procedures, and environmental requirements. This is necessary to ensure that decisions are based on the most current data, and that limited funding and personnel resources are used efficiently. The proponent should receive a timely determination on the disposition of the proposal in order to conduct its mission or consider alternatives. Lengthy delays in processing the proposal may result in the need for a supplemental public comment period, and/or the revalidation of the aeronautical and environmental studies.

b. The service area office will notify the appropriate regional military representative, in writing, if a significant processing delay is anticipated or major problems arise.

21–5–2. REGIONAL/SERVICE AREA OFFICE PROCESSING REQUIREMENTS

This paragraph describes the basic SUA processing items accomplished at the regional/service area office level. The service area office may supplement or modify the sequence of these items as needed.

a. Assign a rulemaking docket number or nonrulemaking study number, as appropriate (see Chapter 2 of this order).

NOTE–
When amending any part of the legal description of an existing SUA area, a docket number, or study number must be assigned. This includes minor changes, editorial corrections, and the reduction or revocation of the airspace.

b. Review the proposal package for content and compliance with the requirements of this order.

c. Task concerned ATC facilities to conduct an aeronautical study of the proposal (see Section 6 of this chapter).

d. Determine if other airspace or airport actions are pending or on file at the region/service area office for possible conflict with the proposal.

e. Coordinate with other FAA offices (e.g., Airports, FPO, Flight Standards, etc.) as required for assistance in identifying impacts on airport development plans, aviation safety, and IFR/VFR operations.

f. Coordinate the proposal with adjacent regional office service area office, if necessary.

g. Circularize nonrulemaking proposals as specified in Chapter 2, and Chapter 21, Section 1 of this order. Send an information copy of each circular to Airspace and Rules.

h. For restricted area or prohibited area proposals, submit the proposal package to Airspace and Rules to initiate rulemaking action.

i. Determine if an informal airspace meeting will be held.

NOTE–
If informal airspace meetings or environmental public meetings are planned, and the schedule is known, include meeting information in the nonrulemaking circular, or in the rulemaking package for publication in the NPRM. Also, see meeting notification requirements in Chapter 2 of this order.

j. Review all public comments received. Evaluate comments with respect to the proposal's effect on the safe and efficient utilization of airspace. All substantive aeronautical comments must be addressed in the final rule or nonrulemaking case file. Where required, consider the proposal's impact on the safety of persons and property on the ground. Provide copies of pertinent public comments to the concerned regional military representative.

k. Review aeronautical study results.

l. Evaluate aeronautical impacts identified through public comments, aeronautical study, or other sources. Coordinate with the proponent regarding ways to lessen aeronautical impact and/or resolve problem areas. As additional impacts are identified during the processing of the proposal, provide the information to the proponent.

m. Review environmental or land-use comments addressed to the FAA, then forward them to the proponent for consideration in appropriate environmental documents.

n. If, after the publication of an NPRM or a non-rulemaking circular, the proposal is modified by the proponent or to mitigate aeronautical or environmental impacts, determine if the changes are significant enough to necessitate a supplemental public comment period.

o. Coordinate with the service area office Environmental Specialist for review of the proponent's environmental documents (see paragraph 21-5-4, below).

p. Determine whether to recommend FAA headquarters approval of the proposal, or disapprove the proposal at the regional/service area office level (see paragraphs 21-5-6 and 21-5-7, below).

21-5-3. AERONAUTICAL IMPACT CONSIDERATION

There is no set formula for balancing the various competing user requirements for the use of airspace. If approval of the SUA proposal would result in an adverse aeronautical impact, every effort shall be made to seek equitable solutions to resolve or minimize the adverse aeronautical effects. If the aeronautical impact cannot be mitigated, the service area office must carefully weigh the extent of that impact against the need and justification provided by the SUA proponent. The region's/service area office's recommendation should include a discussion of how any aeronautical issues were resolved.

21-5-4. ENVIRONMENTAL DOCUMENT REVIEW

In coordination with the service area office Environmental Specialist, the Airspace Specialist will review the proponent's draft and final environmental documents to ensure that the environmental analysis matches the proposed airspace parameters (e.g., time of use, lateral and vertical dimensions, types and numbers of operations, supersonic flight). Any environmental issues identified in this review must be forwarded to the proponent for consideration.

21-5-5. REGIONAL/SERVICE AREA OFFICE DETERMINATION

After considering all pertinent information, the service area office determines whether to recommend approval of the proposal to FAA Headquarters, negotiate changes with the proponent, or disapprove the proposal. If the regional/service area office aeronautical processing is completed before the proponent's environmental documents have been finalized, the proposal may be forwarded to FAA Headquarters for review of the aeronautical portion. In all cases, a final determination on the proposal by FAA Headquarters shall be deferred until applicable NEPA requirements are completed.

NOTE-
Supplemental public notice with an additional comment period may be necessary if significant changes are made to the proposal after it was advertised for public comment. If a FAA determination has not been issued within 36 months of the last aeronautical public comment period or, if it is known that the aeronautical conditions in the area have changed significantly from what existed at the time of that last comment period, a supplemental comment period is required. Supplemental comment periods may be reduced to 30 days in length.

21-5-6. DISAPPROVAL OF PROPOSALS

a. The service area office may disapprove any SUA proposal, however, such disapproval should be based on valid aeronautical reasons. The service area office shall notify the proponent, in writing, stating the reasons for disapproval. Reasonable efforts should be made to resolve problem areas before rejecting the proposal. Provide an information copy of the disapproval correspondence to Airspace and Rules.

b. If the proponent resubmits the proposal after resolving problem areas, the service area office should determine required actions and resume processing the proposal.

c. If the proponent resubmits the proposal without resolving problem areas, the service area office shall forward the case along with the region's recommendation to Airspace and Rules for further action.

21–5–7. SUBMISSION OF APPROVAL RECOMMENDATIONS TO FAA HEADQUARTERS

Submit SUA proposals recommended for approval to Airspace and Rules for final determination and processing. Include the following (as applicable):

a. A service area office transmittal memorandum containing a brief overview of the proposal and the region's/service area office's recommendation for headquarters action. Summarize any amendments made to the original proposal in response to public comments, or negotiations to mitigate impacts, etc. If coordination with the designated controlling agency indicates that plans exist to provide nonparticipating pilots with traffic advisories, or real–time area activity status information, provide a VHF frequency and facility identification to be depicted on aeronautical charts.

b. A separate attachment that contains the recommended legal description of the area (e.g., boundaries, altitudes, times, controlling agency, and using agency). Use the format shown in TBL 21–2–1.

NOTE–
If only part of the description of an existing area is being amended, the attachment should show just the changed information rather than the full legal description.

c. A sectional aeronautical chart depicting the final boundaries of the proposed area, including any subdivisions.

d. A copy of the proponent's airspace request correspondence and proposal package, to include all applicable items required by Section 3 of this chapter.

e. A copy of aeronautical comments received in response to the NPRM or non–rulemaking circular, along with a discussion of how each substantive comment was addressed or resolved.

f. A synopsis of FAA environmental issues or concerns which were forwarded to the proponent, if applicable. Identify any modifications made to the proposal to mitigate environmental effects.

g. A copy of the aeronautical study.

h. A summary of meeting discussions and copies of written comments submitted at the meeting, if an informal airspace meeting was held.

i. Copies of pertinent correspondence from other FAA offices (e.g., Flight Standards, Airports, adjacent service area office, affected ATC facilities, etc.).

j. Environmental documents (if not submitted separately).

k. Any other information that should be considered by FAA Headquarters in making a final determination on the proposal.

21–5–8. HANDLING OF PROPOSALS TO REDUCE OR REVOKE SUA

a. Normally, proposals which lessen the burden on the public by reducing the size, or times of use, or by revoking SUA, do not require advance public notice and comment. An abbreviated proposal package may be submitted in accordance with paragraph 21–3–4.

b. An environmental analysis of the SUA reduction or revocation action is not normally required. However, if FAA plans to implement new routes or air traffic procedures in the affected airspace, that route or procedural action may require its own environmental analysis.

21–5–9. FAA INITIATED SUA PROPOSALS

a. Proposals to establish or modify SUA are normally initiated by a DOD proponent. However, since it is responsible for ensuring the safe and efficient use of the navigable airspace, the FAA may initiate SUA proposals when such actions are necessary to resolve a safety issue, enhance joint use, or enhance the capability of the SUA to accommodate the using agency's mission. Prior to initiating a SUA proposal, the service area office shall exhaust every avenue to resolve the issues by other means. When modification of an existing SUA area is contemplated, full consideration shall be given to providing the affected user with an equivalent capability to perform its mission.

b. When initiating a proposal, the service area office will prepare the SUA proposal package and required documentation. The proposal will be coordinated with the affected military units through the appropriate regional military representative. If an environmental analysis is required, the service area office will determine responsibility assignment.

c. In developing a proposal, the service area office shall, through the regional military representative, consult with the concerned DOD department to identify and document the impact of the proposed change on affected military units' mission(s).

d. If any using agency objects and agreement cannot be reached, but there is strong justification to proceed with the proposal, the service area office shall send the proposal package to Airspace and Rules for further action. Include with the proposal package, the reason for the proposal, a copy of the objections, a summary of efforts to resolve the objections, and the region's recommendations. Do not initiate public notice procedures for such proposals, without Airspace and Rules concurrence.

Section 6. Aeronautical Study

21-6-1. PURPOSE

An aeronautical study is conducted to identify the impact of the SUA proposal on the safe and efficient use of airspace and ATC procedures.

21-6-2. POLICY

a. An aeronautical study is required for all prohibited area, restricted area, MOA, and warning area proposals, except those which reduce or revoke SUA, change the controlling or using agency, or make minor corrections to the legal description. The service area office determines whether to require an aeronautical study for alert area or CFA proposals.

b. The service area office shall task affected FAA ATC facilities to conduct, or provide input to the aeronautical study. When applicable, coordinate with adjacent regional/service area offices for additional input. FAA ATC facilities shall submit the completed study to the service area office. When input to the study from a military ATC facility is needed, the service area office shall submit a request to the appropriate regional military representative.

c. For temporary airspace actions that are recurring, such as periodic military exercises, a previous study may be used provided it has been reviewed for currency and updated as necessary.

d. The service area office will review the study to determine if there are any aeronautical impacts to be considered or resolved. The service area office will supplement the study as needed to include regional/service area office perspective, cumulative effect analysis, etc. Coordinate the study findings with the proponent to explore possible options to reduce aeronautical impact.

e. A copy of the study shall be included with the SUA proposal package submitted to FAA Headquarters.

21-6-3. CONTENT OF STUDY

The service area office may specify the content and format of the study based on the type and extent of the SUA proposal. Suggested items include:

a. Introduction. An overview of the existing airspace structure, airports, and types and volume of aeronautical activities currently operating in the airspace affected by the proposal.

b. Impact on IFR and VFR Terminal Operations. Consider the proposal's impact on existing and proposed terminal procedure.

1. Arrival and departure flows, STARs, and departure procedures.

2. Standard instrument approach procedures.

3. Airport traffic patterns, Class D, and Class E airspace surface areas.

c. Impact on public use and charted private airports (airports with FAA Form 5010 on file).

1. Number and types of aircraft based.

2. Amount of operations.

3. The proposal's affects on airport access, capacity, and operations.

d. Impact on IFR En Route Operations.

1. Overall effect on IFR traffic flow.

2. Existing airway/Jet Route structure/GPS routes.

3. Average daily traffic count on affected airway/route.

4. Feasibility of airway/route realignment to accommodate the proposed SUA.

5. Direct IFR routings.

e. Impact on VFR Operations, Routes, and Flyways. Consider the effect on VFR operations, charted routes and known, but uncharted, high-volume routes or flyways.

NOTE-
Although VFR pilots are not denied access to MOAs, the potential for aeronautical impact due to VFR pilots electing to deviate around the MOA when active should be evaluated when processing a MOA proposal. Consider the proposed MOA's size and location, and the extent of current non-participating VFR operations in the affected airspace.

f. Impact on other pending proposals. Consider known airport development plans, resectorization, other airspace or airway/route proposals, or instrument procedures, currently being processed or on file.

g. Cumulative Aeronautical Impact Assessment. Establishment of the proposed airspace may have broader effects beyond the immediate vicinity of the proposed airspace. Consider the overall impact of the proposal on aviation operations when combined with:

1. Existing adjacent airspace such as Class B or C areas, or other SUA.

2. Existing geographical features such as large bodies of water, mountainous terrain, or obstructions that could influence the flight paths of nonparticipating aircraft or affect the availability of nonparticipating aircraft to circumnavigate the proposed SUA.

3. Aviation safety issues, compression of air traffic, etc.

NOTE-
If the proposed SUA will contain aircraft operations, also consider the impact of routes to be used by the participating aircraft to enter/exit the SUA area.

h. Associated ATCAA. If it is known that an ATCAA will be requested in conjunction with the proposed SUA, determine if use of the ATCAA would result in any additional aeronautical impact that should be considered.

i. Alternatives. When adverse aeronautical impacts are identified consider measures or alternatives that could mitigate or lessen the impact.

j. ATC Facility Assessment. The ATC facility's assessment of a proposal's impact on aeronautical and facility operations, and the facility's concurrence or nonconcurrence with the proposal.

k. ATC services. Indicate whether the controlling agency plans to provide real-time SUA status information, allow transitions through the area by nonparticipating aircraft, or provide traffic advisories to nonparticipating pilots requesting such services. If the controlling agency agrees to advertise such service, provide facility identification and a VHF frequency to be depicted on aeronautical charts.

l. Recommendations. Provide a recommendation for FAA action on the proposal.

Section 7. Restricted Area and MOA Annual Utilization Reports

21-7-1. PURPOSE

Annual utilization reports provide the FAA with information regarding the times and altitudes used, and the types of activities conducted in restricted areas and MOAs. These reports assist the FAA in its management of the SUA program.

21-7-2. REPORTING REQUIREMENTS

a. Using agencies are required to submit annual reports to the FAA detailing the use of all assigned restricted areas and/or MOAs. Actual utilization data are required. See FIG 21-7-1 for report format. Instructions for preparing the report are contained in FIG 21-7-2.

b. Reports shall cover each fiscal year period (October 1 through September 30). If the area was assigned to the using agency for only part of the fiscal year, report the utilization for that partial period.

c. For areas that are subdivided by legal description, a separate report is required for each officially designated sub-area published in FAAO JO 7400.8, Special Use Airspace.

d. Do not include classified information in the report.

e. Submit reports by January 31 following the end of each fiscal year, to the office of the service area office director having jurisdiction over the airspace being reported.

f. Military using agencies shall submit reports to the FAA through the appropriate regional military representative. The military representative will ensure that an information copy of each report is sent to the Director of System Operations Airspace and AIM, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591.

g. Non-military using agencies shall submit reports directly to the FAA service area office director. The service area office will send an information copy of nonmilitary reports to Airspace and Rules.

21-7-3. SUPPLEMENTARY REPORTS

The service area office may request the using agency to submit a supplementary report if it determines that additional information is needed to evaluate the use of a restricted area or MOA. Requests will be submitted through the appropriate regional military representative. Using agencies should provide the requested information within 60 days of receiving the request.

21-7-4. UTILIZATION REPORT TERMS

Terms as used in Restricted Area and MOA Annual Utilization Reports are defined as follows:

a. ATCAA. Airspace assigned by ATC to segregate air traffic between the specified activities being conducted within the assigned airspace and other IFR traffic.

b. Activated. The time-period during which the controlling agency has returned the restricted area or MOA to the using agency; regardless of whether any activity is actually occurring.

c. Controlling Agency. The designated ATC facility having jurisdiction over the SUA airspace when it is not in use by the using agency. Also, the facility that authorizes transit through, or flight within, special use airspace, in accordance with joint-use procedures contained in a letter of agreement.

d. Joint Use. A term applied to SUA which is released to the controlling agency for public access during periods when the airspace is not needed by the using agency. It also means airspace wherein access may be granted to non-participating aircraft subject to the joint-use procedures specified in a letter of agreement between the controlling and using agencies.

e. Nonparticipating aircraft. An aircraft, civil or military, which is not a part of the activities being conducted within a SUA area.

f. Scheduled. The using agency's planned time period(s) of intended use of a SUA area as submitted in advance to the controlling agency (for military using agencies, see the scheduling requirements

contained in FAAO JO 7610.4, Chapter 9, Military Operations Requirements).

g. Using agency – The organization, unit, or military command that the SUA was established; and the agency responsible for compilation and submission of Restricted Area/MOA Annual Utilization Reports.

h. Utilized – Amount of time (hours or days) that activities were actually conducted in the SUA area (e.g., when participating aircraft were operating, or other designated activities were conducted, in the airspace).

21–7–5. REVIEW REQUIREMENT

a. The service area office shall perform a thorough review of all annual utilization reports for restricted areas and MOAs within its jurisdiction. At a minimum, the following utilization report items should be analyzed:

1. Activities. Are the reported activities appropriate for the airspace type and designated purpose?

2. Altitudes. Do the reported activities and altitudes reflect a requirement for the altitudes published in the area's legal description?

3. Utilization Data. Consider whether actual use supports the published parameters, or if discussions should be held with the user to determine if an airspace amendment action is appropriate. Calculate the following percentages for reference in comparing the published parameters of the area with its reported actual utilization.

(a) Hours actually utilized as a percentage of hours activated.

(b) Hours scheduled as a percentage of hours published in the area's legal description.

(c) Hours activated as a percentage of hours scheduled.

(d) Days actually utilized as a percentage of days activated.

4. Joint Use Information. Is the airspace being made available for joint use (if applicable)?

5. Remarks. Consider any mitigating factors that explain or clarify reported data. Are any other issues identified that require further action?

b. If additional information is needed to complete the utilization report review, request the user to submit a supplementary report as described in paragraph 21–7–3.

c. As required, initiate discussions to resolve issues or forward recommendations for corrective action, to the regional military representative or responsible official for nonmilitary SUA.

d. Refer to Section 8 of this chapter for additional information regarding SUA review procedures and utilization standards.

21–7–6. REVIEW SUMMARY

The service area office shall prepare a summary of the results of its annual utilization report review. The summary should document the findings, recommendations, and actions taken, as appropriate. Submit review summaries to Airspace and Rules by March 31 of each year. It is not necessary to submit copies of the actual utilization reports with the summary.

FIG 21-7-1

RESTRICTED AREA AND MILITARY OPERATIONS AREA ANNUAL UTILIZATION REPORT (RCS: 1412-DOT-AN)

1. Restricted area number or MOA name:
2. Reporting period dates:
3. Reporting Unit Name and Phone:
4. Associated ATCAA:
(a) ATCAA Name:
(b) ATCAA Altitudes:
5. Aircraft Activities:
(a) Aircraft types:
(b) Types of activities conducted:
(c) Altitude/flight levels used for each type of activity:
(d) Supersonic flight:
(1) Area used for supersonic:
(2) Altitudes/flight levels:
6. Artillery/Mortar/Missile Activities (Restricted Area only):
(a) Type activities:
(b) Maximum altitude used for each activity:
7. Other activities not reported in 5 or 6 above:
(a) Type activity:
(b) Maximum altitude used for each activity:
8. Utilization information:
(a) Total number of aircraft sorties:
(b) Total number of days the area was:
(1) Scheduled for use:
(2) Activated:
(3) Actually utilized:
(c) Total number of hours the area was:
(1) Scheduled for use:
(2) Activated:
(3) Actually utilized:
9. Joint use information:
(a) Total number of hours the area was returned to the controlling agency:
(b) Letter of agreement provisions:
10. New chart Submitted/No Change:
11. Remarks:

FIG 21-7-2

INSTRUCTIONS FOR PREPARING RESTRICTED AREA AND MOA ANNUAL UTILIZATION REPORTS

GENERAL: Restricted Area and MOA annual utilization reports provide information needed by FAA airspace managers to confirm airspace requirements and evaluate the efficiency of airspace utilization. It is essential that this report document actual utilization of the airspace as completely and as accurately as possible. The following format is used to report both restricted area and MOA utilization. If an item does not apply, enter "N/A" for that item. A "Remarks" section is provided to document additional pertinent information. Do not include classified information in this report. Refer to FAAO JO 7400.2, Procedures for Handling Airspace Matters, for definitions of terms used in this report, and for additional reporting and submission instructions.

REPORT FORMAT:

1. Restricted area number or MOA name: State the Restricted Area number or MOA name. Report only one area per form. For areas that are officially subdivided by legal description (See FAAO JO 7400.8), prepare a separate report for each subdivision.

2. Reporting Period Dates: Enter the fiscal year dates (1 Oct [enter applicable fiscal year] to 30 Sept [enter applicable fiscal year]), or period covered if other than a full fiscal year.

3. Reporting Unit: Provide name of organization preparing the report and DSN, commercial and FAX numbers (as available).

4. Associated ATCAA:

(a) ATCAA Name: Name(s) of ATCAA established for use in conjunction with the area being reported in Item 1. Enter "None" if no ATCAA established.

(b) ATCAA Altitudes: State the ATCAA altitudes available.

5. Aircraft Activities:

(a) Aircraft types: List the specific types of aircraft, which used the area during the reporting period (e.g., F-15, B-1, etc.). Include ROA activities in this section.

(b) Types of activities conducted: List each specific type of activity conducted. Do not use general terms such as "air operations," etc.

(c) Altitudes/flight levels used for each type activity: State the highest altitude/flight level used for each activity listed in 5.(b), above.

(d) Supersonic flight:

(1) Area used for supersonic: Indicate yes/no.

(2) Altitudes/Flight levels: State altitudes/flight levels used for supersonic flight.

6. Artillery/Mortar/Missile Activities (Restricted Areas only):

(a) Type of activities: Indicate type(s) of weapon(s) fired.

(b) Maximum altitude used for each activity: State the highest altitude used for each activity/weapon.

7. Other activities not reported in 5 or 6 above:

(a) Type activity: List any other activities conducted in the area, but not already covered in other sections of the report.

(b) Maximum altitude for each activity: State highest altitude used for each type activity.

8. Utilization information:

(a) Total number of aircraft sorties: Enter the total number of aircraft sorties that utilized the area during the reporting period.

(b) Total number of DAYS the area was: Count a "day" as being scheduled, activated, or utilized, regardless of the amount of time involved on that particular day. The intent of this item is to document the number of different days during the year that the area was needed in order to accomplish the mission, whether it was needed for only 10 minutes or a full 24 hours.

(1) Scheduled for use:

(2) Activated:

(3) Actually utilized:

(c) Total number of HOURS area was:

(1) Scheduled for use: Hours the area was activated by NOTAM may be included in this item.

(2) Activated:

(3) Actually utilized: When computing "actually utilized" time, do not provide a cumulative total of individual aircraft hours flown in the area. Hours reported cannot exceed the area's total available published hours.

9. Joint use information:

(a) Total number of hours the area was returned to the controlling agency: To compute this figure, subtract the hours reported in 8(c)(2) from 8760 hours (use 8784 hours for "leap year" reporting).

(b) Letter of agreement provisions: Note whether the letter of agreement between the controlling agency and the using agency includes any joint-use provisions which permit the controlling agency to route nonparticipating aircraft through the airspace.

10. New chart Submitted/No Change: Attach a chart of the area depicting, as applicable, aircraft operating areas, flight patterns, ordnance delivery areas, surface firing points, and target, fan, and impact areas. After once submitting an appropriate chart, annual charts are not required unless there is a change in the area, activity, or altitudes used, which would alter the depiction of the activities originally reported. If no change is to be submitted, indicate "No change."

11. Remarks: Include any other information that should be considered by airspace reviewers. Explain reasons for apparent low utilization rates or large differences between "scheduled," "activated," and/or "utilized" data (e.g., extensive weather or maintenance cancellations and delays, unit deployments, etc.); or note recurring airspace denials or restrictions on use of the area imposed by the controlling agency.

Section 8. SUA Review and Analysis

21–8–1. GENERAL

Under Title 49 U.S.C. 40101 the FAA is charged with ensuring the safe and efficient use of the nation's airspace. In carrying out this responsibility, the FAA must periodically review existing SUA and take appropriate airspace amendment action, if warranted, based on the findings of its review. The following paragraphs set forth SUA review policy and provide suggested analysis techniques for use by regional and headquarters airspace personnel.

21–8–2. POLICY

a. The service area office shall conduct an annual review of restricted areas, MOAs, and warning areas under its jurisdiction. CFAs and Alert Areas may be reviewed as deemed necessary by the service area office. The purpose of the annual review is to:

1. Confirm that the user has a continuing requirement for the airspace.

2. Determine if the airspace is being used for its designated purpose.

3. Determine if actual use supports the designated dimensions and times of use.

4. Determine if joint–use airspace is being released to the controlling agency when not needed for its designated purpose.

5. Determine if any adjustments should be considered to enhance the efficient use or management of the airspace.

b. When the review indicates that airspace amendment or other corrective action should be considered, the service area office shall discuss the findings with the respective regional military representative, or responsible official for non–military SUA, and determine an appropriate course of action.

21–8–3. SOURCES OF INFORMATION

There are a variety of sources of information pertinent to SUA utilization. Using agencies are required to submit annual reports on restricted areas and MOA utilization as described in Section 7 of this chapter. Additional information may be obtained through coordination and research to augment these reports or to compile specific information about SUA areas that are not covered by the annual reporting requirement. Coordination with controlling agencies may be necessary to obtain detailed information regarding real–time use and area scheduling practices, or to identify airspace operational problems. The Special Use Airspace Management System (SAMS) will provide a more centralized and comprehensive source of SUA data for review purposes. As it becomes available, SAMS data should be incorporated into the review process. Additional sources of SUA information include:

a. Controlling agency or using agency input.

b. Regional/service area office SUA onsite review team reports.

c. FAA Air Traffic Representative (ATREP) reports.

d. SUA Letters of Agreement.

e. User meeting feedback.

f. Routine use of restrictions imposed by the controlling agency on the activation of SUA, or frequent denials of using agency activation requests.

g. Recurring ATC problems, spill outs, or NMAC reports associated with the SUA being reviewed.

21–8–4. UTILIZATION STANDARDS

a. The General Accounting Office (GAO) recommended that the FAA establish standards to be used to measure the effectiveness of SUA utilization, and to serve as a starting point for regional/service area office discussions with the user about the possible need for an airspace amendment or revocation action. In fulfillment of the GAO recommendation, this paragraph presents a limited, basic standard to be considered when reviewing SUA utilization data. It applies primarily to the review of restricted area and MOA annual utilization reports, but may be used to evaluate other SUA areas where sufficient utilization data is available.

b. Reviewers are cautioned that many factors affecting SUA use cannot be quantified. Therefore, it is impractical to develop an all–encompassing

standard that would fully measure SUA effectiveness. A thorough evaluation of SUA will require a combination of utilization data analysis, plus a subjective review of each area with consideration given to any unique circumstances.

c. The following standard may be applied in reviewing SUA utilization data:

1. Activities. The activities conducted must be appropriate for the type and designated purpose of the SUA.

2. Times of Use. Hours actually utilized should equal at least 75 percent of the hours the area was activated, discounted for weather cancellations and delays, or loss of use for reasons beyond the using agency's control (as documented in the utilization report Remarks section).

3. Designated Altitudes. Activities conducted/altitudes used indicate a need for retaining the published altitude structure of the SUA area.

21-8-5. SUA REVIEW GUIDE

This paragraph may be used as a framework for conducting a review of SUA. It applies primarily to the review of restricted areas and MOAs for which annual reports are submitted. However, it may also be used for reviewing warning areas when sufficient utilization data are available. This should not be considered an all-inclusive list. Reviewers may modify the factors to be examined or the extent of the review based on the availability of information or to fit the specific area/situation under review. The following items should be evaluated:

a. Activities. Are the activities conducted appropriate for the type and purpose of the SUA area? If inappropriate activities are conducted, notify the military representative, or responsible official, that the activity must be terminated in that SUA area or an airspace proposal must be submitted to establish the proper category of SUA to accommodate the activity.

b. Altitudes. Does the actual use of altitudes support those specified in the descriptions? Are there less frequently used portions that could be subdivided as separate areas to enhance real-time joint use of the airspace? Are any portions of the vertical dimensions no longer required for the mission? If the answers indicate a need for change, action should be initiated to amend the description.

c. Times of Use. Compare scheduled, activated, and actual utilized data. Low usage rates do not necessarily indicate a need to revoke or amend airspace. Consideration must be given to the designated purpose of the area and whether limitations were imposed on its use as a condition for the original establishment of the SUA. SUA may be established to accommodate less frequent activities such as certain research, test, and development profiles. Determining the continued requirement for, or validity of, such areas will require discussions with the user and cannot be determined strictly based on utilization times. Additionally, low or infrequent use may result from factors beyond the using agency's control, such as adverse weather, unit deployments, maintenance delays, ATC-imposed restrictions, etc.

1. Compare time actually utilized to time activated. This is the most important factor in analyzing SUA utilization. Significant disparity between the time activated and actually utilized may indicate inefficient airspace use and the need to improve real-time use procedures so that the airspace is released to the controlling agency for joint use when not needed by the user for its designated purpose. Determine whether the published times of use are valid or should be amended to match current mission requirements. If actual utilization is less than 75 percent of the time activated, coordinate with the regional military representative to determine the reason and whether corrective action is required. If information is available, the impact of weather and/or ATC delays on the actual utilization of the area should be considered when evaluating this item.

2. Compare scheduled use to published times of use. If scheduled use is significantly less than or greater than (e.g., by use of NOTAMs) the published times, discussions should be held with the user to determine if the published times should be amended to reflect current mission requirements.

3. Compare scheduled time to activated time. Is the amount of time the area is being activated consistent with the amount of scheduled use? A significant difference between these times may indicate a need to discuss real-time use or revalidate published times of use with the user. Consideration

should be given to the effects of weather or maintenance cancellations, or other factors limiting the using agency's use of the area.

4. NOTAM Activation. If a NOTAM provision is included in the SUA legal description, and activation by NOTAM is extensive or routine, consider whether it would be advantageous to increase the published times of use to include the routine NOTAM period. This action may better inform the flying public of expected area usage periods, and reduce NOTAM system workload.

5. Intermittent Time of Use. If regular use of the area occurs during a set time period daily, or if use has become other than sporadic, consider whether specific times of use should be published to better inform the flying public of expected area usage periods and reflect current mission requirements.

d. Non-utilization of SUA. A using agency is required to explain in the remarks section of its annual utilization report why it did not use the SUA area during an entire reporting period. If no such explanation is provided, request that the military representative or using agency provide the reasons and the using agency's plans for future use of the airspace.

1. If the user responds that the SUA is no longer required, initiate action to revoke the airspace.

2. If the user validates a continuing need for the airspace, coordinate with the user to determine if the area's dimensions and/or times of use remain valid or should be amended to reflect current requirements.

3. If the airspace remains unused for a second consecutive fiscal year period, inform the military representative of the FAA's intent to revoke the area unless additional justification for retaining the airspace is submitted.

e. Joint-use and Real-time Use Procedures. Evaluate the effectiveness of joint-use procedures and real-time activation/deactivation procedures (if applicable). Obtain input from the controlling agency as needed.

1. Are procedures for timely release of joint-use airspace contained in a letter of agreement?

2. Are real-time activation/deactivation procedures specified and used?

f. Area Scheduling. Does the using agency schedule the area in accordance with FAAO JO 7610.4, Special Operations, requirements?

g. Aeronautical Charts and Publications. Check the accuracy of SUA information shown on aeronautical charts and contained in applicable publications. Submit required corrections to Airspace and Rules for processing.

h. Other Issues. Determine if there are any other issues that require further investigation, such as:

1. Adverse impact on NAS operations.

2. Recurring spill outs.

3. Frequent instances of limitations on the use or activation of the SUA by the controlling agency.

21-8-6. SUA REVIEW FOLLOW UP ACTION

The service area office's annual SUA review forms the basis for further discussions with user representatives to resolve any discrepancies noted or other issues that were identified. Results of the review should be documented and maintained on file in accordance with current administrative guidance. Regional/service area office follow up actions are dependent on the results of the review as follows:

a. If it is determined that the existing SUA parameters (times, altitudes, boundaries) are valid, no further action is required other than documentation of the review results.

b. If any SUA parameters are found to exceed the user's requirements or if it is determined that the SUA does not accommodate the user's current mission requirements, then the service area office should discuss the finding with the military representative/using agency official. When appropriate, the service area office should request the user to submit an airspace proposal to amend the SUA description.

Section 9. SUA Review Teams

21-9-1. PURPOSE

a. A SUA Review Team is one option available to the service area office director for conducting the annual SUA review detailed in paragraph 21-8-2.

b. When this option is selected, the SUA Review Team shall:

1. Evaluate the need for, or obtain additional information regarding a specific SUA proposal; or

2. Develop recommendations for the retention, modification, or revocation of the SUA airspace based on actual utilization or a change in user requirements.

c. A team established for this type of review shall be dissolved upon completion of its overall conduct of the review.

21-9-2. TEAM COMPOSITION

Review teams shall be composed of at least two FAA members plus the regional military representative. The team membership shall be based on the requirements and purpose of the review. Members may be selected from the reviewing region/service area office, another service area office, concerned ATC facilities, or other FAA Headquarters (e.g., Strategic Operations Security or Safety Evaluations representative), regional, orfield offices, as required (e.g., Flight Standards or FPO).

21-9-3. RESPONSIBILITIES

a. When the service area office director determines that there is a need for a team to review a SUA, the service area office director shall designate a team chairperson who will be responsible for the overall conduct of the review.

b. The team chairperson shall:

1. Prepare an agenda and pre-brief team members on the purpose and procedures for the review.

2. Begin coordination sufficiently in advance to provide local officials with adequate time to prepare the required information.

3. Coordinate visits to military SUA sites through the appropriate regional military representative.

4. Determine if an informal airspace meeting should be held to allow users and other interested parties an opportunity to present comments and offer recommendations. If a meeting is planned, follow the informal airspace meeting procedures in Chapter 2 of this order.

c. The team shall examine:

1. The actual hours, altitudes, and geographical area used, the types of activities conducted, and the impact on other users.

2. Review the effectiveness of procedures for real-time, joint-use of the airspace, and identify problem areas or aeronautical impacts.

3. Draft recommendations to resolve problems, improve the efficient use of airspace, and/or enhance the service to the using agency.

21-9-4. TEAM REPORT

a. A report shall be prepared to document the results of the review. The report contents should include at a minimum:

1. Copies of notification memoranda.

2. A team member list.

3. An Executive Summary.

4. A description and chart of the SUA reviewed.

5. Team Observations and Recommendations.

6. An informal airspace meeting summary and copies of written comments submitted at the meeting (if applicable).

7. Supporting documents or source information (if applicable).

(a) SUA utilization data.

(b) Letters of Agreement.

(c) Other pertinent documents.

b. Within 60 days after completion of the review, the report shall be forwarded through the service area office director to the regional military representative,

or responsible official for nonmilitary SUA. A copy of the report shall be sent to Airspace and Rules and concerned ATC facilities.

21–9–5. FOLLOW UP ACTION

a. The regional military representative, or responsible official for non–military SUA, should respond to the report in writing within 60 days of receipt. If the user concurs with the team's observations and recommendations, the service area office shall coordinate with the user representative to initiate any required airspace action or other recommendations.

b. If the user does not agree with the stipulated recommendations, the service area office shall coordinate with the appropriate representative to resolve any issue(s). If agreement cannot be reached, the service area office shall forward its recommendation, along with an explanation of the user's position, to Airspace and Rules for further action. A copy of the region's/service area office's recommendation shall be provided to the appropriate user representative.

c. The service area office will monitor the status of open items until all required actions have been addressed.

Chapter 22. Prohibited Areas

Section 1. General

22–1–1. DEFINITION

A prohibited area is airspace established under 14 CFR part 73 provisions, within which no person may operate an aircraft without permission of the using agency.

22–1–2. PURPOSE

Prohibited areas are established when necessary to prohibit flight over an area on the surface in the interest of national security and welfare.

22–1–3. IDENTIFICATION

Identify prohibited areas with the prefix letter "P" followed by a dash, a two–digit number, location, and the two–letter state abbreviation (e.g., "P–47, Amarillo, TX"). Identification numbers are assigned by Airspace and Rules.

22–1–4. DESCRIPTION

Prohibited areas normally extend from the surface upward to a specified altitude, with a "continuous" time of designation

22–1–5. WAIVERS/AUTHORIZATION

No person may conduct operations within a prohibited area except under a certificate of waiver issued by the Administrator.

Section 2. Processing

22–2–1. SUBMISSION OF PROPOSALS

a. Submit prohibited area proposals to the service area office for processing in accordance with the requirements in Chapter 21 of this order. Although specifying a minimum processing time is impractical, at least 6 months would be needed for a routine, non–controversial proposal.

b. The restrictions imposed by a prohibited area may be highly controversial and require in–depth study as well as strong justification.

22–2–2. REGIONAL/SERVICE AREA OFFICE ACTIONS

After completing the requirements of Chapter 21, prohibited area proposals shall be forwarded to Airspace and Rules for final determination.

Chapter 23. Restricted Areas

Section 1. General

23–1–1. DEFINITION

A restricted area is airspace established under 14 CFR part 73 provisions, within which the flight of aircraft, while not wholly prohibited, is subject to restriction.

23–1–2. PURPOSE

Restricted areas are established when determined necessary to confine or segregate activities considered hazardous to nonparticipating aircraft.

23–1–3. IDENTIFICATION

Identify restricted areas with the letter "R" prefix followed by a dash, a four–digit number, a location, and the two–letter state abbreviation (e.g., R–2309, Yuma, AZ). A letter suffix is used to indicate area subdivisions. Airspace and Rules assigns identification numbers.

23–1–4. RESTRICTED AREA FLOOR

a. The restricted area floor may be established to the surface only when the using agency owns, leases, or by agreement, controls the underlying surface.

NOTE–
Existing restricted areas established from the surface before December 1, 1967, are exempt from the "own, lease, or control" requirement. This remains valid until amendment action is taken which would expand the boundaries, altitudes, or times of use, or changes the designated purpose of the area. Nevertheless, using agencies of such restricted areas are encouraged to acquire sufficient control of the property to prevent possible disruption of that agency's activities.

b. Provisions must be made for aerial access to private and public use land beneath the restricted area, and to accommodate instrument arrivals/departures at affected airports with minimum delay.

c. The restricted area shall exclude the airspace 1,500 feet AGL and below within a 3 NM radius of airports available for public use. This exclusion may be increased if necessary based on unique circumstances.

23–1–5. JOINT USE

a. Restricted areas are established for joint use by assigning an ATC facility as the controlling agency, and by executing a joint use letter of procedure between the controlling and using agencies. The letter of procedure provides for the operation of nonparticipating IFR and/or VFR aircraft within the area. Flight within the restricted area is controlled by the using agency except when the area has been released to the controlling agency. During such periods, the controlling agency may permit nonparticipating aircraft operations in the restricted area.

b. Prepare letters of procedure in accordance with FAAO JO 7210.3, Facility Operation and Administration. The format of the letter may be modified as needed based on local requirements. The joint–use letter shall include procedures for the timely activation, release, or recall of the airspace. The letter may also specify conditions and procedures whereby the controlling agency may route traffic through the area while in use, if approved separation can be maintained between nonparticipating aircraft and the user's activities.

c. The service area office shall be the approval authority for joint–use letters of procedure. This authority may be delegated to a FAA ATC facility designated as the controlling agency.

d. Requirements for coordination and communications between the controlling and using agencies concerning the activation and release of joint–use restricted areas shall be outlined in the letter of procedure. A record shall be made of all such communications. These records shall be retained in accordance with FAAO JO 7210.3, Facility Operation and Administration.

23–1–6. TEMPORARY RESTRICTED AREAS

a. Temporary restricted areas may be designated when necessary to accommodate hazardous activities associated with military exercises, test programs, etc.

b. Proponents shall be encouraged to seek permission from using agencies to conduct their activities within existing permanent restricted areas before submitting a request for designation of a temporary restricted area.

c. The duration of a temporary restricted area shall be specified in the NPRM/Final Rule.

Section 2. Processing

23–2–1. SUBMISSION OF PROPOSALS

Submit restricted area proposals to the service area office at least 10 months prior to the desired effective date. The following schedule is an estimate of the minimum time needed to process proposals that require only routine coordination.

NOTE–
Proposals that are complex, controversial, or require extensive environmental analysis could need up to 24 months or more additional processing time beyond that shown in TBL 23–2–1.

TBL 23–2–1

Calendar Days	Action
D	Proposal received by FAA regional/ service area office.
D+30	Proposal reviewed by region/ service area office; aeronautical study initiated. Proposal sent to Airspace and Rules to begin Rulemaking Process.
D+95	Proposal reviewed by Airspace and Rules.
D+105	NPRM published in Federal Register; Public comments directed to appropriate region.
D+150	Public comment period ends.
D+180	Comments reviewed by the region/ service area office, and recommendations sent to Airspace and Rules.
D+240	Headquarters review of proposal, comments, and regional/service area office recommendations. Final determination; Rule prepared and submitted to Federal Register.
D+250	Rule published in Federal Register (at least 30 days prior to effective date).
D+250–306	Within this time frame; NACO cutoff date, and Rule effective date.

23–2–2. TEMPORARY RESTRICTED AREA PROPOSALS

a. Temporary restricted areas are subject to the same rulemaking processing (e.g., NPRM and final rule) and environmental analysis requirements as permanent areas. However, since temporary restricted area effective dates are determined by the exercise or mission requirements rather than the standard 56–day en route chart cycle, a shorter overall processing time is the norm.

b. The FAA will attempt to accommodate changes in temporary restricted area requirements. Nonetheless, exercise planners should be aware that the Administrative Procedure Act requires public notice of the proposal and publication of the final rule at least 30 days before the airspace effective date. Moreover, these requirements may not permit late changes to the airspace proposed in the NPRM without causing a delay in the planned exercise start date. Significant changes to the proposal after the NPRM is published could necessitate an additional public comment period, further study of the aeronautical impact, and/or supplemental environmental analysis. Therefore, early planning, careful ground site selection, and close coordination between concerned parties throughout the entire planning process are essential. In selecting the ground site, specific attention must be given to the impact of the proposed temporary restricted area on existing aeronautical operations near the site. In any case, no change should be made within 45 days of the exercise start date unless:

1. It is absolutely essential to the safety and successful conduct of the exercise; or

2. To reduce the amount of airspace to be restricted.

NOTE–
For processing times, see TBL 23–2–2. See FAAO JO 7610.4, chapter 2, Exercise Planning, for additional details.

TBL 23-2-2

Calendar Days	Action
D	Proposal received by FAA regional/ service area office.
D+30	Proposal reviewed by region/service area office and submitted to Airspace and Rules; aeronautical study initiated as required.
D+95	Proposal received by Airspace and Rules, NACO coordination; NPRM sent to Federal Register. Comments directed to appropriate regional/ service area office.
D+105	NPRM published in Federal Register.
D+150	Public comment period ends.
D+180	Comments reviewed by region/ service area office; recommendation sent to Airspace and Rules.
D+240	Airspace and Rules review of proposal, comments, and regional/ service area office recommendation. Final determination. Rule prepared and sent to Federal Register. Graphic Notice sent to NOTAM Publication.
D+250	Rule published in Federal Register (at least 30 days prior to effective date).

Chapter 24. Warning Areas

Section 1. General

24–1–1. DEFINITION

A warning area is airspace of defined dimensions, (extending from 3 NM outward from the coast of the United States), designated to contain activity that may be hazardous to nonparticipating aircraft.

24–1–2. PURPOSE

The purpose of a warning area is to warn nonparticipating pilots of the potential danger from activities being conducted. A warning area may be located over domestic waters, international waters, or both.

24–1–3. IDENTIFICATION

Identify warning areas with the letter "W" prefix followed by a dash; a two- or three-digit number; a location; and the two-letter state abbreviation (e.g., W-291, San Diego, CA). A letter suffix is used to indicate subdivisions. Identification numbers are assigned by Airspace and Rules.

24–1–4. JOINT USE

Warning areas may be considered for joint use if the area can be released to the FAA during periods when it is not required for its designated purpose, and provided the warning area is located in airspace wherein the FAA exercises ATC authority under ICAO agreements. When designating a warning area for joint use, a letter of agreement shall be executed between the controlling and using agencies to define the conditions and procedures under which the controlling agency may authorize nonparticipating aircraft to transit, or operate within the area. Apply the provisions of paragraph 23–1–5, as appropriate.

Section 2. Processing

24–2–1. SUBMISSION OF PROPOSALS

Submit warning area proposals to the service area office at least 7 months prior to the desired effective date. The following schedule is an estimate of the minimum time needed to process proposals that require only routine coordination.

NOTE–
Proposals that are complex or controversial could require significantly longer processing time than that shown in TBL 24–2–1.

TBL 24–2–1

Calendar Days	Action
D	Proposal received by FAA regional/ service area office.
D+30	Proposal reviewed by region/service area office; aeronautical study initiated, as required Nonrule circular published.
D+75	Public comment period ends. Aeronautical study due.
D+105	Comments reviewed by region/ service area office; recommendation sent to Airspace and Rules.
D+150	Executive Order 10854, NACO coordination, and final determination by Airspace and Rules.
D+160	NACO cutoff date. Warning area published in NFDD (on or before cutoff date for next available charting date).
D+240	Warning area effective date.

24–2–2. EXECUTIVE ORDER 10854 COORDINATION

In accordance with Executive Order 10854, all warning area proposals must be coordinated with the Departments of State and Defense. This coordination will be accomplished by Airspace and Rules.

Chapter 25. Military Operations Areas

Section 1. General

25–1–1. DEFINITION

A military operations area (MOA) is airspace designated outside of Class A airspace, to separate or segregate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted.

25–1–2. PURPOSE

MOAs are designated to contain nonhazardous, military flight activities including, but not limited to, air combat maneuvers, air intercepts, low altitude tactics, etc.

25–1–3. IDENTIFICATION

Identify a MOA by a name followed by the acronym MOA and the two–letter state abbreviation (e.g., Dome MOA, AZ). MOA subdivisions may be identified by a suffix consisting of a number, letter, cardinal point, or the terms "High" or "Low," (e.g., Moody 1; Gamecock B; Tiger North; Smoky High). Either the proponent or the service area office selects MOA names.

NOTE–
Select an easily understood word. Lengthy or composite names are cumbersome and tend to be confusing when communicating and in charting.

25–1–4. MOA FLOOR

MOAs may extend below 1,200 feet AGL if a mission requirement exists and there is minimal adverse aeronautical effect. Provisions must be made to enable aerial access to private and public use land beneath the area, and for terminal VFR and IFR flight operations. Provisions must also be made to accommodate instrument arrivals/departures at affected airports with minimum delay. The MOA shall exclude the airspace 1,500 feet AGL and below within a 3 NM radius of airports available for public use. This exclusion may be increased if necessary based on unique circumstances. If the MOA floor extends below 1,200 feet AGL over a charted private airport, coordination should be effected with the airport operator to determine whether there would be any conflict between the MOA activity and airport operations.

25–1–5. LOCATION

MOAs should be located to create minimum adverse impact on nonparticipating aircraft operations. MOAs shall not be established offshore beyond the United States 12 NM territorial limit. To the extent possible, locate MOAs:

a. Within 100 miles of the user's base of flight origin.

b. Outside terminal area airspace, Federal airways, charted terminal VFR routes, and known high volume VFR flyways.

c. Within radar and communications coverage of an ATC facility or MRU.

NOTE–
Do not designate MOAs to overlap existing, charted Terminal Area VFR Routes, or charted VFR Flyways (See FAAO JO 7210.3, chapter 11, National Programs).

25–1–6. JOINT USE

a. In effect, MOAs are always joint use in that VFR aircraft are not denied access, and IFR aircraft may be routed through the airspace, by agreement between controlling and using agencies, when approved separation can be provided from the MOA activity.

b. Procedures for access to the airspace by nonparticipating IFR traffic shall be specified in a letter of agreement between the controlling and using agencies.

25–1–7. TEMPORARY MOAs

a. Temporary MOAs are designated to accommodate the military's need for additional airspace to periodically conduct exercises that supplement routine training. When existing airspace is inadequate to accommodate these short–term military

exercises, temporary MOAs may be established for a period not to exceed 45 days. On a case-by-case basis, Airspace and Rules may approve a longer period if the proponent provides justification for the increase.

b. When it is determined that the need for a temporary MOA will occur on a regular and continuing basis, the airspace should be considered for establishment as a permanent MOA with provisions for activation by NOTAM/Special Notice disseminated well in advance of scheduled exercises.

c. Once a temporary MOA is approved, the military shall be responsible for publicizing the exercise within 100 miles of the affected airspace. The publicity may be accomplished through the public media, pilot forums, distribution of information bulletins to known aviation interests, etc.

25-1-8. MOAs IN CLASS G AIRSPACE

MOAs may be designated in Class G airspace. Using agencies and pilots operating in such MOAs should be aware that nonparticipating aircraft may legally operate IFR or VFR without an ATC clearance in these MOAs. Pilots of nonparticipating aircraft may operate VFR in Class G airspace in conditions as low as 1 statute mile flight visibility and clear of clouds (see Section 91.155 for complete Class G airspace VFR minima). Any special procedures regarding operations within MOAs that encompass Class G airspace should be included in a letter of agreement between the controlling and using agencies.

Section 2. Processing

25–2–1. SUBMISSION OF PROPOSALS

Submit MOA proposals, other than temporary MOAs, to the service area office at least 8 months prior to the desired effective date (see paragraph 25–2–2 for temporary MOA proposals). The following schedule is an estimate of the minimum time needed to process proposals that are non–controversial, without significant aeronautical impact, and require only routine coordination.

NOTE–
Proposals that are complex, controversial, or require extensive environmental analysis could need up to 24 months or more additional processing time beyond that shown in TBL 25–2–1.

TBL 25–2–1

Calendar Days	Action
D	Proposal received by FAA regional/ service area office.
D+30	Proposal reviewed by region/service area office. Nonrule circular published. Aeronautical study initiated, as required.
D+75	Public comment period ends. Aeronautical study due.
D+105	Comments reviewed by region and recommendation sent to Airspace and Rules.
D+165	Proposal, comments, and recommendation reviewed by Airspace and Rules. NACO coordination and final determination.
D+175	NACO cutoff date. MOA published in NFDD on or before this date.
D+231	MOA effective date and/or 56–day airspace effective date.

25–2–2. TEMPORARY MOA PROCESSING

a. Submit temporary MOA proposals to the service area office at least 4 months prior to desired effective date (See TBL 25–2–2). When there is a known requirement for multiple activations of the same temporary MOA over a specific time period, proponents are encouraged to combine the requests into a single proposal covering the entire period. This will provide notice to the public that is more effective and reduce administrative processing workload.

b. Temporary MOA effective dates are determined by the exercise requirements rather than the 56–day en route chart cycle used for permanent SUA. Consequently, a shorter overall processing time is required.

c. See paragraph 21–1–15 of this order for graphic notice and narrative description information to be submitted with the proposal package.

d. For recurring temporary MOAs, an abbreviated proposal package may be submitted at the discretion of the service area office. See paragraph 21–3–4 of this order for details.

TBL 25–2–2

Calendar Days	Action
D	Proposal received by FAA regional/ service area office.
D+30	Proposal reviewed by region/service area office; Nonrule circular published; aeronautical study initiated.
D+75	Public comment period ends. Aeronautical study due.
D+105	Comments reviewed by region/ service area office. Recommendation sent to Airspace and Rules.
D+135	Proposal, comments, and recommendation reviewed by Airspace and Rules. NACO coordination and final determination. Graphic Notice sent to NOTAM Publication.

Chapter 26. Alert Areas

Section 1. General

26–1–1. DEFINITION

An alert area is airspace wherein a high volume of pilot training or an unusual type of aeronautical activity is conducted.

26–1–2. PURPOSE

Alert areas are designated to inform nonparticipating pilots of areas that contain a high volume of pilot training operations, or an unusual type of aeronautical activity, that they might not otherwise expect to encounter. Pilots are advised to be particularly alert when flying in these areas.

26–1–3. LOCATION

Alert areas shall not extend into Class A, B, C, and D airspace, or Class E airport surface areas. To the extent possible, alert areas should avoid Federal airways, major terminal areas, and high volume VFR routes. Once an alert area is designated, the establishment of Federal airways through such areas should be kept to a minimum.

26–1–4. ACTIVITIES

a. Only those activities that do not pose a hazard to other aircraft may be conducted in an alert area.

b. All alert area activities shall be conducted in accordance with visual flight rules, and in compliance with applicable Sections of 14 CFR.

c. Automated Flight Service Stations/Flight Service Stations may broadcast information regarding alert area activities as circumstances dictate.

26–1–5. IDENTIFICATION

Alert areas shall be identified by the letter “A” prefix followed by a dash, a two or three digit number, a location, and the two–letter state abbreviation (e.g., A–292, Pensacola, FL). A letter suffix is used to indicate subdivisions. Identification numbers are assigned by Airspace and Rules. Aeronautical charts shall be annotated to reflect the type of activity conducted in the alert area.

Section 2. Criteria

26–2–1. GENERAL

a. Alert areas should be designated only at those locations where it is determined that either the volume of training operations, or the unusual aeronautical activity, is so unique that dissemination of the information would be of operational value to the flying public, and would significantly enhance aviation safety.

NOTE–
Before proposing an alert area, consider whether the publication of an advisory note on aeronautical charts near the affected location would provide satisfactory notice of the activity to nonparticipating pilots.

b. Alert areas may be designated for either military or civil aviation activities.

c. Since pilots should normally expect to encounter concentrated air traffic near major military and civil airports, the establishment of alert areas at such locations is not recommended in order to avoid diminishing the effectiveness of the alert area designation.

d. Alert areas should not be designated for activities where other approved charting symbology is more appropriate (e.g., Parachute Jumping Areas, Glider Operating Areas).

e. Establishment of an alert area is not a prerequisite to conduct any type of flight activity.

f. Other than the basic requirement to comply with applicable sections of 14 CFR, alert areas do not impose any flight restrictions or communications or ATC clearance requirements on pilots either operating within, or transiting the area.

26–2–2. TYPES OF OPERATIONS

Limit the establishment of alert areas to the following types of operations:

a. Concentrated Student Training.

1. A high volume of flight training operations at one or more airports in a given area. The volume of activity should exceed 250,000 local operations (as defined in FAAO JO 7210.3, chapter 12, Facility Statistical Data, Reports, and Forms) annually and be generated primarily by student training in fixed–wing and/or rotary–wing aircraft.

2. A pilot training area beyond a 20 NM radius of the airport that contains unusually intensive training operations.

b. Unusual Aeronautical Activity. There are no specific criteria established for this category. Each proposal will be evaluated on a case–by–case basis to determine its significance to the flying public and aviation safety.

NOTE–
One example of an alert area fitting this category is A–381, designated to identify the unusual concentration and volume of aviation activity in the U.S. Gulf Coast/Gulf of Mexico area.

Section 3. Processing

26–3–1. ALERT AREA PROPOSALS

Alert area proposals shall contain all applicable items listed in chapter 21, section 3 of this Order; except that designation of a controlling agency, completion of an aeronautical study, and FAA environmental analysis are not required.

26–3–2. SUBMISSION OF PROPOSALS

Submit alert area proposals to the service area office at least 6 months prior to the desired effective date. The following schedule is an estimate of the minimum time needed to process proposals that require only routine coordination.

NOTE–
Controversial proposals may require significantly greater processing time than that shown in TBL 26–3–1.

TBL 26–3–1

Calendar Days	Action
D	Proposal received by FAA regional/ service area office.
D+30	Proposal reviewed by region/ service area office. Nonrule circular published.
D+75	Public comment period ends.
D+105	Comments reviewed; recommendation sent to Airspace and Rules
D+135	NACO coordination; proposal, comments and recommendation reviewed by Airspace and Rules. Final determination.
D+145	Alert Area cutoff date and effective date published in NFDD.
D+145–201	Within this time frame; NACO cutoff date and Alert Area effective date.

Chapter 27. Controlled Firing Areas

Section 1. General

27–1–1. DEFINITION

A controlled firing area (CFA) is airspace designated to contain activities that if not conducted in a controlled environment would be hazardous to nonparticipating aircraft.

27–1–2. PURPOSE

CFAs provide a means to accommodate, without impact to aviation, certain hazardous activities that can be immediately suspended if a nonparticipating aircraft approaches the area.

27–1–3. CRITERIA

a. CFAs should be considered only when necessary to accommodate activities that are capable of being immediately suspended, and it has been specifically determined that designation of a restricted area is not warranted.

b. The distinguishing feature of a CFA, compared to other SUA, is that CFA activities shall be suspended immediately when a nonparticipating aircraft approaches the area. The responsibility lies totally with the CFA user to terminate activities so that there is no impact on aviation. There is no requirement for nonparticipating aircraft to avoid the airspace, nor are any communications or ATC separation requirements imposed.

27–1–4. CHARTING

CFAs are not depicted on aeronautical charts because the user terminates the activities when required to prevent endangering nonparticipating aircraft.

27–1–5. DIMENSIONS

Although there are no set limits to the dimensions of a CFA, the size of the area must be reasonable considering the types of activities conducted, and surveillance, communications, and activity termination capabilities.

27–1–6. ACTIVITIES

a. Only those activities that can be immediately suspended on notice that a nonparticipating aircraft is approaching are appropriate for a CFA. Examples of such activities include:

1. Ordnance disposal.

2. Blasting.

3. Static testing of large rocket motors.

b. CFAs are not intended to contain aircraft ordnance delivery activities. Operation of observer or surveillance aircraft is permitted.

c. Other activities (e.g., artillery, etc.) may be considered provided they can meet the criteria and comply with the safety precautions prescribed in this chapter.

d. CFAs may be designated for either military or civil activities.

27–1–7. APPROVAL

The service area office is the approval authority for CFAs. For other than one–time events, CFAs should be approved for a specific period as determined by the service area office. An expiration date shall be assigned for each CFA.

27–1–8. SUSPENSION OR REVOCATION

The service area office may suspend or revoke a CFA if a question arises about the safety of the operation, compliance with safety precautions or conditions of approval, or if unforeseen impact on aeronautical operations occurs.

Section 2. Processing

27–2–1. SUBMISSION REQUIREMENTS

Submit CFA proposals to the appropriate service area office at least 4 months prior to the desired effective date.

27–2–2. CFA PROPOSALS

CFA proposals shall include the applicable items from Chapter 21, Section 3. In addition, provide the following information:

a. Justification for establishing a CFA instead of a restricted area.

b. Surveillance and safety procedures to be applied.

27–2–3. REGIONAL/SERVICE AREA OFFICE ACTION

Upon receipt of a CFA proposal, the service area office shall:

a. Assign a nonrulemaking study number.

b. Determine if circularization of the proposal is required.

c. Review the proposal for justification and compliance with CFA criteria.

d. Determine if the proposed CFA would conflict with the requirements of other airspace users. Consider proximity of Federal airways, VFR flyways, etc.

e. Evaluate the adequacy of surveillance and safety procedures.

f. Determine limitations, safety precautions, or other requirements to be observed as conditions of approval.

g. If the operation also requires a waiver to part 101, process that waiver and complete FAA Form 7711–1, Certificate of Waiver or Authorization.

h. Issue an approval letter to the proponent (see paragraph 27–2–4), or inform the proponent in writing if the CFA is disapproved.

27–2–4. APPROVAL LETTER

Inform the proponent in writing of the approval or renewal of the CFA. Include the following information as required:

a. CFA description (boundaries, altitudes, and times of use).

b. Activity for which the CFA is approved.

c. Using agency name.

d. Effective/expiration date(s).

e. Conditions, operating limitations, and/or safety precautions to be observed (see Section 3 of this chapter).

f. Additional provisions, if needed.

g. Instructions for the user to notify the operators of airports in the vicinity of the CFA of the activities to be conducted, if required.

h. If applicable, attach FAA Form 7711–1.

i. Instructions and suspense date for submitting a CFA renewal request, if applicable.

Section 3. Safety Precautions

27–3–1. USER RESPONSIBILITIES

The CFA user shall:

a. Ensure that the activity is confined within the CFA.

b. Cease hazardous activity immediately upon observation or notification that a nonparticipating aircraft is approaching the area. Resume the activity only after the aircraft is clear of the CFA.

c. Make provisions to ensure the safety of persons or property on the surface, if applicable.

d. Retain full legal responsibility in event of any incident resulting from the activity conducted in the CFA.

27–3–2. PRECAUTIONARY MEASURES

a. The service area office must be satisfied that adequate safety precautions are in place for each CFA. Specific precautionary measures established to protect nonparticipating aircraft and persons and property on the surface will depend on various factors such as the type of activity, terrain, CFA dimensions, etc. The following measures are considered the minimum required and are mandatory for all CFAs:

1. The user shall appoint a safety officer to ensure that operations are conducted according to the requirements of this Order, and the CFA approval letter.

2. The base of the clouds shall be at least 1,000 feet above the highest altitude affected by the hazardous activity.

3. Visibility shall be sufficient to allow visual surveillance of the entire CFA, plus a distance of 5 miles beyond the CFA boundary in all directions.

4. The CFA shall be clear of nonparticipating aircraft or personnel before starting, and while conducting hazardous activities.

5. Projectiles shall not enter any cloud formation.

b. The service area office may establish other ceiling and visibility requirements, or additional precautionary measures, as required by the specific case.

NOTE–
CFA activities are terminated to avoid conflict with nonparticipating aircraft, therefore, there is no requirement for the issuance of a NOTAM.

27–3–3. AREA SURVEILLANCE

a. Surveillance shall be continuously maintained immediately prior to and during the time that hazardous activity is in progress.

b. Surveillance may be accomplished by trained ground observers, aircraft, surface vessels, or a combination of methods. Radar may be used to supplement visual surveillance of the area.

c. A sufficient number of trained observers shall be used to ensure adequate coverage of the required area.

d. Observers shall be provided with continuous, effective communications with all firing points. If at any time communication is lost, hazardous activity shall cease until reliable communication is reestablished.

Chapter 28. National Security Areas

Section 1. General

28–1–1. DEFINITION

A National Security Area (NSA) consists of airspace of defined vertical and lateral dimensions established at locations where there is a requirement for increased security of ground facilities. Pilots are requested to voluntarily avoid flying through an NSA. When it is necessary to provide a greater level of security, flight in an NSA may be temporarily prohibited pursuant to the provisions of 14 CFR 99.7, Special Security Instructions. Where there is a need to restrict flight operations in an NSA, the required restriction will be issued by Airspace and Rules and disseminated via NOTAM.

28–1–2. PURPOSE

An NSA is designated to enhance national security and protect national assets.

28–1–3. CRITERIA

An NSA should be considered when a need to protect national assets or a need to protect an area in the interest of national security is identified.

28–1–4. DIMENSIONS

There are no standard dimensions for an NSA. The dimensions should be the minimum to promote the protection of the national asset or area identified.

28–1–5. CHARTING

NSAs shall be depicted on aeronautical charts to inform users of the NAS regarding their vertical and lateral dimensions. Additionally, a note shall be depicted on the chart adjacent to the NSA stating the requested avoidance altitude.

28–1–6. EXPIRATION, SUSPENSION, OR REVOCATION

An NSA does not expire. However, an NSA may be suspended or revoked at the discretion of Airspace and Rules.

Section 2. Processing

28–2–1. NSA PROPOSALS

NSA proposals shall contain all applicable items listed in Chapter 21, Section 3, of this order. References to environmental analysis, ATCAAs, controlling agency, using agency, and times of use are not required.

28–2–2. SUBMISSION OF PROPOSALS

a. An NSA proposal may be initiated by any agency of the Federal government. Send any NSA proposal to the service area office at least 6 months prior to the desired effective date. Such requests shall include sufficient justification for the requested action.

b. Requests should be sent to the service area office responsible for the affected area.

28–2–3. REGIONAL/SERVICE AREA OFFICE PROCESSING

The service area office shall evaluate the effect of proposals on aircraft operations in the NAS as specified in Chapter 21. The service area office shall then forward their recommendation and justification to Airspace and Rules for processing.

28–2–4. AIRSPACE AND RULES PROCESSING

Upon receipt of an NSA proposal, Airspace and Rules shall:

a. Review the proposal for justification and impact on aircraft operations in the NAS.

b. Coordinate the request as appropriate.

c. Approve or disapprove the request.

d. Forward the approved request to Aeronautical Information Management for charting.

e. Take action to suspend or revoke the NSA when it is no longer justified.

f. Take appropriate action to inform users of the designation, suspension, or revocation of the NSA.

2–6–6. AGENDA ITEMS

Agenda items may be included in the notice of informal airspace meeting or distributed separately. Agendas may also include airspace matters of a rulemaking and/or nonrulemaking nature. When not included in the notice of informal airspace meeting, they should be distributed at least 15 days before the meeting. Agendas involving Class B airspace proposals, shall be distributed at least 30 days prior to the meeting. Items concerning aeronautical studies not on the agenda should not be discussed except when the chairperson considers them appropriate.

2–6–7. RECORD OF MEETINGS

a. Official transcripts or minutes of informal airspace meetings shall not be taken or prepared. However, the chairperson shall prepare a memorandum for each of the discussed aeronautical study files listing attendees and a digest of the discussions held.

b. Written statements received from attendees during and after the informal airspace meeting shall also be included in the study files.

c. Forward one copy of the memorandum to Airspace and Rules.

Chapter 32. Environmental Matters

Section 1. General Information

32–1–1. PURPOSE

This section provides guidance and establishes policy and procedures to assist air traffic personnel in applying the requirements of FAAO 1050.1E, Environmental Impacts: Policies and Procedures, to proposed air traffic actions. The guidance in this chapter will assist air traffic personnel in determining the level of environmental study appropriate for a proposed action and in preparing the required environmental documentation.

The policies and procedures set forth in this chapter are intended to supplement the requirements of FAAO 1050.1E and other Department of Transportation and FAA directives.

Further, this chapter outlines the approach for considering environmental issues and helps reduce the complexity of the review process, while ensuring that the environmental process associated with proposed air traffic actions is thoroughly and properly documented.

32–1–2. POLICY

It is air traffic policy to use an interdisciplinary approach to assure compliance with all environmental laws and regulations. This policy requires that all projects be reviewed as early as possible to determine if there is the potential for impact to the quality of the human environment. All units of the Air Traffic Terminal, En Route and Oceanic, and System Operations Service Units shall adhere to the requirements in FAAO 1050.1E.

In addition, all units shall comply with the guidelines and directions detailed in this chapter whenever reviewing regulatory and nonregulatory airspace actions.

32–1–3. BACKGROUND

a. FAAO 1050.1E establishes policies and procedures and assigns responsibility for assuring FAA compliance with the National Environmental Policy Act of 1969, as amended (NEPA), the implementing regulations issued by the Council on Environmental Quality (CEQ) (40 CFR parts 1500–1508), the Department of Transportation (DOT) Order 5610.1, FAAO 1050.1E, and other related statutes and directives.

b. The complexity of environmental issues associated with some air traffic activities necessitates a systematic and uniform approach to the environmental review process. This process must assess all impacts, as well as provide the data for preparing the necessary documentation.

c. FAAO 1050.1E provides the overall procedures and guidance for the FAA's environmental responsibilities. It is the intent of this chapter to complement, and not repeat in its entirety, what is already contained in FAAO 1050.1E. However, there are issues addressed in FAAO 1050.1E that require further detail for air traffic or additional emphasis to ensure they are properly addressed.

This chapter is designed to address these unique actions (i.e., special use airspace proposals) and provide the additional detail necessary for air traffic to conduct an adequate environmental review.

32–1–4. DELEGATION OF AUTHORITY

The Approving Official for Environmental Assessments (EAs), Findings of No Significant Impact (FONSIs) and Environmental Impact Statements (EISs) is the FAA official with signature authority for these documents. The FAA official with signature authority to approve a Record of Decision (ROD) is the decision–maker (see Order 1100.154A, Delegation of Authority).

a. The air traffic Facility Manager has signature authority for memoranda related to administrative actions listed in FAAO 1050.1E, paragraph 200e(4) and advisory actions discussed in FAAO 1050.1E, paragraphs 200e(1) and 301.

b. The Air Traffic Organization Terminal and En Route and Oceanic Operations Service Area

Directors have signature authority for Categorical Exclusions (CATEXs), EAs, FONSIs, EISs, and RODs which are exclusively within the scope of a single Service Area, and may delegate this authority to a Manager within that Service Area. For Special Use Airspace (SUA) actions that require approval at the Headquarters level, the associated environmental document also requires approval and signature at the Headquarters level.

The Terminal Service Area is responsible for air traffic NEPA compliance for proposed actions within the jurisdiction of a terminal Air Traffic Control (ATC) facility.

The En Route and Oceanic Service Area is responsible for air traffic NEPA compliance for proposed actions not associated with an ATC terminal facility. Additionally, the En Route and Oceanic Service Area will be designated as the point of contact for the establishment or modification of SUA or Military Training Routes (MTRs) when requested by another Federal agency.

When a proposed action requires involvement by both the Terminal and En Route and Oceanic Service Area, the Terminal Service Area will be the lead entity for NEPA compliance.

c. The Terminal and/or En Route and Oceanic Service Unit Vice Presidents have signature authority to sign EAs, FONSIs, EISs, and RODs that are beyond the scope of authority of a single Service Area.

d. The System Operations Airspace and AIM, Environmental Programs Group is responsible for coordinating environmental processes that cross Service Area boundaries.

32-1-5. RESPONSIBILITIES

The order of delegated authority for air traffic environmental processes is as follows:

a. System Operations Service Unit, System Operations Airspace and AIM, Environmental Programs Group. The Environmental Programs Group has been delegated authority to direct and implement environmental policy and procedures for air traffic actions. It shall design and initiate training programs to educate air traffic personnel in Headquarters, in the Terminal and En Route and Oceanic Service Areas and in air traffic field facilities on environmental laws, regulations, policies, and processes related to the implementation or revision of air traffic airspace and procedures.

The Environmental Programs Group shall direct and implement training for air traffic Environmental Specialists in the use of noise modeling tools (see subparagraph 32-1-5.b., Terminal and En Route and Oceanic Service Units and Service Areas). Additionally, the Environmental Programs Group shall serve as the air traffic focal point for the Headquarters Environmental Network chaired by the Office of Environment and Energy (AEE).

b. Terminal and En Route and Oceanic Service Units and Areas. The Vice Presidents of the Terminal and En Route and Oceanic Service Units have the final responsibility for ensuring that all appropriate environmental documentation within their area of jurisdiction is prepared accurately and completely.

The Terminal and En Route and Oceanic Service Area Directors shall be responsible for designating at least one person to serve as the Environmental Specialist within their Service Area to address air traffic environmental issues. Funding for training associated with the duties of the Environmental Specialist shall also be the responsibility of the Service Area Director (or the Director's designee).

In addition, the Service Area Director (or their designees) shall appoint a representative to serve as the focal point for their Service Area on the AEE Environmental Network. The representative shall coordinate any environmental activity in their Service Area with the Environmental Programs Group, as appropriate.

The Service Area Directors shall ensure that the Environmental Specialist attends the following training, as soon as practicable after their appointment to the position: 1) FAA Academy Courses #12000, Introduction to NEPA Requirements and Procedures (or an equivalent); 2) FAA Academy Course #50019, Airspace and Procedures (or an equivalent); 3) Community Involvement; 4) Integrated Noise Model (INM); and, 5) Noise Integrated Routing System (NIRS). Recurrent training to supplement these minimums should be provided, as appropriate.

c. Terminal and En Route and Oceanic Service Area Environmental Specialist.

1. The Service Area Environmental Specialist is responsible for reviewing environmental studies and forwarding written concurrence to the air traffic facilities originating any environmental documentation.

2. The Service Area Environmental Specialist shall provide guidance in and oversee the preparation of the air traffic initial environmental reviews (see Appendix 4), CATEXs, EAs, and EISs for air traffic actions.

3. The Service Area Environmental Specialist is responsible for preparation of FONSIs and RODs for air traffic actions.

4. The Service Area Environmental Specialist shall coordinate requests for training by personnel within their Service Areas with the Environmental Programs Group.

5. The Service Area Environmental Specialist shall review NEPA documentation initiated by the Technical Service Areas. In addition, the Service Area Environmental Specialist shall cooperate with Airport District Offices or the Airport Division, within their jurisdiction, on the preparation of NEPA documents and Federal Aviation Regulation Part 150 studies undertaken by these offices. Review and comments by the Service Area Environmental Specialist shall be directed to those matters affecting the operation of the air traffic program. Comments shall be forwarded to the appropriate Airports Program office. The Service Area Environmental Specialist may also be requested to attend public meetings or hearings to provide support to the Facility, Service Area, or other lines of business convening the meeting or hearing.

6. The Service Area Environmental Specialist shall act as the FAA environmental point of contact when another Federal agency (e.g., Department of Defense (DOD)) requests FAA participation as a Cooperating Agency on air traffic or airspace actions.

NOTE-
When a request for Cooperating Agency status is received from the DOD related to Special Use Airspace (SUA), a copy of Appendix 2 and Appendix 3, (flow charts for SUA environmental and aeronautical non-rulemaking and rulemaking actions, respectively) along with a copy of Appendix 4 (a summary of FAA procedures for processing DOD SUA actions), will be attached to the response. A copy of the response, which will also identify the Service Area environmental point of contact, will be provided to the appropriate Service Area.

Additionally, the Service Area Environmental Specialist shall review other agencies' environmental documentation when applicable (e.g., when the FAA is considering adopting the environmental documentation).

7. In the case of SUA actions, the Service Area Environmental Specialist shall review environmental studies in accordance with paragraph 32-2-3.

8. The Service Area Environmental Specialists shall coordinate with each other and with their counterparts in other agencies, as appropriate.

d. Air Route Traffic Control Center (Center), Terminal Radar Approach Control (TRACON), and Air Traffic Control Tower (ATCT) Facility Managers.

1. Center, TRACON, and ATCT Facility Managers shall be responsible for ensuring that all appropriate environmental documentation for proposed air traffic actions within their jurisdiction is prepared accurately and completely. These managers are responsible for recommending to the Service Area Environmental Specialist the appropriate level of environmental study.

For actions other than Advisory or Emergency Actions (as defined in FAAO 1050.1E), the Facility Manager shall ensure that, at a minimum, the Air Traffic Initial Environmental Review (IER) (see Appendix 5) is prepared and submitted to the Terminal or En Route and Oceanic Service Area Environmental Specialist along with the proposed action (see paragraph 32-2-1.a., Determination of Appropriate Environmental Documentation). Under some limited circumstances, the Service Area Environmental Specialist may waive the need for completion of the IER by substituting an appropriate level of documentation (i.e., memorandum to the file).

The ATCT Manager should be involved early in the design phase of a proposal to ensure that a full understanding of tower/airport operations is included in the alternatives development. The ATCT Manager is responsible for ensuring that information provided to the Center, and/or TRACON is complete and accurate.

The Facility Managers shall also be responsible for designating at least one facility staff specialist within their scope of operations to address environmental issues. The facility specialist may be required to perform his/her environmental duties on a full-time or collateral basis. The decision about the need for a full-time Environmental Specialist at a field facility shall be made by the Facility Manager.

The Facility Managers shall ensure that the specialist who performs environmental duties on a full-time basis attends the training specified in paragraph 32-1-5.b., Responsibilities, and numbered 1., 2., and 3., as soon as practicable. The INM and NIRS training are also recommended, but are not mandatory.

In addition, where other facilities have, or are authorized to have, an operations specialist (i.e., Plans and Programs Specialist, Procedure Specialists), to conduct environmental activities as a collateral duty, it is recommended that these specialists attend the above-referenced training.

2. The Facility Managers shall ensure that their facility is represented at Airport Program and other line of business NEPA and Airport Program Part 150 process meetings where decisions rendered could affect air traffic operations in their area of responsibility. The Facility Managers shall cooperate fully with operating divisions, airport sponsors, and contract support personnel in the environmental review processes. Additionally, air traffic attendance at these meetings does not necessarily constitute air traffic endorsement or sanction of the proposed action.

NEPA documents and FAR Part 150 studies must receive thorough review at the facility level. Review and comments on Airport Program documents shall be directed to those matters that affect the operation of the air traffic program. Facility comments must be forwarded to the Service Area Environmental Specialist, not more than 15 days after receipt of the document or study. (Requests for longer periods of review shall be coordinated with the Service Area Environmental Specialist on an as-needed basis.) Prior to a facility submitting comments directly to other operating divisions, or airport sponsors, the facility point of contact shall discuss the issues with the Service Area Environmental Specialist.

Facility Managers (or their designees) shall not make or recommend a proposed flight track, route or air traffic flow as a preferred action for the sole purpose of noise abatement. They may, however, indicate if the proposed action is operationally feasible or safe (within the context of aircraft separation standards). The airport sponsor (operator) is solely responsible for the recommendation of noise abatement procedures.

3. The field facility is responsible for preparing the IER and recommending a CATEX, an EA or an EIS for new or revised air traffic procedures, or airspace modifications. After completion of the IER, the originating facility shall forward the recommendation for a CATEX, EA or EIS along with all the supporting documentation to the Service Area Environmental Specialist for review and approval. The Service Area Environmental Specialist shall then prepare the Categorical Exclusion Declaration (if appropriate) for signature by the Service Area Director (or the Director's designee).

Section 2. Environmental Processing

32–2–1. PROCEDURES

The Terminal or En Route & Oceanic Service Area shall conduct the NEPA process for any proposed air traffic action in their area of jurisdiction with the potential to impact the human environment. Examples of air traffic actions include, but are not limited to, procedural changes that create new or alter existing flight tracks over noise sensitive areas or altitudes utilized by aircraft, certain SUA requests or changes, and initiatives effecting operational changes (e.g., changes in runway use percentage or heading). Environmental documentation for such actions must be completed prior to approval and subsequent implementation (see Appendix 1, "Environmental Study Process Flow Chart," for the steps from action concept to implementation).

If the FAA is not the proponent of the proposed action (e.g., the Department of Defense or an Airport Sponsor [the proponent] requests the FAA to take the action) then the proponent is responsible for funding and preparation of environmental documentation associated with the proposed action. FAAO 1050.1E, "Environmental Impact: Policies and Procedures," paragraph 203b and 203c discuss responsibility for preparation of EAs or EISs (respectively) where FAA must approve the project.

The proponent must prepare and submit the associated environmental documentation in conjunction with the proposed air traffic action, as follows:

a. Determination of Appropriate Environmental Documentation. The appropriate level of environmental documentation required must be determined after all portions of a proposed action have undergone the Air Traffic Initial Environmental Review (IER) (see Appendix 5). The IER must be used for all projects that will require headquarters–level funding for completion of the environmental process. For those projects not being funded at the headquarters level, completion of the IER is optional. Facility personnel and the Service Area Environmental Specialist must coordinate the IER process.

The completed IER, along with a recommendation as to whether the proposed action warrants no further environmental review, a CATEX, or preparation of an EA or an EIS must be forwarded to the Service Area Environmental Specialist. Field personnel must consult FAAO 1050.1E before making a recommendation on the appropriate level of environmental review for a proposed action. Following are specific sections of FAAO 1050.1E that must be reviewed.

1. Advisory Actions, paragraph 301. A memorandum to the file may be the only documentation necessary.

2. Emergencies, paragraph 302.

3. Extraordinary Circumstances, paragraph 304.

4. Categorical Exclusion, paragraphs 303 and 307 through 312, and Extraordinary Circumstances, paragraph 304. Only those categorical exclusions listed may be cited.

A review of Paragraph 305 will assist in determining the appropriate level of environmental documentation required for a CATEX (see Appendix 6 for a "Sample Categorical Exclusion Declaration").

5. Chapter 4 of FAAO 1050.1E addresses EAs and FONSIs. A review of this chapter will assist in determining when to prepare these documents. The FAA may adopt, in whole or in part, an EA prepared by another Federal agency. Consult FAAO 1050.1E paragraph 404d to determine if the EA meets the criteria for FAA adoption.

6. Chapter 5 of FAAO 1050.1E addresses EISs and RODs. A review of this chapter will assist in determining when and how to prepare these documents.

7. A review of FAAO 1050.1E, Appendix A, Section 14 will assist in determining whether a noise analysis is warranted and if so, what type of analysis should be conducted. A noise analysis requires several different types of input data including radar data. This data is available to FAA personnel.

However, requests for the FAA to release radar data, to other than FAA personnel, for use in noise studies or NEPA documents should be via FAAO 1200.22C, Use of National Airspace System (NAS) Computer and Radar Data or Equipment by Outside Interests, or the Freedom of Information Act (FOIA) process. It may be simpler and more expedient to utilize the

FOIA process, as FOIA does not require use of the Data Release Review Committee or a Memorandum of Agreement between the FAA Field Facility and an Environmental Contractor. Consultation with the Service Area Environmental Specialist should occur if radar data is needed.

b. Preparation of Environmental Documents. Following are the various levels of environmental studies and documentation that may be prepared.

1. No Further Environmental Action Required. Following review and consultation, the field Facility Manager and Service Area Environmental Specialist may agree that no additional documentation is required. When this occurs, the originating facility shall prepare a memorandum to the file indicating the basis for this determination (e.g., that the proposed action is administrative or advisory in nature and does not require additional environmental study) and include references to the provisions of FAAO 1050.1E that support the determination.

2. Actions Not Subject to NEPA Review. See FAAO 1050.1E, paragraph 200e(4), for a list of actions that require no environmental study.

3. Categorical Exclusions (CATEXs). After completion of the IER (when applicable), the originating facility shall forward the IER and any supporting environmental documentation to the Service Area Environmental Specialist for concurrence. The Service Area Environmental Specialist shall then prepare the Categorical Exclusion Declaration (see Appendix 6) for signature by the Service Area Director (or the Director's designee). A CATEX does not apply to a proposal if extraordinary circumstances as described in FAAO 1050.1E, paragraph 304, exist.

4. Environmental Assessments (EA). Although the Facility manager shall make a recommendation on the level of environmental review, the Service Area Environmental Specialist shall make the final determination as to whether the proposed action warrants preparation of an EA or an EIS. For proposed actions that warrant an EA, the Service Area Environmental Specialist may need to request additional resources and information to support the proposal.

FAAO 1050.1E, chapter 4 summarizes and supplements requirements of CEQ for EAs. The CEQ regulations do not specify a required format for an EA, however FAAO 1050.1E, paragraph 405, contains a sample format that will facilitate preparation of an EA, and integrate compliance with other environmental laws, regulations, and Executive Orders with NEPA review.

5. Findings of No Significant Impact (FONSI). If an EA reveals that a proposed air traffic action would not cause significant adverse impacts, the Service Area Environmental Specialist shall prepare a FONSI.

FAAO 1050.1E, paragraph 406, summarizes and supplements CEQ requirements for FONSIs. The CEQ regulations do not specify a format for FONSIs, but FONSIs must contain the information discussed in 40 CFR 1508.13. The FONSI may be attached to an EA, may be combined with the EA in a single document, or may be a stand-alone document. Paragraph 406 should be reviewed in detail prior to completion of a FONSI to assist in determining the type of document to prepare. If the FONSI is not combined with or attached to an EA, it must include a summary of the EA and note any other environmental documented related to it. If the FONSI is attached or included with the EA, the FONSI does not need to repeat any of the discussions in the EA but may incorporate them by reference. All documentation relied upon must be made available to the public upon completion of the environmental process.

If mitigation is included as a requirement in the FONSI, appropriate follow-up actions must be taken to ensure that the required mitigation is implemented. The Service Area preparing the FONSI is responsible for ensuring that the required mitigation is implemented.

6. Environmental Impact Statement (EIS). If a proposed action requires preparation of an EIS, the Service Area Environmental Specialist shall advise the Area Director when there is a need to seek funding and/or resources for the EIS. Consultation with the Environmental Programs Group regarding projects at this stage is highly recommended. If an independent contractor is to prepare the EIS, the Service Area Environmental Specialist shall oversee the preparation to ensure compliance with FAAO 1050.1E, paragraphs 503 through 511.

NOTE-
The Service Area Environmental Specialist shall ensure that all EAs and any subsequent EISs for proposed air traffic action within their area of jurisdiction meet the requirements of FAAO 1050.1E. The originating facility

is responsible for the accuracy of operational data and assumptions contained therein.

7. Record of Decision (ROD). For all proposed air traffic actions that have been the subject of an EIS, the Service Area Environmental Specialist shall prepare a ROD in accordance with FAAO 1050.1E, paragraph 512. (For proposed air traffic actions for which a FONSI is prepared, the Service Area Environmental Specialist should consider preparing a ROD in accordance with FAAO 1050.1E, paragraph 408.)

If an independent contractor prepares the EIS, that contractor may also support preparation of the ROD. However, the ROD documents the agency's decision on the Federal action and remains the responsibility of the FAA.

32–2–2. FAR PART 150 STUDIES

Airport Sponsors (Operators) may choose to conduct a FAR Part 150 study to analyze the operation of an airport, identify compatible and non–compatible land uses, and assess the costs and benefits of noise mitigation techniques. Noise Compatibility Programs that result from Part 150 studies often recommend modifications to air traffic routes and/or procedures to accomplish noise abatement. The FAA does not normally make changes in air traffic routes and/or procedures solely for the purpose of noise abatement. However, under Part 150, the FAA can approve flight procedures to reduce noise that are recommended in a Noise Compatibility Plan. If modifications to air traffic routes and/or procedures are recommended, air traffic will evaluate those recommendations as to feasibility and provide input to the appropriate Airports Program office.

While preparation of a FAR Part 150 study does not necessarily invoke NEPA, the potential implementation of recommended noise abatement measures, such as alternative air traffic procedures, is subject to the NEPA process by the air traffic program. During the Part 150 process, Facility Managers should keep the Airports Division or Airports District Office representative and the Service Area Environmental Specialist advised of any alternative air traffic control procedures that have the potential to invoke the NEPA process. The Facility Managers are responsible for ensuring that current operational data and assumptions (furnished to the entity completing the Part 150 process) are accurate and that future operational data and assumptions reflect reasonable conditions. (Operational data in this context relates to flight track and profile data and/or documentation.)

The facility environmental representative and the Service Area Environmental Specialist shall coordinate with the Airports Division or Airports District Office representative throughout the Part 150 process. This coordination should ensure that assumptions and data used are reviewed at each phase and results can be verified early in the process. Early coordination will allow for needed adjustments in any operational assumptions prior to completion of the study.

The Service Area Environmental Specialist shall coordinate with the Airports Division or Airports District Office personnel to furnish any data necessary for use in the FAR Part 150 study. Additionally, air traffic participation in the process does not constitute air traffic approval for a FAR Part 150 action.

During other noise studies conducted by the Airport Sponsor, Facility Managers and Service Area Environmental Specialists shall work with the Airport Sponsor and Airports Program personnel on the exchange of information as described above.

32–2–3. SPECIAL USE AIRSPACE (SUA)

The purpose of this section is to ensure that air traffic personnel and SUA proponents are aware of the need to comply with NEPA and CEQ requirements for evaluating the environmental impacts of proposed SUA actions. (See, e.g., FAAO 1050.1E, paragraph 401p.) This section supplements the airspace processing requirements contained in Part 5. of this document.

Normally, SUA is designated to support DOD requirements. The FAA/DOD Memorandum of Understanding (MOU) provided in Appendix 7, sets forth procedures and responsibilities for the evaluation of the environmental impacts of DOD SUA proposals. It designates when DOD is the lead agency and when FAA is the cooperating agency for NEPA compliance on SUA proposals.

Appendix 8, "FAA Special Use Airspace Environmental Processing Procedures," establishes air traffic environmental processing procedures for proposed SUA actions. In the case of SUA proposals submitted by non–DOD Federal agencies, the responsibility for

preparation of an EA or EIS, if required, rests with the proponent (i.e., the requesting Federal agency). However, the FAA retains responsibility under NEPA to ensure that its SUA actions are supported by adequate environmental documentation.

Section 3. Environmental Impact Categories and Other Topics

Appendix A of FAAO 1050.1E, "Analysis of Environmental Impact Categories" summarizes the requirements and procedures for environmental impact analyses according to the resource impact category. Executive Orders, DOT and FAA Orders, and memoranda and guidance documents described in Appendix C of FAAO 1050.1E may also contain requirements that apply.

Although all resource impact categories may receive the same level of review and analysis, the actual level of detail of review and analysis for a particular resource is dependent upon the potential for impact. The following paragraphs address those impact categories that often do not receive an appropriate level of environmental review for proposed air traffic.

32–3–1. DEPARTMENT OF TRANSPORTATION (DOT) ACT SECTION 4(f) (RECODIFIED AS 49 USC SECTION 303(c))

Air Traffic personnel need to consult with all appropriate Federal, state and local officials having jurisdiction over an affected Section 4(f) resource when determining whether project–related noise impacts would constitute a use of that resource.

FAAO 1050.1E, Appendix A, Section 6, provides guidance on matters relevant to Section 4(f). (See also Appendix 9, "Noise Policy for Management of Airspace Over Federally Managed Lands.")

32–3–2. ENVIRONMENTAL JUSTICE (TITLE VI/NEPA)

Air Traffic personnel need to know the process and requirements for environmental justice compliance.

DOT Order 5610.2, Environmental Justice, requires analysis of impacts of proposed FAA actions to ensure that minority and low–income population groups are not disproportionately affected. Additionally, FAAO 1050.1E, Appendix A, Section 16, summarizes the requirements and procedures to be used in environmental impact analysis related to environmental justice, as well as other socioeconomic impacts and children's environmental health and safety risks.

Facilities should identify who benefits and who is adversely affected by the proposed actions, while noting impacts on specific subgroups.

32–3–3. COMMUNITY INVOLVEMENT

Air Traffic personnel need to ensure that the FAA fulfills the spirit and the letter of NEPA, and that the environmental process is legal and efficient. Community involvement at the earliest possible time in developing alternatives is essential in the preparation of an EIS and, where appropriate, for an EA. The Service Area Directors (or their designee) shall ensure that the community involvement process is coordinated appropriately during the alternatives development process for proposed modification to air traffic airspace and/or procedures (see FAAO 1050.1E, paragraphs 208 and 209, and the FAA's "Community Involvement Policy" statement in Appendix 10 of this order).

32–3–4. CUMULATIVE IMPACTS

Air Traffic personnel shall ensure that cumulative impacts are appropriately addressed in all EAs and EISs for air traffic actions. Cumulative impacts are those that result form the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal and non–Federal) or person undertakes such other actions. Cumulative impacts may result from individually minor but collectively significant actions taking place over a period of time. (See FAAO 1050.1E, paragraph 405f(1)(c), and also "Considering Cumulative Effects Under the National Environmental Policy Act (1997).")

32–3–5. OTHER CURRENT AIR TRAFFIC ISSUES

Although there are other actions that may be initiated by Air Traffic to make changes in airspace and/or procedures, the following two categories are currently the largest. They have the potential to affect a number of field facilities and require the

involvement of additional personnel in the environmental review process.

a. Performance-Based Navigation (RNAV/RNP by GPS/FMS Equipped Aircraft).

The significant number of changes to airspace, route structures, and instrument approach and departure procedures precipitated by aircraft equipped with Global Positioning System (GPS) and Flight Management System (FMS) capabilities has the potential to cause a significant increase in actions affecting the environment.

Among these navigation systems are several concepts. For brevity, only two of these concepts will be addressed here; Area Navigation (RNAV) and Required Navigation Performance (RNP).

RNAV is a method of navigation that enables aircraft to fly on any desired flight path within the coverage of specific navigational aids (NAVAIDS) or within the capable limits of a self-contained system. RNAV can also be a combination of capabilities from a self-contained system and specific NAVAIDS.

RNP refers to RNAV operations that provide navigation containment and have flight monitoring capabilities.

The added flexibility and proliferation of these navigation systems has the potential to affect the human environment. This is due, in part to the introduction of instrument flight rules procedures not previously applied to low altitude aircraft operations, and the anticipated reduction in separation standards. It is imperative to fully examine and document the environmental impact of each step in the RNAV and RNP development process.

b. National Airspace Redesign (NAR).

The NAR is a program developed to review the design of all national airspace resources to ensure effective and efficient management of the national airspace system (NAS). The goals of the NAR are to:

1. Increase system flexibility, predictability, and access;

2. Maintain and improve system safety;

3. Improve efficiency and reduce delays; and

4. Support the evolution of emerging technologies.

Projects related to the NAR generally involve large-scale airspace changes that include multiple airports and terminal radar areas. It is generally the environmental process associated with these larger scale airspace changes that require completion of the Initial Environmental Review and funding at the headquarters level. Periodically there are other airspace changes, which may be related to larger-scale NAR projects but may only involve a single airport.

32-3-6. RECORDS RETENTION

Records retention must be in accordance with the appropriate paragraph(s) in FAAO 1350.15, Records Organization, Transfer, and Destruction Standards.

NOTE-
Although chapter 10 of FAAO 1350.15 contains Air Traffic-specific information, guidance for retention of environmental documentation is contained in that portion of the order specific to the Airports Division.

Environmental record-keeping should receive special attention at the field facility level. If an action requires preparation of an EA or an EIS, the Service Area Environmental Specialist shall maintain the Administrative Record. The Administrative Record is important in the environmental process because it is a compilation of all the information relied upon by in the FAA decision-making process.

Since some environmental projects may extend over several years, the Administrative Record becomes a history of events. In the event of a legal challenge, the Administrative Record will be reviewed by the U.S. Court of Appeals to determine if the FAA complied with the requirements of NEPA. The data and documentation contained in the record can also be used as the starting point for any follow-on environmental studies.

Field facility personnel shall consult with their Service Area Environmental Specialist to obtain guidance on what should or should not become part of the Administrative Record. Regional counsel or AGC-620, as appropriate, should also be consulted on this. Federal court rules provide that when an FAA action is challenged in court, the agency has 40 days to compile the Administrative Record, make necessary copies, and file an index to the record with the court. Therefore, it is preferable to begin development of the record at an early stage of a project, instead of waiting until a lawsuit is filed.

32–3–7. APPENDICES

a. Appendix 1. Environmental Study Process Flow Chart.

b. Appendix 2. Special Use Airspace Aeronautical Processing Flow Chart

c. Appendix 3. Special Use Airspace Environmental Processing Flow Chart

d. Appendix 4. FAA Procedures for Processing SUA Actions Summary Table

e. Appendix 5. Air Traffic Initial Environmental Review (IER)

f. Appendix 6. Sample Categorical Exclusion Declaration.

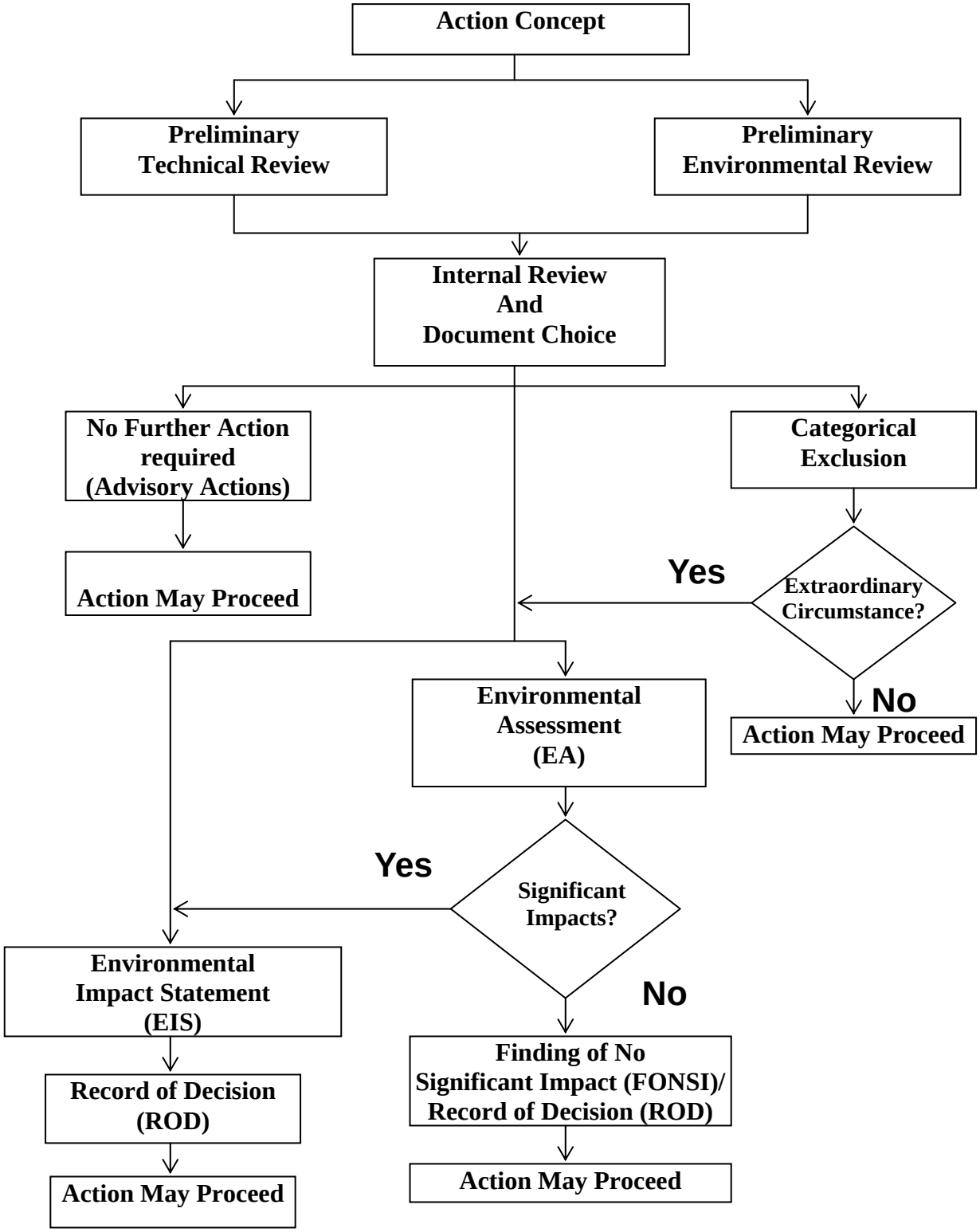
g. Appendix 7. FAA/DOD Memorandum of Understanding.

h. Appendix 8. FAA Special Use Airspace Environmental Processing Procedures.

i. Appendix 9. Noise Policy for Management of Airspace Over Federally Managed Lands.

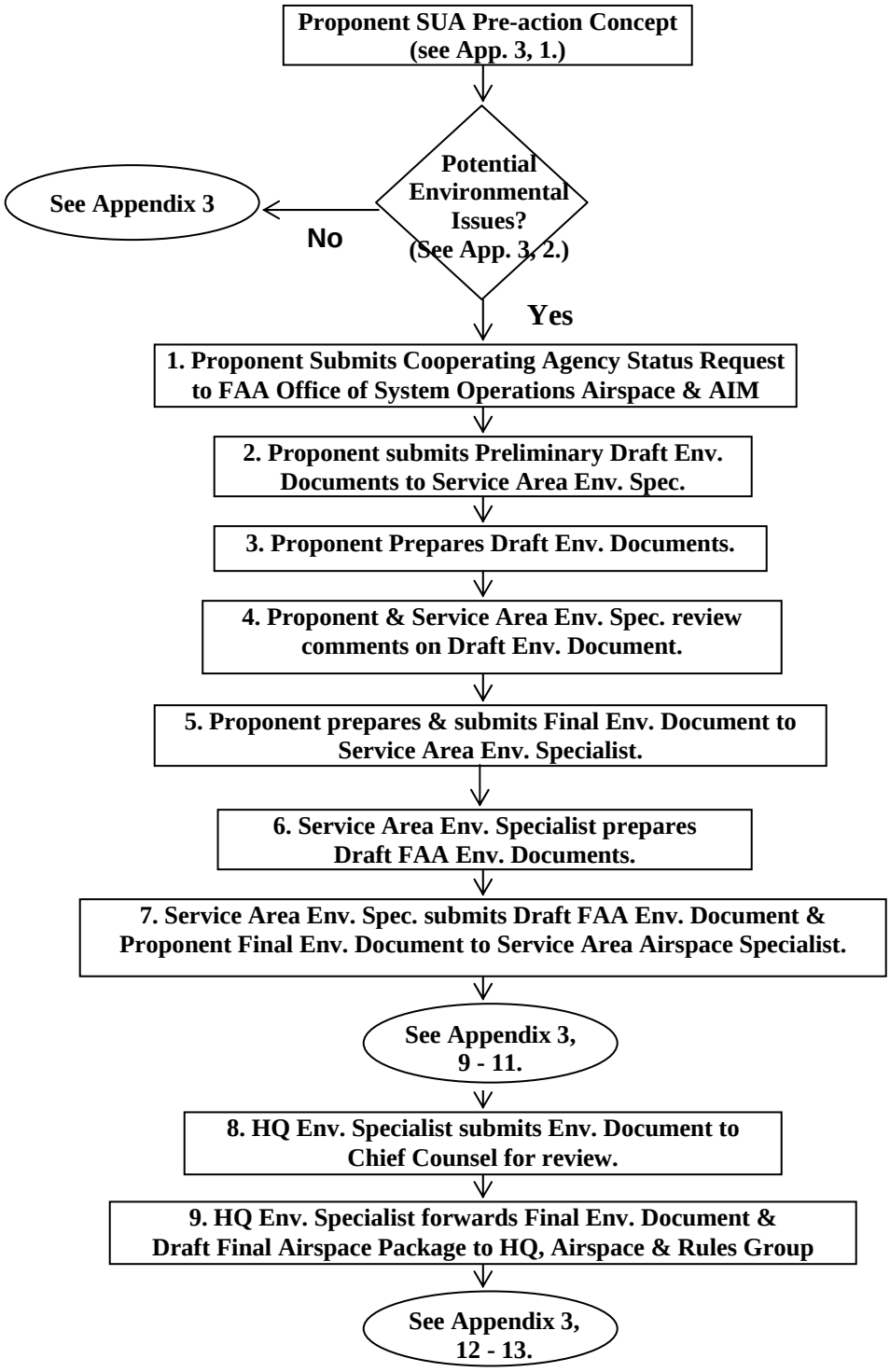
j. Appendix 10. Community Involvement Policy.

Appendix 1. Environmental Study Process Flow Chart



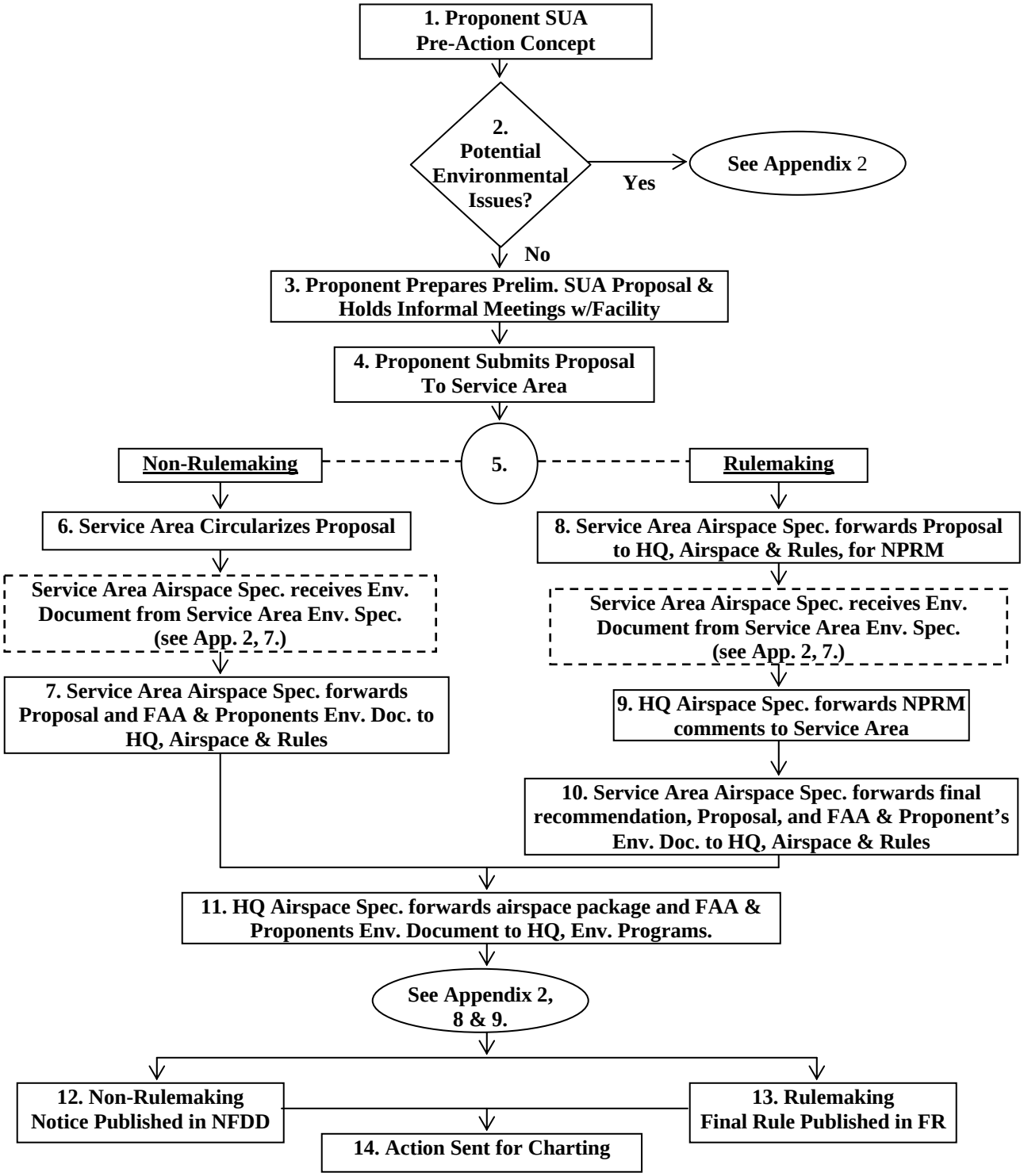
Appendix 2. Procedures For Processing SUA Actions Environmental Process Flow Chart

(This Chart is for use with Appendix 4 and the numbers correlate to the numbers in the Environmental column of that table.)



Appendix 3. Procedures For Processing SUA Actions Aeronautical Process Flow Chart

(This Appendix is for use with Appendix 4 and the numbers correlate to the numbers in the Aeronautical column of that table.)



Appendix 4. FAA Procedures for Processing SUA Actions Aeronautical and Environmental Summary Table

(The aeronautical and environmental processes may not always occur in parallel.)
(This Appendix is for use with Appendix 2 and Appendix 3, and the numbers correlate to numbers on those charts.)

(See note below.)

AERONAUTICAL	ENVIRONMENTAL
1. Proponent shall present to the Facility a Pre-draft concept (i.e., new/ revisions to SUA needed or required).	1. Proponent shall discuss with the Service Area, at the earliest time, the potential for environmental impacts associated with the proposal.
	2. If there is the potential for environmental impacts, Proponent shall make a request to the FAA for a Cooperating Agency (CA) status when Proponent decides to initiate the environmental process. Proponent shall forward the request to the Director of the System Operations Airspace and AIM. The Director will transmit the request to the Environmental Programs Group who prepares and forwards the response to Proponent. The Environmental Programs Group will send a courtesy copy of the response to the responsible Service Area. The Service Area environmental specialist works as the FAA point of contact throughout the process in development of any required environmental documentation.
	3. Proponent submits a Preliminary Draft EA or EIS to the Service Area environmental specialist. The Service Area environmental specialist shall provide comments, in consultation with the airspace specialist and the Environmental Programs Group, back to Proponent.

2. Proponent forwards the aeronautical proposal to the FAA Service Area for review and processing by the airspace specialist.	4. Proponent prepares a Draft EA or EIS with a 45-day public comment period. As the FAA CA point of contact, the Service Area environmental specialist reviews the associated draft environmental documentation to ensure that the Proponent addressed adequately all environmental concerns submitted on the Preliminary Draft. If required, the Service Area environmental specialist forwards the draft environmental documentation to the Environmental Programs Group for review and comment by the headquarters environmental specialist and the Office of Chief Counsel.
3. The Service Area airspace specialist, in accordance with this order, determines the type of airspace action(s) necessary, either Non-Rulemaking or Rulemaking. FAA Service Area and Proponent determine if informal Airspace Meetings are required.	
For Non-Rulemaking:	
4. The Service Area airspace specialist sends out a circularization with a 45-day public comment period. The Service Area airspace specialist reviews and prepares, in consultation with the Proponent, responses to the aeronautical comments from the study and circularization in accordance with Chapter 21 of this order.	5. The Proponent reviews comments received on their Draft EA/FONSI or EIS and prepares their responses to the comments, in consultation with the FAA and other cooperating agencies, if necessary, and in accordance with Chapter 32 of this order.
	6. Proponent prepares and submits their Final EA/FONSI or EIS/ROD to the Service Area environmental specialist.
	7. The Service Area environmental specialist prepares a Draft FAA FONSI/ROD or Draft FAA Adoption Document/ROD.
	8. The Service Area environmental specialist submits the Draft FAA FONSI/ROD or Draft FAA Adoption Document/ROD and the Proponent's Final EA/FONSI or EIS/ROD to the Service Area airspace specialist for inclusion with the airspace proposal package.
5. The Service Area airspace specialist then sends the completed package containing the aeronautical proposal, response to comments, Proponent's Final EA/FONSI, and the Draft FAA FONSI/ROD to the Headquarters Airspace and Rules Group with their recommendation.	

For Rulemaking:	
6. The Service Area airspace specialist sends the proposal to the Airspace and Rules Group who prepares a Notice of Proposed Rulemaking (NPRM). The Headquarters Airspace and Rules Group submits the NPRM for publication in the Federal Register with a 45-day comment period in accordance with Chapter 2 of this order.	
7. The Headquarters airspace specialist sends comments received on the NPRM to the Service Area airspace specialist for resolution.	
8. The Service Area airspace specialist then sends the completed package containing the response to comments, final service area recommendation, the proposal, Proponent's Final EA/FONSI or EIS/ROD, and the Draft FAA FONSI/ROD or Draft FAA Adoption Document/ROD to the Headquarters Airspace and Rules Group for preparation of the Final Rule.	
9. The Headquarters airspace specialist forwards the draft final rule package or draft non-rulemaking case summary (NRCS) with all supporting documentation to the Headquarters Environmental Programs Group for review (after all aeronautical comments have been resolved).	9. The Headquarters environmental specialist reviews the package for environmental technical accuracy; then submits the environmental documentation to the Office of the Chief Counsel, Airports and Environmental Law Division, for legal sufficiency review (having collaborated throughout the process).
	10. The Chief Counsel's environmental attorney's comments are incorporated into the final FAA environmental decision and signed by Headquarters Environmental Programs Group Manager. The package is then returned to the Headquarters Airspace and Rules Group.
10. For Non-rulemaking: The non-rulemaking action is published in the National Flight Data Digest. 11. For Rulemaking: The Final Rule is published in the Federal Register. The Final Rule will contain a reference to the decision rendered and location of documentation for the associated environmental process.	

Consult the following documents throughout the process for further information:

- Council on Environmental Quality Regulations for Implementing the National Environmental Policy Act (NEPA), 40 CFR Parts 1500–1508
- FAA Order 1050.1E, "Environmental Impacts: Policies and Procedures"
- FAA Order 7400.2, "Procedures for Handling Airspace Matters," Part 5
- FAA Order 7400.2, Chapter 32, "Environmental Matters" and the associated appendixes (for specific SUA environmental direction)

NOTE: The time periods below are for a non–controversial aeronautical proposal and its associated environmental process. The time periods are for FAA review/processing only. Times for proponent and/or environmental contract support processing must be added.

ENVIRONMENTAL: The estimated time of completion for EA processing is 12 to 18 months or, for EIS processing, 18 to 36 months.

AERONAUTICAL (Non–Rulemaking): A minimum 4 months is required from submission of the Formal Airspace Proposal by the Proponent to the Service Area through completion of the circularization process. Additionally, a minimum of 6 months is required from submission of the Formal Airspace Proposal by the Service Area to Headquarters through completion of the charting process.

AERONAUTICAL (Rulemaking): A minimum 6 weeks for Service Area processing, and a minimum of 9 months to complete rulemaking once the formal package is received at Headquarters.

Appendix 5. Air Traffic Initial Environmental Review

Facility/Office:_____ Date:_____

Prepared by: _____Phone: _____Fax:_____
(Also see Section X for the complete listing of preparers.)
==========
This initial environmental review should provide some basic information about the proposed project to better assist in preparing for the environmental analysis phase. Although it requests information in several categories, not all the data may be available initially. However, it does represent information, in accordance with FAAO 1050.1E, "Environmental Impacts: Policies and Procedures," which ultimately will be needed for preparation of the environmental document.

Project Description

A. Attach copy of the most recent Project Status Report.

B. Has airspace modeling been conducted using SDAT, TAAM, TARGETS, or other airspace/air traffic design tool? ☐ Yes Model: _____ ☐ No
If yes, provide a summary of the output from the modeling.

C. Describe the present (no action alternative) procedure in full detail. Provide the necessary chart(s) depicting the current procedure. Describe the typical fleet mix, quantifying (if possible) the number of aircraft on the route and depict their altitude(s) along the route.

D. Describe the proposed project, providing the necessary chart(s) depicting changes. Describe changes to the fleet mix, numbers of aircraft on the new route, and their altitude(s), if any.

1. Will there be actions affecting changes in aircraft flights between the hours of 10 p.m. – 7 a.m. local? Yes ☐ No

2. Is a preferential runway use program presently in effect for the affected airport(s), formal or informal? ☐ Yes ☐ No

3. Will airport preferential runway configuration use change as a result of the proposed project? ☐ Yes ☐ No

4. Is the proposed project primarily designed for Visual Flight Rules (VFR), Instrument Flight Rules (IFR) operations, or both? ☐ VFR ☐ IFR ☐ Both

If this specifically involves a charted visual approach (CVA) procedure, provide a detailed local map indicating the route of the CVA, along with a discussion of the rationale for how the route was chosen.

5. Will there be a change in takeoff power requirements? ☐ Yes ☐ No

If so, what types if aircraft are involved, i.e., general aviation propeller-driven versus large air carrier jets?

6. Will all changes occur above 3,000 feet above ground level (AGL)? ☐ Yes ☐ No

What is the lowest altitude change on newly proposed routes or on existing routes that will receive an increase in operations?

7. Will there be actions involving civil jet aircraft (heavier than 75,000 pounds gross weight) arrival procedures between 3,000-7,000 feet AGL or departures between 3,000-10,000 feet AGL? Attach a copy of the completed Air Traffic Noise Screening (ATNS) Model report.

8. If noise analysis was already performed using the FAA's Integrated Noise Model (INM) or Noise Integrated Routing System (NIRS), provide a summary of the results.

Purpose and Need

A. Describe the purpose and need for the proposed project. If detailed background information is available, summarize here and provide a copy as an attachment to this review.

B. What operational/economic/environmental benefits will result if this project is implemented?

1. If a delay reduction is anticipated, can the reduction be quantified? ☐ Yes ☐ No ☐ N/A

2. Can reduced fuel costs/natural energy consumption be quantified? ☐ Yes ☐ No ☐ N/A

If not quantifiable, describe the approximate anticipated benefits in lay terms.

C. Is the proposed project the result of a user or community request or regulatory mandate?

☐ Community Request ☐ Regulatory Mandate

If not, what necessitates this action?

Describe the Affected Environment

A. Provide a description of the existing land use in the vicinity of the proposed project.

B. Will the proposed project introduce air traffic over noise sensitive areas not now affected?

☐ Yes ☐ No

Will they be affected to a ☐ greater or ☐ lesser extent?

Note: An area is noise sensitive if aircraft noise may interfere with the normal activities associated with the use of the land. See FAAO 1050.1E for full definition of noise sensitive areas.

C. Are wildlife refuge/management areas within the affected area of the proposed project?

☐ Yes ☐ No

If so, has there been any communication with the appropriate wildlife management regulatory (federal or state) agencies to determine if endangered or protected species inhabit the area? ☐ Yes ☐ No

1. At what altitude would aircraft overfly these habitats?

2. During what times of the day would operations be more/less frequent?

D. Are there cultural or scenic resources, of national, state, or local significance, such as national parks, outdoor amphitheaters, or stadiums in the affected area? ☐ Yes ☐ No
If so, during what time(s) of the day would operations occur that may impact these areas?

E. Has there been communication with air quality regulatory agencies to determine if the affected area is a non-attainment area (an area which exceeds the National Ambient Air Quality Standards for ozone, carbon monoxide, lead, particulate matter, sulfur dioxide, or nitrogen dioxide) or maintenance area (an area which was in non-attainment but subsequently upgraded to an attainment area) concerning air quality?
☐ Yes ☐ No
If yes, please explain:

F. Are there reservoirs or other public water supply systems in the affected area?
☐ Yes ☐ No

Community Involvement

Formal community involvement or public meetings/hearings may be required for the proposed project. Make a determination if the proposed project has the potential to become highly controversial. The effects of an action are considered highly controversial when reasonable disagreement exists over the project's risks of causing environmental harm. Opposition on environmental grounds by a Federal, State or local government agency or by a Tribe, or by a substantial number of the person affected by the action should be considered in determining whether reasonable disagreement regarding the effects of a proposed action exists (see FAAO1050.1E, paragraph 304i).

A. Have persons/officials who might have some need to know about the proposed project due to their location or by their function in the community been notified, consulted, or otherwise informed of this project?
☐ Yes ☐ No

1. Are local citizens and community leaders aware of the proposed project?
☐ Yes ☐ No

2. Are any ☐ opposed to or ☐ supporting it? If so, identify the parties and indicate the level of opposition and/or support.
a. If they are opposed, what is the basis of their opposition?
b. Has the FAA received one or more comments objecting to the proposed project on environmental grounds from local citizens or elected officials? ☐ Yes ☐ No

Has the FAA received one or more comments objecting to the proposed project on environmental grounds from local citizens or elected officials? ☐ Yes ☐ No

If so, state the nature of the comment and how the FAA was notified (e.g. resolution, Congressional, Public meeting/workshop, etc.).

1. Are the airport proprietor and users providing general support for the proposed project?
☐ Yes ☐ No

2. Is the proposed project consistent with local plans and development efforts?
☐ Yes ☐ No

3. Has there been any previous aircraft-related environmental or noise analysis, including
   a. FAR Part 150 Studies, conducted at this location? ☐ Yes ☐ No
   b. If so, was the study reviewed as a part of this initial review? ☐ Yes ☐ No ☐ N/A

Extraordinary Circumstances

The determination of whether a proposed action may have a significant environmental effect is made by considering any requirements applicable to the specific resource (see FAAO 1050.1E, Appendix A).

A. Will implementation of the proposed project result in any of the following? As stated in 1050.1E, paragraph 304, extraordinary circumstances exist when a proposed action involves any of the following circumstances AND may have a significant effect (40 CFR 1508.4).

1. An adverse effect on cultural resources protected under the National Historic Preservation Act of 1966, as amended (see FAAO 1050.1E, paragraph 304a). ☐ Yes ☐ No ☐ Possibly
Comment:

2. An impact on properties protected under section 4(f) of the Department of Transportation Act (see paragraph 304b). ☐ Yes ☐ No ☐ Possibly
Comment:

3. An impact on natural, ecological (e.g. invasive species) or scenic resources of Federal, Tribal, State, or local significance (for example, Federally listed or proposed endangered, threatened, or candidate species or proposed or designated critical habitat under the Endangered Species Act); resources protected by the Fish and Wildlife Coordination Act; wetlands; floodplains; prime, unique, State, or locally important farmlands; energy supply and natural resources; wild and scenic rivers, including study or eligible river segments; and solid waste management. (See paragraph 304c.) ☐ Yes ☐ No ☐ Possibly
Comment:

4. A division or disruption of an established community; a disruption of orderly, planned development; or an inconsistency with plans or goals that have been adopted by the community in which the project is located (see paragraph 304d). ☐ Yes ☐ No ☐ Possibly
Comment:

5. An increase in congestion from surface transportation, by causing a decrease in the Level of Service below the acceptable level determined by the appropriate transportation agency (i.e., a highway agency). (See paragraph 304e.) ☐ Yes ☐ No ☐ Possibly
Comment:

6. An impact on noise levels of noise-sensitive areas (see paragraph 304f). ☐ Yes ☐ No ☐ Possibly
Comment:

7. An impact on air quality or a violation of local, State, Tribal, or Federal air quality standards under the Clean Air Act amendments of 1990 (see paragraph 304g). ☐ Yes ☐ No ☐ Possibly
Comment:

8. An impact on water quality, sole source aquifers, a public water supply system, or State or Tribal water quality standards established under the Clean Water Act and the Safe Drinking Water Act (see paragraph 304h). ☐ Yes ☐ No ☐ Possibly
Comment:

9. Effects on the quality of the human environment that are likely to be highly controversial on environmental grounds (see paragraph 304i). ☐ Yes ☐ No ☐ Possibly
Comment:

10. Likelihood of an inconsistency with any Federal, State, Tribal, or local law relating to the environmental aspects of the proposed action (see paragraph 304j). ☐ Yes ☐ No ☐ Possibly
Comment:

11. Likelihood of directly, indirectly, or cumulatively, creating a significant impact on the human environment (see paragraph 304k). ☐ Yes ☐ No ☐ Possibly
Comment:

Alternatives

A. Are there alternatives to the proposed project? ☐ Yes ☐ No

If yes, describe any alternatives to the proposed action.

B. Please provide a summary description of alternatives eliminated and why.

Mitigation

Are there measures, which can be implemented that might mitigate any of the potential impacts, i.e., GPS/FMS plans, NAVAIDS, etc.? ☐ Yes ☐ No ☐ N/A

Cumulative Impacts

What other projects (FAA, non-FAA, or non-aviation) are known to be planned, have been previously implemented, or are ongoing in the affected area that would contribute to the proposed project's environmental impact?

References/Correspondence

Attach written correspondence, summarized phone contacts using Memorandums for the File, etc.

Additional Preparers

The person(s) listed below, in addition to the preparer indicated on page 1, are responsible for all or part of the information and representations contained herein:

A. Name
B. Title
C. Facility/Agency/Company
D. Telephone Number
E. Specific area of Responsibility

Facility/Service Area Conclusions

This initial review and analysis indicates that extraordinary circumstances or other reasons exist that would cause the responsible federal official to believe that the proposed project might have the potential for causing significant environmental impacts.

The undersigned have determined that the proposed project may not qualify as a categorically excluded action in accordance with FAAO 1050.1E, and on this basis, recommend that further environmental review be conducted before the proposed project is implemented.

The undersigned recommend that the proposed project be submitted for environmental funding for preparation of an ☐ EA ☐ EIS ☐ Not sure ¿ more analysis is needed.

Facility Manager Review/Concurrence

Signature: _____ Date:_____

Title: _____

Address: _____

_____

Phone: _____ Fax: _____

Service Area Environmental Specialist Review/Concurrence

Signature: _____ Date: _____

Title: _____

Address: _____

_____

Phone: _____ Fax: _____

Service Area Director Review/Concurrence, if necessary

Signature: _____ Date: _____

Title: _____

Address: _____

_____

Phone: _____ Fax: _____

Appendix 6. Sample Department of Transportation Federal Aviation Administration Categorical Exclusion Declaration

(Facility/Airport)
(Title of Proposed Action)

Description of Action:

From the Initial Environmental Review, summarize the description of the action, and the purpose and need.

Declaration of Exclusion: The FAA has reviewed the above referenced proposed action and it has been determined, by the undersigned, to be categorically excluded from further environmental documentation according to FAAO 1050.1E, "Environmental Impacts: Policies and Procedures." The implementation of this action will not result in any extraordinary circumstances in accordance with FAAO 1050.1E.

Basis for this Determination: An Initial Environmental Review was conducted by _____ (INSERT the facility name) and reviewed by the _____ (INSERT the Terminal, or En Route & Oceanic Operations Service Area where Environmental Specialist is located). This review was conducted in accordance with policies and procedures in Department of Transportation Order 5610.1C, "Procedures for Considering Environmental Impacts" and FAAO 1050.1E.

The applicable categorical exclusion(s) is/are: _____ (INSERT a description of the appropriate CATEX(s) with FAAO 1050.1E paragraph reference(s) here).

Recommended by:

_____ Date: _____
(Name – Title of Facility Manager)

Concurrence:

_____ Date:_____
(Name – Service Area Environmental Specialist)

Approved by:

_____ Date:_____
(Name – Service Area Director (or Designee))

Appendix 7. FAA/DOD Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING BETWEEN
THE FEDERAL AVIATION ADMINISTRATION AND
THE DEPARTMENT OF DEFENSE
Concerning
Environmental Review of Special Use Airspace Actions

I. Purpose and Scope.

The purpose of this Memorandum of Understanding (MOU) is to describe the guidelines for compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321) and the Council on Environmental Quality (CEQ) Regulations (40 CFR Parts 1500–1508) without unnecessary duplication of effort by the Federal Aviation Administration (FAA) and the Department of Defense (DOD). This MOU promotes early coordination between FAA and DOD during the environmental review process associated with the establishment, designation, and modification of Special Use Airspace (SUA); permits the application of "lead agency" and "cooperating agency" procedures to environmental assessments (EA) and findings of no significant impact as well as to environmental impact statements (EIS); and provides for the issuance of environmental documents for the development, designation, modification, and use of SUA.

II. Definitions.

The definitions contained in the CEQ Regulations (40 CFR Parts 1500–1508), FAA Orders, and relevant DOD and/or Service guidance are applicable to this MOU.

III. Designation of Lead and Cooperating Agency.

A. Introduction: The actions taken by DOD and FAA in the establishment, designation, or modification of SUA are subject to environmental impact evaluation pursuant to NEPA, as implemented by the CEQ regulations. The CEQ regulations encourage a lead agency be designated where related actions by several Federal agencies are involved.

The lead agency, in such instances, is responsible for consultation with other agencies, for coordination of appropriate environmental studies and evaluations, and for preparation of any NEPA–related determinations or documents in cooperation with other Federal agencies. Each agency recognizes the need to eliminate duplication. The cooperating agency assumes responsibility to independently review the environmental documents prepared by the lead agency and to assess whether the environmental documents meet the standards for adequacy under NEPA.

The DOD and the FAA will ensure appropriate consideration of all actions and impacts, including cumulative impacts. The resultant environmental documents of the lead agency are accepted and used in decisions and planning by all agencies involved with the proposed action.

B. Designation of lead agency. When the DOD proposes that the FAA establish, designate, or modify SUA, the DOD shall serve as the lead agency for the evaluation of environmental impacts and the preparation and

processing of environmental documents. However, when the FAA proposes the establishment, designation, or modification of SUA affecting DOD, the FAA shall serve as the lead agency for the evaluation of environmental impacts and the preparation and processing of environmental documents.

C. Designation of cooperating agency. When the DOD proposes that the FAA establish, designate, or modify SUA, the FAA shall act as a cooperating agency for the evaluation of environmental impacts. However, when the FAA proposes the establishment, designation, or modification of SUA affecting DOD, the DOD shall act as a cooperating agency for the evaluation of environmental impacts.

IV. Level of Environmental Documentation

A. General. Environmental documentation will be processed in accordance with applicable FAA Orders, and DOD and/or Service directives.

B. Categorical Exclusions. Where the actions of one agency are subject to a categorical exclusion (CATEX), and the actions of the other agency, with respect to the same SUA request, require an EA, the agency requiring the EA will prepare the appropriate environmental documentation. The applicability of a CATEX to parts of the actions of one of the agencies will be noted in the environmental document. The background information in support of CATEXs, identified by either DOD or FAA, shall be forwarded to the agency requiring preparation of the EA and may be used by either agency, as allowed by their respective regulations/directives. When the categorical exclusion of the proponent is not listed in FAAO 1050.1E, Chapter 3, which would require FAA to prepare the environmental documentation; FAA budget constraints may delay processing and implementation of a proponent's proposal.

V. General Guidance

A. Scheduling. Whenever an action under this MOU requires cooperation or coordination between the FAA and DOD, the two agencies shall agree on a schedule to ensure that required actions are taken on a timely basis. Each agency will notify the other of any difficulty with meeting scheduled deadlines or any need to revise the schedule.

B. Resolution of disagreements. If the FAA and DOD fail to reach agreement at the normal working level on any issue relating to environmental processing of SUA proposals, the matter will be referred, in ascending order, as outlined in the table below. At any time, the FAA's Office of the Chief Counsel and the Office of the General Counsel of the Service Department involved shall be consulted for assistance with legal issues.

Equivalent Levels of Responsibility for Resolution of Disagreements	
FAA Administrator	Service Secretary
Vice President, System Operations Services	Policy Board on Federal Aviation (PBFA) Principal Member
Director, System Operations & Safety	PBFA Alternate Principal Member
Manager, System Operations & Safety, Environmental Programs	PBFA Working Group Member

VI. Effective Date. This MOU shall become effective on the last signature date below and shall remain in effect until otherwise rescinded or modified by both signatory parties. If either party determines that it is necessary to amend this MOU, the other party shall be notified in writing of the specific change(s) desired, with proposed language and the reason(s) for the amendment. The proposed amendment shall become effective upon written agreement of both parties.

SIGNED: DATE: October 4, 2005

Carl P. McCullough
Department of Defense

Michael A. Cirillo
Federal Aviation Administration

Appendix 8. FAA Special Use Airspace Environmental Processing Procedures

1. GENERAL.

This appendix provides guidance for FAA participation in the environmental review of proposed special use airspace (SUA) actions. The requirements in this appendix are in addition to the airspace proposal processing procedures contained in this order. The aeronautical and environmental processes for SUA proposals involve some overlap and the actions taken, or modifications made, to the proposal in one process may affect the actions required and/or the outcome of the other process.

2. BACKGROUND.

a. The SUA program is designed to accommodate national security requirements and military training activities wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations.

b. SUA proposals are subject to both NEPA and aeronautical processing requirements. Since the FAA is the approval authority for SUA actions, the agency cannot make a final decision on any particular SUA proposal prior to the completion of the NEPA and aeronautical processing phases.

3. POLICIES.

The following policies apply to the processing of SUA proposals:

a. In addition to responsibilities of a cooperating agency as defined in 40 CFR Parts 1500–1508, FAA shall:

1. Provide to DOD information and technical expertise within the special expertise and jurisdiction of the FAA as it relates to the proposed action.

2. Resolve or respond to environmental issues raised during the NEPA process relating to aeronautical issues.

3. If an EA or EIS is required, identify and evaluate the environmental impacts relating to the proposal.

4. Furnish to DOD the names of organizations, agencies, or other parties the FAA believes may be interested in the DOD proposal.

5. Notify and coordinate FAA proposed airspace actions with DOD components that may be affected.

b. FAA Participation in NEPA Meetings. The FAA shall participate in scoping, interagency, and public NEPA meetings conducted by the proponent. The Air Traffic Service Area Director (or the Director's Designee) with responsibility for Cooperating Agency participation will determine FAA representation in the meetings. When FAA personnel participate in such meetings:

1. The audience shall be informed that FAA participation is to provide aeronautical technical expertise and is not to be construed as FAA endorsement or support of any SUA proposal, and that no decisions concerning the proposal will be made at the meeting.

2. If requested, the FAA will provide an overview of the procedures followed by the FAA for processing SUA proposals.

3. The FAA will advise the audience of the Service Area handling the processing of the aeronautical proposal. Additionally, the audience should be advised that written comments on the aeronautical aspects of the proposal should be submitted during the public comment period associated with the aeronautical circularization.

c. FAA NEPA Compliance Options. In accordance with CEQ regulations, the FAA shall participate in the NEPA process as a cooperating agency. The FAA may adopt an EA or EIS prepared by DOD if the FAA independently evaluates the information in the document and takes full responsibility for the scope and content that addresses FAA actions. Where the proponent's NEPA documentation is insufficient, additional NEPA documentation will be required before the FAA can make a final decision. The FAA may ask the applicant to correct any deficiencies and re-submit the assessment if the FAA is not satisfied (see FAAO 1050.1E, "Environmental Impacts: Policies and Procedures," paragraph 203b). The FAA must issue its own FONSI and/or ROD. See FAAO 1050.1E, paragraphs 404d and 518h.

d. Time Limits for Final Environmental Impact Statements (EISs). If three years have expired following the approval of a final EIS, and major steps towards implementation have not commenced, a written reevaluation of the adequacy, accuracy, and validity of the final EIS shall be prepared by the proponent. Written reevaluations must comply with the requirements set forth in FAAO 1050.1E, paragraph 515. The proponent may also elect to prepare new documentation if circumstances dictate.

4. LEAD AND COOPERATING AGENCIES.

The FAA/DOD MOU provides for the application of "lead agency" and "cooperating agency" responsibilities in the SUA environmental process. When the DOD is the proponent, the DOD will serve as lead agency for the evaluation of SUA environmental impacts and the preparation and processing of environmental documents.

a. The DOD, as lead agency, will determine whether an SUA proposal:

1. Is a major action significantly affecting the quality of the human environment requiring an environmental impact statement (EIS);

2. Requires an environmental assessment (EA); or,

3. Is categorically excluded in accordance with FAAO 1050.1E, paragraphs 307 through 311.

These determinations shall be coordinated with the FAA at the earliest possible time to prevent delay in preparation of any required NEPA documentation.

b. The appropriate FAA Service Area, as identified in response to a request to participate, will act as the point of contact for Cooperating Agency status during the evaluation of the proposal's environmental study. FAA may use documents prepared by the proponent in its environmental process, provided the FAA has independently reviewed the scope and content of the documentation and assumes responsibility as described in subparagraph 3c, above. (See FAAO 1050.1E, paragraphs 404d and 518.)

c. Where the actions of one agency are subject to a categorical exclusion and the actions of the other agency with respect to the same SUA is not subject to a categorical exclusion, then the other agency will prepare the appropriate environmental documentation. The applicability of a categorical exclusion to parts of the action will be noted in the environmental document. FAA budget constraints may delay processing and implementation of a proponent's proposal when the categorical exclusion of the proponent is not listed in FAAO 1050.1E, Chapter 3.

5. SUA ENVIRONMENTAL CONCERNS.

In addition to other environmental considerations required under NEPA, CEQ regulations, and FAAO 1050.1E, the following are items the FAA expects to be considered, if applicable, in SUA environmental documents. This list should not be considered all-inclusive:

a. Other Times by NOTAM. When specified in the proposal, this provision permits access to the SUA area 24 hours per day. The environmental document must address the potential impact for use of the SUA during the "other times by NOTAM" period.

b. Flares and Chaff. Address the potential impact of flare and/or chaff use when this activity is specified in the SUA proposal.

c. "No Action Alternative." Include discussion of this alternative.

d. Coastal Zone Consistency Determination. Include if applicable.

e. Proposed Airspace Parameters. The environmental analysis in the EA or EIS for the SUA proposal must match the airspace parameters contained in the SUA proposal (i.e., boundaries, altitudes, times of use, and type and extent of activities).

f. Non-participating Aircraft. Include a discussion of the effect of the SUA proposed action on non-participating aircraft, if applicable.

g. Mitigation. As defined in CEQ regulations, mitigation includes:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
5. Compensating for the impact by replacing or providing substitute resources or environments.

h. Cumulative Impacts. Cumulative impacts on the environment are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal and Non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

i. Consultation. Consultation shall be conducted in accordance with the National Historic Preservation Act, Section 106; the Endangered Species Act, Section 7; FAAO 1210.20 "American Indian and Alaska Native Tribal Consultation Policy and Procedures," and other applicable laws, regulations, and Department of Transportation and FAA Orders.

6. INTERAGENCY SUA ENVIRONMENTAL PLANNING MEETING.

To facilitate early coordination between the FAA and the DOD proponent, the DOD proponent shall make a request to the FAA for Cooperating Agency status as soon as the proponent decides to initiate the environmental process.

When the FAA is invited to participate as a cooperating agency, it is suggested that a planning meeting be held as soon as practical. The agenda of the meeting should be based on the type of SUA proposal, the extent of the planned environmental analysis.

a. The appropriate Regional Military Representative (Milrep) will coordinate the proponent's request for a planning meeting with the appropriate Service Area Director (or their designee). Representatives of the FAA, the proponent, and the proponent's NEPA consultant, if any, should be invited to participate by the military representative.

b. The meeting should include discussion of pertinent issues, including but not limited to:

1. The type of SUA proposal to be submitted,
2. Identification of points-of-contact and establishment of liaison between concerned parties,
3. Determination of the appropriate type of environmental documentation,
4. The appropriate extent of FAA participation,
5. Identification of potentially significant impacts,
6. Consideration of the need for scoping, interagency, and/or other public meetings,
7. Setting processing milestones,
8. Clarifying any questions the proponent may have regarding the FAA's requirements for the environmental analysis and documentation; and,
9. Exchange of information on any environmental and/or aeronautical concerns in the area of potential effect.

c. At the meeting, the Service Area airspace representative should:

1. Brief attendees on the airspace processing procedures in Part 5. of this order that will apply to the SUA proposal.

2. Encourage the proponent to work proactively with aviation user groups and individuals to address aeronautical issues as they arise. This should ensure early consideration of aeronautical mitigation.

d. At the meeting, the Service Area environmental representative should:

1. Brief attendees on the environmental processing procedures in FAAO 1050.1E and Chapter 32 of this order that apply to the SUA proposal.

2. Encourage the proponent to work proactively with other Federal, State, and Local agencies; Tribal Governments; and the public on environmental concerns as they arise. This will ensure that mitigation to address environmental concerns is considered early in the process.

3. Advise attendees that the FAA cannot render a final determination on the environmental effects of the SUA proposal until after completion of the proponent's environmental process, the FAA's aeronautical process, the FAA's independent review of the proponent's environmental documentation, and any additional environmental analyses conducted by the FAA.

e. The meeting format may be tailored to the needs of the specific proposal. It may be conducted by a teleconference, if permitted by the scope of the proposal or if necessary due to funding or other constraints.

f. Additional meetings should be scheduled as needed to discuss changes, revise milestones, share updated environmental and/or aeronautical impact data or public comments, discuss alteration of the proposal in order to mitigate valid aeronautical objections, incorporate agreements by the proponent to mitigate environmental impacts, or discuss other matters.

7. RELATIONSHIPS AND TIMING OF ENVIRONMENTAL AND AERONAUTICAL PROCESSES.

a. SUA proposals are subject to both environmental and aeronautical processing requirements. These processes are separate but closely related. Any actions by a proponent to mitigate environmental impacts, and/or changes to the proposal to address valid aeronautical objections, may alter the type and extent of environmental analysis required.

b. Normally, the SUA proponent will initiate the environmental process well in advance of submitting an actual SUA proposal to the FAA for review. The appropriate Milrep should inform the appropriate Service Area as soon as possible after receiving notice that a DOD proponent plans to initiate the environmental study process. A letter requesting FAA participation in the environmental study process as a Cooperating Agency should be forwarded to the Director of the Office of System Operations Airspace and Aeronautical Information Management (AIM), at FAA Headquarters.

c. Proponents should submit SUA proposals to the FAA Service Area prior to completion of the NEPA process. This will enable the FAA to initiate the aeronautical processing phase prior to completion of any required NEPA documents, which will facilitate the earlier consideration of aeronautical factors that may result in modification of the proposal and may affect the environmental analysis. In all cases, the FAA will defer a final decision on the proposal until the required NEPA process is completed.

d. During the aeronautical processing of a proposal with alternatives, only the alternative submitted to the FAA in accordance with Part 5. of this order will be subjected to the aeronautical process described in this order (i.e., non-rulemaking circularization or Notice of Proposed Rulemaking (NPRM)) by the FAA. However, all reasonable alternatives, including the alternative of no action, must be evaluated in the environmental document.

8. SERVICE AREA PROCEDURES.

a. Normally, FAA participation in the SUA environmental process will begin at the headquarters level with a request by the proponent of an SUA proposal for the FAA to participate in the process as a Cooperating Agency. However, the FAA point of contact will generally be a representative from the Air Traffic Organization at the Service Area level. Close coordination is required between the Service Area Airspace Specialist and Environmental Specialist throughout the process. This will ensure that FAA concerns are provided to the proponent for consideration, and that NEPA and DOT/FAA environmental requirements are met.

b. Once notified of the initiation of the environmental process by the SUA proponent, the Service Area environmental specialist should request that the proponent provide a minimum of five copies of all preliminary, draft, and final environmental documents for FAA review. The Service Area environmental specialist will forward three copies of the documents to FAA Headquarters (System Operations Airspace and AIM, Airspace and Rules or Environmental Programs Groups).

c. To the extent practicable, the Service Area should provide FAA representation at pre-scoping, scoping, and/or other NEPA public meetings concerning the SUA proposal. If requested by the Service Area, representation from the headquarters Airspace and Rules and/or Environmental Programs Groups will be provided.

d. Service Area Airspace Specialist Responsibilities:

1. Coordinate requests from the Milrep to schedule an interagency SUA environmental planning meeting with the Service Area Director (or the Director's designee) and the environmental specialist.

2. Participate in interagency SUA environmental planning meetings as directed, by the Service Area Director (or the Director's designee). (See paragraph 6, above.)

3. Participate in pre-scoping, scoping and/or other public meetings as directed.

4. Provide information and assistance as required to the proponent regarding the aeronautical aspects of the proposal and processing procedures under Part 5. of this order.

5. Coordinate with and assist the environmental specialist in the review of environmental documents to ensure consideration of pertinent aeronautical issues. Compare the SUA proposal parameters with the analysis in the environmental document to ensure that the analysis is consistent with the proponent's airspace request. Provide corrections and/or comments to the environmental specialist for transmittal to the proponent.

6. Maintain liaison with the proponent's environmental team to determine if any comments received pertain to aeronautical issues; provide information regarding the aeronautical aspects of alternatives developed by the proponent.

7. Provide to the proponent aeronautical impact information obtained from the formal aeronautical study conducted in accordance with Chapter 21 of this order and during the aeronautical public comment period. As required, negotiate with the proponent to modify the proposal to mitigate valid aeronautical objections or adverse aeronautical impact.

8. Upon receipt of the SUA proposal, initiate processing in accordance with Part 5. of this order.

(a). Determine if an Informal Airspace Meeting will be held in accordance with the procedures in Part 5. of this order. If a meeting is planned, request participation by the proponent to explain and answer questions about the proposal.

Note:
Informal Airspace Meetings are optional for SUA proposals. Normally, they are held only if the Service Area determines that there is a need to obtain additional aeronautical facts and information relevant to the SUA proposal under study. Informal airspace meetings may also be held based on known or anticipated controversy of the proposal.

(b). Complete the appropriate rulemaking or non-rulemaking processing requirements as defined in Part 5. of this order.

9. In consultation with the Service Area environmental specialist and the Regional Counsel, review the proponent's decision document to ensure that it is consistent with any modifications made to the SUA proposal, if applicable, and that any agreed upon aeronautical mitigation measures are included.

10. If the Service Area airspace specialist recommends approval of the SUA proposal, submit the completed proposal package to the Airspace and Rules Group for final review and determination. The Environmental Programs Group will receive the SUA package from the Airspace and Rules Group for review of any environmental documentation.

e. Service Area Environmental Specialist Responsibilities.

1. Coordinate as required with the Service Area Airspace Specialist regarding SUA matters.

2. Notify the Environmental Programs Group when informed of scheduled interagency SUA environmental planning meetings. Participate in such meetings as directed by the Service Area Director (or the Director's designee) (see paragraph 6 above).

3. Provide information as required to the SUA proponent regarding FAA environmental requirements and concerns.

4. In coordination with the Service Area Airspace Specialist, review the SUA proponent's environmental documents to ensure that applicable impact categories and any specific FAA environmental concerns are considered. After each review, forward any corrections and FAA comments to the proponent.

5. Review the proponent's final document to assess whether it meets the standards for an adequate document under NEPA, the CEQ regulations, DOT Order 5610.1C, and FAAO 1050.1E. Following consultation with the Regional Counsel, determine if the FAA considers the document adequate for adoption. Provide documentation of the results of this review and a recommendation regarding FAA adoption to the Environmental Programs Group.

6. If the proponent takes the position that a categorical exclusion (CATEX) applies to an SUA proposal:

(a). Determine if FAA Order 1050.1E, Chapter 3, Advisory and Emergency Actions and Categorical Exclusions, lists the CATEX. Verify that no extraordinary circumstances exist that would preclude use of the CATEX for the SUA proposal. Determine what additional environmental analysis would be required if the CATEX is not listed.

(b). Document the results of the review in subparagraphs (a) and (b) above, and submit the findings to the Environmental Programs Group.

7. Retain the administrative record in accordance with FAA retention guidelines. If DOD is the lead agency for the proposed project, a copy of relevant documents in its administrative record should be obtained and included in the FAA record.

9. SYSTEM OPERATIONS AIRSPACE and AIM, ENVIRONMENTAL PROGRAMS GROUP PROCEDURES:

a. Review the proponent's environmental document(s) to verify that the analysis matches the parameters specified in the SUA aeronautical proposal and that any required environmental issues are considered. Conduct this review simultaneously with the Service Area's review as described in paragraph 8. Provide corrections and identify deficiencies to the Service Area Airspace and/or Environmental Specialist for transmittal to the proponent.

b. The Environmental Programs Group shall review the proponent's environmental documents for content and compliance with NEPA, CEQ regulations, and applicable DOT and FAA Orders. Coordinate with the Airspace and Rules Group as needed, regarding concerns, corrections, or other comments on aeronautical

impacts. Provide FAA Headquarters comments to the Service Area Environmental Specialist for transmittal to the proponent.

c. Provide concurrent assistance and policy guidance regarding SUA environmental processing to the Service Area environmental specialist upon request.

d. Coordinate with the Airspace and Rules Group as needed for additional information concerning the SUA proposal and aeronautical impact matters.

e. Review the proponent's Final EIS or EA/Finding of No Significant Impact (FONSI), and the Service Area environmental specialists' comments regarding compliance with NEPA, CEQ, and applicable DOT and FAA requirements. Determine if the document is suitable for adoption by the FAA. Prepare FAA adoption memorandum and provide a copy to the Airspace and Rules Group for inclusion in the airspace docket or case file.

f. Review the proponent's and Service Area environmental specialist's comments regarding applicability of a categorical exclusion. If the categorical exclusion does not apply, determine if additional environmental analysis is required. Consider if categorical exclusion documentation is required in accordance with FAAO 1050.1E, Paragraph 305. Provide a copy of the determination to Airspace and Rules Group for inclusion in the airspace docket or case file.

g. As appropriate, coordinate with the FAA Office of the Chief Counsel, Airports and Environmental Law Division. See, e.g. FAAO 1050.1E paragraphs 214d, 304i, 404e, 508a, and 509a.

h. Prepare a separate FAA FONSI and/or Record of Decision (ROD) if circumstances dictate. Provide a copy to the Airspace and Rules Group for inclusion in the airspace docket or case file.

i. In the case of rulemaking SUA actions, assist the Airspace and Rules Group by preparing the statement to be included in the ENVIRONMENTAL REVIEW sections of the NPRM and the Final Rule. In the case of non-rulemaking SUA actions, prepare the FONSI/ROD for the airspace case file for the non-rulemaking documentation and notify the public in accordance with FAA Order 1050.1E, Paragraph 512e.

10. SYSTEM OPERATIONS AIRSPACE and AIM, AIRSPACE AND RULES GROUP PROCEDURES:

a. Upon receipt at headquarters, review the proponent's environmental document(s) from an airspace/aeronautical impact perspective to verify that the environmental analysis matches the parameters specified in the SUA proposal and that any required aeronautical issues are considered. Conduct this review simultaneously with the Service Area aeronautical review as described in paragraph 8, above.

b. Ensure that the Service Area airspace specialist provided a copy of the proposal, including any environmental documentation, to the Service Area environmental specialist.

c. Coordinate with the Environmental Programs Group, as required, to discuss the environmental analysis of the proposal.

d. Submit all SUA NPRMs, final rules, and non-rulemaking airspace determinations to the Environmental Programs Group for coordination prior to issuance.

e. Insert the following statement in the environmental review section of SUA NPRMs:

> "This proposal will be subject to appropriate environmental impact analysis by the FAA prior to any final FAA regulatory action."

f. Consult with the Environmental Programs Group to draft the text for the ENVIRONMENTAL REVIEW section for SUA final rules. In the case of rulemaking SUA actions, assist the Airspace and Rules Group by preparing the statement to be included in the ENVIRONMENTAL REVIEW sections of the NPRM and the Final Rule. In the case of non-rulemaking SUA actions, prepare the FONSI/ROD for the airspace case file for the non-rulemaking documentation and notify the public in accordance with FAAO 1050.1E, Paragraph 512e.

Note:
For "Direct-to-Final-Rule" actions which are categorically excluded under FAAO 1050.1E, the following statement may be inserted in the environmental review section of the Final Rule:

> "This action is categorically excluded under FAAO 1050.1E, "Environmental Impacts: Policies and Procedures," Paragraph (insert Paragraph Number). Therefore, this action is not subject to environmental review."

g. Coordinate with the Environmental Programs Group to determine the status of FAA adoption of the proponent's environmental document(s). Obtain a copy of FAA adoption documentation for inclusion in the rulemaking docket file or non-rulemaking airspace case file.

h. Complete final airspace processing requirements in accordance withPart 5. of this order, including the final determination on the airspace request. In all cases the FAA must not issue a final decision until after the NEPA process is completed; the FAA has adopted the proponent's EIS or EA, as applicable; and any additional FAA environmental requirements are satisfied.

Appendix 9. Noise Policy for Management of Airspace Over Federally Managed Lands

NOISE POLICY FOR MANAGEMENT OF AIRSPACE OVER FEDERALLY MANAGED LANDS

The FAA shares the national concern for the preservation of the natural environment. A critical objective in the FAA Strategic Plan is to provide leadership in mitigating the environmental impact of aviation. It is the policy of the FAA in its management of the navigable airspace over locations in national parks and other federally managed areas with unique noise-sensitive values to exercise leadership in achieving an appropriate balance between efficiency, technological practicability, and environmental concerns, while maintaining the highest level of safety. This policy envisions joint efforts between the FAA and the Federal agencies managing these locations to enhance the compatibility between management of the airspace and the management goals of these agencies.

The National Park System and other natural resource management areas under Federal jurisdiction include many locations with unique values which merit special environmental protection. Some areas provide opportunities for solitude and natural quiet and allow visitors to experience nature unaffected by civilization. Some provide opportunities for people to visit historically authentic settings, as they existed before the introduction of mechanized power. Others contain designated wilderness, critical habitat for endangered species, or solemnity of purpose, which would be diminished by the intrusion of noise. While aircraft noise is not the only noise or environmental impact that may be incompatible with areas having such unique values, this is the area of FAA's special expertise and jurisdiction.

In order to carry out the policy effectively, FAA staff and management will-

- Promote public participation to increase understanding and gain the cooperation of concerned parties when assessing noise impacts on designated locations in federally managed areas. An appropriate public process will be designated for each assessment to identify the stakeholders and provide for their effective participation.
- Communicate this policy to all stakeholders clearly. Educational information will be developed and disseminated to airspace users and other stakeholders, and appropriate advisories will be issued to minimize overflight activity and noise over particularly sensitive locations. A measured and balanced approach to the need for protective measures over specific unique locations will be taken in consultation with Federal agencies administering these areas.
- Consult actively with other Federal agencies to identify and mitigate appropriately aircraft noise levels that are not compatible with designated locations in federally managed areas. Such consultation will ensure that any resulting mitigation strategies will not transfer impacts to other noise-sensitive locations within or beyond the federally managed area. The FAA will evaluate appropriate airspace management options in consultation with the Federal agencies administering these resources to identify particular locations of concern on a priority basis. Such evaluation of alternatives will ensure that safety is not derogated and that technological and economic factors are weighed consistent with the FAA's responsibilities under 49 USC §§40101-46507 (former Federal Aviation Act).
- Develop or refine on a continuing basis methods and criteria to assess aircraft noise on designated locations in federally managed areas, in conjunction with the Federal Interagency Committee on

Aviation Noise (FICAN). Recognizing the lack of complete information and agreement on noise methodology, metrics, noise effects on animals, and appropriate land use compatibility criteria for uniquely quiet areas, the FAA in conjunction with the FICAN will continue to develop, refine, and reach more effectively aircraft noise impacts on unique national land and water resources.

- Train FAA airspace management personnel on effective airspace design techniques for mitigation of adverse aviation impacts on designated locations in federally managed areas.

This policy statement and the underlying actions are consistent with the goals of environmental responsibility and communication in the FAA's Strategic Plan, which state that FAA will:

- Provide strong leadership regarding the environmental impacts of aviation and commercial space transportation.
- Establish and maintain lines of communication with the public and with employees to promote understanding, awareness, and cooperation and to serve the interests of the traveling public.

Signed by

David Hinson

Administrator

Dated November 8, 1996

APPENDIX B
POTENTIAL TRANSIENT AIRCRAFT

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FACT SHEET

U.S. Air Force Fact Sheet

A-10 THUNDERBOLT II

Mission

The A-10 Thunderbolt II has excellent maneuverability at low air speeds and altitude, and is an highly accurate weapons-delivery platform. The aircraft can loiter near battle areas for extended periods of time and operate under 1,000-foot ceilings (303.3 meters) with 1.5-mile (2.4 kilometers) visibility. The wide combat radius and short takeoff and landing capability permit operations in and out of locations near front lines. Using night vision goggles, A-10 pilots can conduct their missions during darkness.

The Thunderbolt IIs have Night Vision Imaging Systems, or NVIS, goggle compatible single-seat cockpits forward of their wings and a large bubble canopy which provides pilots all-around vision. The pilots are protected by titanium armor that also protects parts of the flight-control system. The redundant primary structural sections allow the aircraft to enjoy better survivability during close air support than did previous aircraft.

The aircraft can survive direct hits from armor-piercing and high explosive projectiles up to 23mm. Their self-sealing fuel cells are protected by internal and external foam. Manual systems back up their redundant hydraulic flight-control systems. This permits pilots to fly and land when hydraulic power is lost.

The Thunderbolt II can be serviced and operated from bases with limited facilities near battle areas. Many of the aircraft's parts are interchangeable left and right, including the engines, main landing gear and vertical stabilizers.

Avionics equipment includes multi-band communications; Global Positioning System and inertial navigations systems; infrared and electronic countermeasures against air-to-air and air-to-surface threats. And, it has a Pave Penny laser spot tracker system; a heads-up display to display flight and weapons delivery information; and a low altitude safety and targeting enhancement system, which provides constantly computed impact and release points for accurate ordnance delivery. There is also a low-altitude autopilot and a ground collision avoidance system.

The A-10 is currently undergoing the precision engagement modification, which adds upgraded cockpit displays, moving map, hands on throttle and stick, digital stores management, LITENING and Sniper advanced targeting pod integration, situational awareness data link or SADL, variable message format, or VMF, GPS-guided weapons, and upgraded DC power. Precision engagement modified aircraft are designated as the A-10C.

The Thunderbolt II can employ a wide variety of conventional munitions, including general purpose bombs, cluster bomb units, laser guided bombs, joint direct attack munitions or JDAM), wind corrected munitions dispenser or WCMD, AGM-65 Maverick and AIM-9 Sidewinder

missiles, rockets, illumination flares, and the GAU-8/A 30mm cannon, capable of firing 3,900 rounds per minute to defeat a wide variety of targets including tanks.

Background
The first production A-10A was delivered to Davis-Monthan Air Force Base, Ariz., in October 1975. It was designed specially for the close air support mission and had the ability to combine large military loads, long loiter and wide combat radius, which proved to be vital assets to the United States and its allies during Operation Desert Storm and Operation Noble Anvil.

The upgraded A-10C reached initial operation capability in September 2007. Specifically designed for close air support, its combination of large and varied ordnance load, long loiter time, accurate weapons delivery, austere field capability, and survivability has proven invaluable to the United States and its allies. The aircraft has participated in operations Desert Storm, Southern Watch, Provide Comfort, Desert Fox, Noble Anvil, Deny Flight, Deliberate Guard, Allied Force, Enduring Freedom and Iraqi Freedom.

General Characteristics
Primary Function: A-10 -- close air support, A-10C - airborne forward air control
Contractor: Fairchild Republic Co.
Power Plant: Two General Electric TF34-GE-100 turbofans
Thrust: 9,065 pounds each engine
Wingspan: 57 feet, 6 inches (17.42 meters)
Length: 53 feet, 4 inches (16.16 meters)
Height: 14 feet, 8 inches (4.42 meters)
Weight: 29,000 pounds (13,154 kilograms)
Maximum Takeoff Weight: 51,000 pounds (22,950 kilograms)
Fuel Capacity: 11,000 pounds (7,257 kilograms)
Payload: 16,000 pounds (7,257 kilograms)
Speed: 420 miles per hour (Mach 0.56)
Range: 800 miles (695 nautical miles)
Ceiling: 45,000 feet (13,636 meters)
Armament: One 30 mm GAU-8/A seven-barrel Gatling gun; up to 16,000 pounds (7,200 kilograms) of mixed ordnance on eight under-wing and three under-fuselage pylon stations, including 500 pound (225 kilograms) Mk-82 and 2,000 pounds (900 kilograms) Mk-84 series low/high drag bombs, incendiary cluster bombs, combined effects munitions, mine dispensing munitions, AGM-65 Maverick missiles and laser-guided/electro-optically guided bombs; infrared countermeasure flares; electronic countermeasure chaff; jammer pods; 2.75-inch (6.99 centimeters) rockets; illumination flares and AIM-9 Sidewinder missiles.
Crew: One
Unit Cost: Not available
Initial operating capability: A-10A, 1977; A-10C, 2007
Inventory: Active force, A-10, 143 and A-10C, 70; Reserve, A-10, 46 and OA-10, 6; ANG, A-10, 84 and OA-10, 18

Point of Contact
Air Combat Command, Public Affairs Office; 130 Andrews St., Suite 202; Langley AFB, VA 23665-1987; DSN 574-5007 or 757-764-5007; e-mail: accpa.operations@langley.af.mil

FACT SHEET

U.S. Air Force Fact Sheet

B-1B LANCER

Mission

Carrying the largest payload of both guided and unguided weapons in the Air Force inventory, the multi-mission B-1 is the backbone of America's long-range bomber force. It can rapidly deliver massive quantities of precision and non-precision weapons against any adversary, anywhere in the world, at any time.

Features

The B-1B's blended wing/body configuration, variable-geometry wings and turbofan afterburning engines, combine to provide long range, maneuverability and high speed while enhancing survivability. Forward wing settings are used for takeoff, landings, air refueling and in some high-altitude weapons employment scenarios. Aft wing sweep settings - the main combat configuration -- are typically used during high subsonic and supersonic flight, enhancing the B-1B's maneuverability in the low- and high-altitude regimes. The B-1B's speed and superior handling characteristics allow it to seamlessly integrate in mixed force packages. These capabilities, when combined with its substantial payload, excellent radar targeting system, long loiter time and survivability, make the B-1B a key element of any joint/composite strike force.

The B-1 is a highly versatile, multi-mission weapon system. The B-1B's synthetic aperture radar is capable of tracking, targeting and engaging moving vehicles as well as self-targeting and terrain-following modes. In addition, an extremely accurate Global Positioning System-aided Inertial Navigation System enables aircrews to navigate without the aid of ground-based navigation aids as well as engage targets with a high level of precision. The Combat Track II radios provide a secure beyond line of sight reach back connectivity until Link-16 is integrated on the aircraft. In a time sensitive targeting environment, the aircrew can use targeting data from the Combined Air Operations Center over Combat Track II, then to strike emerging targets rapidly and efficiently. This capability was effectively demonstrated during operations Enduring Freedom and Iraqi Freedom.

The B-1B's onboard self-protection electronic jamming equipment, radar warning receiver (ALQ-161) and expendable countermeasures (chaff and flare) system and a towed decoy system (ALE-50) complements its low-radar cross-section to form an integrated, robust defense system that supports penetration of hostile airspace. The ALQ-161 electronic countermeasures system detects and identifies the full spectrum of adversary threat emitters then applies the appropriate jamming technique either automatically or through operator inputs.

Current modifications build on this foundation. Radar sustainability and capability upgrades will provide a more reliable system and may be upgraded in the future to include an ultra high-resolution capability and automatic target recognition. The addition of a fully integrated data link, or FIDL, will add Link-16 communications capability. FIDL combined with associated cockpit upgrades will provide the crew with a much more flexible, integrated cockpit, and will

allow the B-1 to operate in the fast-paced integrated battlefield of the future. Several obsolete and hard to maintain electronic systems are also being replaced to improve aircraft reliability.

Background
The B-1A was initially developed in the 1970s as a replacement for the B-52. Four prototypes of this long-range, high speed (Mach 2.2) strategic bomber were developed and tested in the mid-1970s, but the program was canceled in 1977 before going into production. Flight testing continued through 1981.

The B-1B is an improved variant initiated by the Reagan administration in 1981. Major changes included the addition of additional structure to increase payload by 74,000 pounds, an improved radar and reduction of the radar cross section by an order of magnitude. The inlet was extensively modified as part of this RCS reduction, necessitating a reduction in maximum speed to Mach 1.2.

The first production B-1 flew in October 1984, and the first B-1B was delivered to Dyess Air Force Base, Texas, in June 1985. Initial operational capability was achieved on Oct. 1, 1986. The final B-1B was delivered May 2, 1988.

The B-1B holds almost 50 world records for speed, payload, range, and time of climb in its class. The National Aeronautic Association recognized the B-1B for completing one of the 10 most memorable record flights for 1994. The most recent records were made official in 2004.

The B-1B was first used in combat in support of operations against Iraq during Operation Desert Fox in December 1998. In 1999, six B-1s were used in Operation Allied Force, delivering more than 20 percent of the total ordnance while flying less than 2 percent of the combat sorties.

During the first six months of Operation Enduring Freedom, eight B-1s dropped nearly 40 percent of the total tonnage delivered by coalition air forces. This included nearly 3,900 JDAMs, or 67 percent of the total. In Operation Iraqi Freedom, the aircraft has flown less 1 percent of the combat missions while delivering 43 percent of the JDAMs used. The B-1 continues to be deployed today, flying missions daily in suppport of continuing oerations.

General Characteristics
Primary Function: Long-range, multi-role, heavy bomber
Contractor: Boeing, North America (formerly Rockwell International, North American Aircraft); Offensive avionics, Boeing Military Airplane; defensive avionics, EDO Corporation
Power plant: Four General Electric F101-GE-102 turbofan engine with afterburner
Thrust: 30,000-plus pounds with afterburner, per engine
Wingspan: 137 feet (41.8 meters) extended forward, 79 feet (24.1 meters) swept aft
Length: 146 feet (44.5 meters)
Height: 34 feet (10.4 meters)
Weight: approximately 190,000 pounds (86,183 kilograms)
Maximum Takeoff Weight: 477,000 pounds (216,634 kilograms)
Fuel Capacity: 265,274 pounds (120,326 kilograms)
Payload: 75,000 pounds (34,019 kilograms)
Speed: 900-plus mph (Mach 1.2 at sea level)
Range: Intercontinental
Ceiling: More than 30,000 feet (9,144 meters)
Armament: 84 500-pound Mk-82 or 24 2,000-pound Mk-84 general purpose bombs; up to 84 500-pound Mk-62 or 8 2,000-pound Mk-65 Quick Strike naval mines; 30 cluster munitions (CBU-87, -89, -97) or 30 Wind-Corrected Munitions Dispensers (CBU-103, -104, -105); up to 24 2,000-pound GBU-31 or 15 500-pound GBU-38 Joint Direct Attack Munitions; up to 24 AGM-158A Joint Air-to-Surface Standoff Missiles
Crew: Four (aircraft commander, copilot, and two weapon systems officers)
Unit Cost: $283.1 million (fiscal 98 constant dollars)
Initial operating capability: October 1986
Inventory: Active force, 66 (test, 2); ANG, 0; Reserve, 0

Point of Contact

Air Combat Command, Public Affairs Office; 130 Andrews St., Suite 202; Langley AFB, VA 23665-1987; DSN 574-5007 or 757-764-5007; e-mail: accpa.operations@langley.af.mil

FACT SHEET

U.S. Air Force Fact Sheet

B-2 SPIRIT

Mission

The B-2 Spirit is a multi-role bomber capable of delivering both conventional and nuclear munitions. A dramatic leap forward in technology, the bomber represents a major milestone in the U.S. bomber modernization program. The B-2 brings massive firepower to bear, in a short time, anywhere on the globe through previously impenetrable defenses.

Features

Along with the B-52, the B-2 provides the penetrating flexibility and effectiveness inherent in manned bombers. Its low-observable, or "stealth," characteristics give it the unique ability to penetrate an enemy's most sophisticated defenses and threaten its most valued, and heavily defended, targets. Its capability to penetrate air defenses and threaten effective retaliation provides a strong, effective deterrent and combat force well into the 21st century.

The revolutionary blending of low-observable technologies with high aerodynamic efficiency and large payload gives the B-2 important advantages over existing bombers. Its low-observability provides it greater freedom of action at high altitudes, thus increasing its range and a better field of view for the aircraft's sensors. Its unrefueled range is approximately 6,000 nautical miles (9,600 kilometers).

The B-2's low observability is derived from a combination of reduced infrared, acoustic, electromagnetic, visual and radar signatures. These signatures make it difficult for the sophisticated defensive systems to detect, track and engage the B-2. Many aspects of the low-observability process remain classified; however, the B-2's composite materials, special coatings and flying-wing design all contribute to its "stealthiness."

The B-2 has a crew of two pilots, a pilot in the left seat and mission commander in the right, compared to the B-1B's crew of four and the B-52's crew of five.

Background

The first B-2 was publicly displayed on Nov. 22, 1988, when it was rolled out of its hangar at Air Force Plant 42, Palmdale, Calif. Its first flight was July 17, 1989. The B-2 Combined Test Force, Air Force Flight Test Center, Edwards Air Force Base, Calif., is responsible for flight testing the engineering, manufacturing and development aircraft on the B-2.

Whiteman AFB, Mo., is the only operational base for the B-2. The first aircraft, Spirit of Missouri, was delivered Dec. 17, 1993. Depot maintenance responsibility for the B-2 is performed by Air Force contractor support and is managed at the Oklahoma City Air Logistics Center at Tinker AFB, Okla.

The combat effectiveness of the B-2 was proved in Operation Allied Force, where it was responsible for destroying 33 percent of all Serbian targets in the first eight weeks, by flying

nonstop to Kosovo from its home base in Missouri and back. In support of Operation Enduring Freedom, the B-2 flew one of its longest missions to date from Whiteman to Afghanistan and back. The B-2 completed its first-ever combat deployment in support of Operation Iraqi Freedom, flying 22 sorties from a forward operating location as well as 27 sorties from Whiteman AFB and releasing more than 1.5 million pounds of munitions. The aircraft received full operational capability status in December 2003. On Feb. 1, 2009, the Air Force's newest command, Air Force Global Strike Command, assumed responsibility for the B-2 from Air Combat Command.

The prime contractor, responsible for overall system design and integration, is Northrop Grumman Integrated Systems Sector. Boeing Military Airplanes Co., Hughes Radar Systems Group, General Electric Aircraft Engine Group and Vought Aircraft Industries, Inc., are key members of the aircraft contractor team.

General Characteristics
Primary function: Multi-role heavy bomber
Contractor: Northrop Grumman Corp. and **Contractor Team:** Boeing Military Airplanes Co., Hughes Radar Systems Group, General Electric Aircraft Engine Group and Vought Aircraft Industries, Inc.
Power Plant: Four General Electric F118-GE-100 engines
Thrust: 17,300 pounds each engine
Wingspan: 172 feet (52.12 meters)
Length: 69 feet (20.9 meters)
Height: 17 feet (5.1 meters
Weight: 160,000 pounds (72,575 kilograms)
Maximum Takeoff Weight: 336,500 pounds (152,634 kilograms)
Fuel Capacity: 167,000 pounds (75750 kilograms)
Payload: 40,000 pounds (18,144 kilograms)
Speed: High subsonic
Range: Intercontinental
Ceiling: 50,000 feet (15,240 meters)
Armament: Conventional or nuclear weapons
Crew: Two pilots
Unit cost: Approximately $1.157 billion (fiscal 98 constant dollars)
Initial operating capability: April 1997
Inventory: Active force: 20 (1 test); ANG: 0; Reserve: 0

Point of Contact
Air Force Global Strike Command , Public Affairs Office; 245 Davis Ave. E, Room 240; Barksdale AFB, LA 71110; DSN 781-0854/0819; commercial 318-456-0854/0819; afgsc.pa@barksdale.af.mil.

FACT SHEET

U.S. Air Force Fact Sheet

B-52 STRATOFORTRESS

Mission

The B-52 is a long-range, heavy bomber that can perform a variety of missions. The bomber is capable of flying at high subsonic speeds at altitudes up to 50,000 feet (15,166.6 meters). It can carry nuclear or precision guided conventional ordnance with worldwide precision navigation capability.

Features

In a conventional conflict, the B-52 can perform strategic attack, close-air support, air interdiction, offensive counter-air and maritime operations. During Desert Storm, B-52s delivered 40 percent of all the weapons dropped by coalition forces. It is highly effective when used for ocean surveillance, and can assist the U.S. Navy in anti-ship and mine-laying operations. Two B-52s, in two hours, can monitor 140,000 square miles (364,000 square kilometers) of ocean surface.

All B-52s are equipped with two electro-optical viewing sensors, a forward-looking infrared and advanced targeting pods to augment targeting, battle assessment, and flight safety, thus further improving its combat ability.

Pilots wear night vision goggles, or NVG, to enhance their vision during night operations. Night vision goggles provide greater safety during night operations by increasing the pilot's ability to visually clear terrain, avoid enemy radar and see other aircraft in a lights-out environment.

Starting in 1989, on-going modifications incorporate the global positioning system, heavy stores adapter beams for carrying 2,000 pound munitions, and a full array of advance weapons currently under development.

The use of aerial refueling gives the B-52 a range limited only by crew endurance. It has an unrefueled combat range in excess of 8,800 miles (14,080 kilometers).

Background

For more than 40 years B-52 Stratofortresses have been the backbone of the manned strategic bomber force for the United States. The B-52 is capable of dropping or launching the widest array of weapons in the U.S. inventory. This includes gravity bombs, cluster bombs, precision guided missiles and joint direct attack munitions. Updated with modern technology the B-52 will be capable of delivering the full complement of joint developed weapons and will continue into the 21st century as an important element of our nation's defenses. Current engineering analyses show the B-52's life span to extend beyond the year 2040.

The B-52A first flew in 1954, and the B model entered service in 1955. A total of 744 B-52s were built with the last, a B-52H, delivered in October 1962. The first of 102 B-52H's was delivered to Strategic Air Command in May 1961. The H model can carry up to 20 air launched cruise missiles. In addition, it can carry the conventional cruise missile that was launched in

several contingencies during the 1990s, starting with Operation Desert Storm and culminating with Operation Iraqi Freedom.

The aircraft's flexibility was evident in Operation Desert Storm and again during Operations Allied Force. B-52s struck wide-area troop concentrations, fixed installations and bunkers, and decimated the morale of Iraq's Republican Guard. On Sept. 2 to 3, 1996, two B-52H's struck Baghdad power stations and communications facilities with 13 AGM-86C conventional air launched cruise missiles, or CALCMs, as part of Operation Desert Strike. This mission was the longest distance flown for a combat mission involving a 34-hour, 16,000 statute mile round trip from Barksdale Air Force Base, La.

In 2001, the B-52 contributed to the success in Operation Enduring Freedom, providing the ability to loiter high above the battlefield and provide close air support through the use of precision guided munitions.

The B-52 also played a role in Operation Iraqi Freedom. On March 21, 2003, B-52Hs launched approximately 100 CALCMs during a night mission.

Only the H model is still in the Air Force inventory and is assigned to the 5th Bomb Wing at Minot AFB, N.D. and the 2nd Bomb Wing at Barksdale AFB, La., which fall under Air Force Global Strike Command. The aircraft is also assigned to the Air Force Reserve Command's 917th Wing at Barksdale.

General Characteristics
Primary Function: Heavy bomber
Contractor: Boeing Military Airplane Co.
Power plant: Eight Pratt & Whitney engines TF33-P-3/103 turbofan
Thrust: Each engine up to 17,000 pounds
Wingspan: 185 feet (56.4 meters)
Length: 159 feet, 4 inches (48.5 meters)
Height: 40 feet, 8 inches (12.4 meters)
Weight: Approximately 185,000 pounds (83,250 kilograms)
Maximum Takeoff Weight: 488,000 pounds (219,600 kilograms)
Fuel Capacity: 312,197 pounds (141,610 kilograms)
Payload: 70,000 pounds (31,500 kilograms)
Speed: 650 miles per hour (Mach 0.86)
Range: 8,800 miles (7,652 nautical miles)
Ceiling: 50,000 feet (15,151.5 meters)
Armament: Approximately 70,000 pounds (31,500 kilograms) mixed ordnance -- bombs, mines and missiles. (Modified to carry air-launched cruise missiles)
Crew: Five (aircraft commander, pilot, radar navigator, navigator and electronic warfare officer
Unit Cost: $53.4 million (fiscal 98 constant dollars)
Initial operating capability: April 1952
Inventory: Active force, 85; ANG, 0; Reserve, 9

Point of Contact
Air Force Global Strike Command, Public Affairs Office; 245 Davis Ave. E
Room 230; Barksdale AFB, LA 71110; 318- 456-0854/0819; or DSN 781-0854/0819; e-mail: afgsc.pa@barksdale.af.mil

FACT SHEET

U.S. Air Force Fact Sheet

C-130 HERCULES

Mission

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

Features

Using its aft loading ramp and door the C-130 can accommodate a wide variety of oversized cargo, including everything from utility helicopters and six-wheeled armored vehicles to standard palletized cargo and military personnel. In an aerial delivery role, it can airdrop loads up to 42,000 pounds or use its high-flotation landing gear to land and deliver cargo on rough, dirt strips.

The flexible design of the Hercules enables it to be configured for many different missions, allowing for one aircraft to perform the role of many. Much of the special mission equipment added to the Hercules is removable, allowing the aircraft to revert back to its cargo delivery role if desired. Additionally, the C-130 can be rapidly reconfigured for the various types of cargo such as palletized equipment, floor-loaded material, airdrop platforms, container delivery system bundles, vehicles and personnel or aeromedical evacuation.

The C-130J is the latest addition to the C-130 fleet and will replace aging C-130E's. The C-130J incorporates state-of-the-art technology to reduce manpower requirements, lower operating and support costs, and provides life-cycle cost savings over earlier C-130 models. Compared to older C-130s, the J model climbs faster and higher, flies farther at a higher cruise speed, and takes off and lands in a shorter distance. The C-130J-30 is a stretch version, adding 15 feet to fuselage, increasing usable space in the cargo compartment.

C-130J/J-30 major system improvements include: advanced two-pilot flight station with fully integrated digital avionics; color multifunctional liquid crystal displays and head-up displays; state-of-the-art navigation systems with dual inertial navigation system and global positioning system; fully integrated defensive systems; low-power color radar; digital moving map display; new turboprop engines with six-bladed, all-composite propellers; digital auto pilot; improved fuel, environmental and ice-protection systems; and an enhanced cargo-handling system.

Background
Four decades have elapsed since the Air Force issued its original design specification, yet the remarkable C-130 remains in production. The initial production model was the C-130A, with four Allison T56-A-11 or -9 turboprops. A total of 219 were ordered and deliveries began in December 1956. The C-130B introduced Allison T56-A-7 turboprops and the first of 134 entered Air Force service in May 1959.

Introduced in August of 1962, the 389 C-130E's that were ordered used the same Allison T56-A-7 engine, but added two 1,290 gallon external fuel tanks and an increased maximum takeoff weight capability. June 1974 introduced the first of 308 C-130H's with the more powerful Allison T56-A-15 turboprop engine. Nearly identical to the C-130E externally, the new engine brought major performance improvements to the aircraft.

The latest C-130 to be produced, the C-130J entered the inventory in February 1999. With the noticeable difference of a six-bladed composite propeller coupled to a Rolls-Royce AE2100D3 turboprop engine, the C-130J brings substantial performance improvements over all previous models, and has allowed the introduction of the C-130J-30, a stretch version with a 15-foot fuselage extension. To date, the Air Force has taken delivery of 68 C-130J aircraft from Lockheed Martin Aeronautics Company.

Active-duty locations for the C-130 and its variations are Dyess Air Force Base, Texas; Little Rock AFB, Ark.; Ramstein Air Base, Germany; and Yokota AB, Japan.

Air Force Reserve locations for assigned C-130 models are Dobbins Air Reserve Base, Ga.; Keesler AFB, Miss.; Maxwell AFB, Ala.; Minnesota-St. Paul Joint Air Reserve Station, Minn.; Niagara Falls ARS, N.Y.; Peterson AFB, Colo.; Pittsburgh ARS, Pa.; Pope AFB, N.C. and Youngstown ARS, Ohio.

Air National Guard locations for C-130 and its variations are Baltimore (Martin State Airport), Md.; Boise Air Terminal, Idaho; Joint Reserve Base Carswell, Texas; Channel Island Air National Guard Station, Calif.; Charlotte/Douglas International Airport, N.C.; Cheyenne Municipal Airport, Wyo.; Kulis Air National Guard Base , Alaska; Little Rock AFB, Ark.; Louisville IAP, Ky.; Munoz ANGB, Puerto Rico; Mansfield Lahm Airport, Ohio; Minnesota-St. Paul ARS, Minn.; Nashville IAP, Tenn.; New Castle County ANGB, Del; Greater Peoria Regional Airport, Ill.; Quonset State Airport, R.I.; Reno-Tahoe IAP, Nev.; Savannah IAP, Ga.; Schenectady MAP, N.Y.; Rosecrans Memorial Airport, Mo.; and Yeager Airport, W.V.

General Characteristics
Primary Function: Global airlift
Contractor: Lockheed Martin Aeronautics Company
Power Plant:
C-130E: Four Allison T56-A-7 turboprops; 4,200 prop shaft horsepower
C-130H: Four Allison T56-A-15 turboprops; 4,591prop shaft horsepower
C-130J: Four Rolls-Royce AE 2100D3 turboprops; 4,700 horsepower
Length: C-130E/H/J: 97 feet, 9 inches (29.3 meters)
C-130J-30: 112 feet, 9 inches (34.69 meters)
Height: 38 feet, 10 inches (11. 9 meters)
Wingspan: 132 feet, 7 inches (39.7 meters)
Cargo Compartment:
C-130E/H/J: length, 40 feet (12.31 meters); width, 119 inches (3.12 meters); height, 9 feet (2.74 meters). Rear ramp: length, 123 inches (3.12 meters); width, 119 inches (3.02 meters)
C-130J-30: length, 55 feet (16.9 meters); width, 119 inches (3.12 meters); height, 9 feet (2.74 meters). Rear ramp: length, 123 inches (3.12 meters); width, 119 inches (3.02 meters)
Speed:
C-130E: 345 mph/300 ktas (Mach 0.49) at 20,000 feet (6,060 meters)
C-130H: 366 mph/318 ktas (Mach 0.52) at 20,000 feet (6,060 meters)
C-130J: 417 mph/362 ktas (Mach 0.59) at 22,000 feet (6,706 meters)
C-130J-30: 410 mph/356 ktas (Mach 0.58) at 22,000 feet (6,706 meters)

Ceiling:
C-130J: 28,000 feet (8,615 meters) with 42,000 pounds (19,090 kilograms) payload
C-130J-30: 26,000 feet (8,000 meters) with 44,500 pounds (20,227 kilograms) payload.
C-130H: 23,000 feet (7,077 meters) with 42,000 pounds (19,090 kilograms) payload.
C-130E: 19,000 feet (5,846 meters) with 42,000 pounds (19,090 kilograms) payload
Maximum Takeoff Weight:
C-130E/H/J: 155,000 pounds (69,750 kilograms)
C-130J-30: 164,000 pounds (74,393 kilograms)
Maximum Allowable Payload:
C-130E, 42,000 pounds (19,090 kilograms)
C-130H, 42,000 pounds (19,090 kilograms)
C-130J, 42,000 pounds (19,090 kilograms)
C-130J-30, 44,000 (19,958 kilograms)
Maximum Normal Payload:
C-130E, 36,500 pounds (16,590 kilograms)
C-130H, 36,500 pounds (16,590 kilograms)
C-130J, 34,000 pounds (15,422 kilograms)
C-130J-30, 36,000 pounds (16,329 kilograms)
Range at Maximum Normal Payload:
C-130E, 1,150 miles (1,000 nautical miles)
C-130H, 1,208 miles (1,050 nautical miles)
C-130J, 2,071 miles (1,800 nautical miles)
C-130J-30, 1,956 miles (1,700 nautical miles)
Range with 35,000 pounds of Payload:
C-130E, 1,438 miles (1,250 nautical miles)
C-130H, 1,496 miles (1,300 nautical miles)
C-130J, 1,841 miles (1,600 nautical miles)
C-130J-30, 2,417 miles (2,100 nautical miles)
Maximum Load:
C-130E/H/J: 6 pallets or 74 litters or 16 CDS bundles or 92 combat troops or 64 paratroopers, or a combination of any of these up to the cargo compartment capacity or maximum allowable weight.
C-130J-30: 8 pallets or 97 litters or 24 CDS bundles or 128 combat troops or 92 paratroopers, or a combination of any of these up to the cargo compartment capacity or maximum allowable weight.
Crew: C-130E/H: Five (two pilots, navigator, flight engineer and loadmaster)
C-130J/J-30: Three (two pilots and loadmaster)
Aeromedical Evacuation Role: A basic crew of five (two flight nurses and three medical technicians) is added for aeromedical evacuation missions. Medical crew may be decreased or increased as required by the needs of patients.
Unit Cost: C-130E, $11.9, C-130H, $30.1, C-130J, $48.5 (FY 1998 constant dollars in millions)
Date Deployed: C-130A, Dec 1956; C-130B, May 1959; C-130E, Aug 1962; C-130H, Jun 1974; C-130J, Feb 1999
Inventory: Active force, 145; Air National Guard, 181; Air Force Reserve, 102

Point of Contact
Air Mobility Command, Public Affairs Office; 503 Ward Drive Ste 214, Scott AFB, IL 62225-5335, DSN 779-7821 or 618-229-7821.

FACT SHEET

U.S. Air Force Fact Sheet

F-15 EAGLE

Mission
The F-15 Eagle is an all-weather, extremely maneuverable, tactical fighter designed to permit the Air Force to gain and maintain air supremacy over the battlefield.

Features
The Eagle's air superiority is achieved through a mixture of unprecedented maneuverability and acceleration, range, weapons and avionics. It can penetrate enemy defense and outperform and outfight any current enemy aircraft. The F-15 has electronic systems and weaponry to detect, acquire, track and attack enemy aircraft while operating in friendly or enemy-controlled airspace. The weapons and flight control systems are designed so one person can safely and effectively perform air-to-air combat.

The F-15's superior maneuverability and acceleration are achieved through high engine thrust-to-weight ratio and low wing loading. Low wing-loading (the ratio of aircraft weight to its wing area) is a vital factor in maneuverability and, combined with the high thrust-to-weight ratio, enables the aircraft to turn tightly without losing airspeed.

A multimission avionics system sets the F-15 apart from other fighter aircraft. It includes a head-up display, advanced radar, inertial navigation system, flight instruments, ultrahigh frequency communications, tactical navigation system and instrument landing system. It also has an internally mounted, tactical electronic-warfare system, "identification friend or foe" system, electronic countermeasures set and a central digital computer.

The pilot's head-up display projects on the windscreen all essential flight information gathered by the integrated avionics system. This display, visible in any light condition, provides information necessary to track and destroy an enemy aircraft without having to look down at cockpit instruments.

The F-15's versatile pulse-Doppler radar system can look up at high-flying targets and down at low-flying targets without being confused by ground clutter. It can detect and track aircraft and small high-speed targets at distances beyond visual range down to close range, and at altitudes down to treetop level. The radar feeds target information into the central computer for effective weapons delivery. For close-in dogfights, the radar automatically acquires enemy aircraft, and this information is projected on the head-up display. The F-15's electronic warfare system provides both threat warning and automatic countermeasures against selected threats.

A variety of air-to-air weaponry can be carried by the F-15. An automated weapon system enables the pilot to perform aerial combat safely and effectively, using the head-up display and the avionics and weapons controls located on the engine throttles or control stick. When the pilot changes from one weapon system to another, visual guidance for the required weapon

automatically appears on the head-up display.

The Eagle can be armed with combinations of different air-to-air weapons: AIM-120 advanced medium range air-to-air missiles on its lower fuselage corners, AIM-9L/M Sidewinder or AIM-120 missiles on two pylons under the wings, and an internal 20mm Gatling gun in the right wing root.

The F-15E is a two-seat, dual-role, totally integrated fighter for all-weather, air-to-air and deep interdiction missions. The rear cockpit is upgraded to include four multi-purpose CRT displays for aircraft systems and weapons management. The digital, triple-redundant Lear Siegler flight control system permits coupled automatic terrain following, enhanced by a ring-laser gyro inertial navigation system.

For low-altitude, high-speed penetration and precision attack on tactical targets at night or in adverse weather, the F-15E carries a high-resolution APG-70 radar and low-altitude navigation and targeting infrared for night pods

Background
The first F-15A flight was made in July 1972, and the first flight of the two-seat F-15B (formerly TF-15A) trainer was made in July 1973. The first Eagle (F-15B) was delivered in November 1974. In January 1976, the first Eagle destined for a combat squadron was delivered.

The single-seat F-15C and two-seat F-15D models entered the Air Force inventory beginning in 1979. These new models have Production Eagle Package (PEP 2000) improvements, including 2,000 pounds (900 kilograms) of additional internal fuel, provision for carrying exterior conformal fuel tanks and increased maximum takeoff weight of up to 68,000 pounds (30,600 kilograms).

The F-15 Multistage Improvement Program was initiated in February 1983, with the first production MSIP F-15C produced in 1985. Improvements included an upgraded central computer; a Programmable Armament Control Set, allowing for advanced versions of the AIM-7, AIM-9, and AIM-120A missiles; and an expanded Tactical Electronic Warfare System that provides improvements to the ALR-56C radar warning receiver and ALQ-135 countermeasure set. The final 43 included a Hughes APG-70 radar.

F-15C, D and E models were deployed to the Persian Gulf in 1991 in support of Operation Desert Storm where they proved their superior combat capability. F-15C fighters accounted for 34 of the 37 Air Force air-to-air victories. F-15E's were operated mainly at night, hunting SCUD missile launchers and artillery sites using the LANTIRN system.

They have since been deployed for air expeditionary force deployments and operations Southern Watch (no-fly zone in Southern Iraq), Provide Comfort in Turkey, Allied Force in Bosnia, Enduring Freedom in Afghanistan and Iraqi Freedom in Iraq.

General Characteristics
Primary function: Tactical fighter
Contractor: McDonnell Douglas Corp.
Power plant: Two Pratt & Whitney F100-PW-100, 220 or 229 turbofan engines with afterburners
Thrust: (C/D models) 23,450 pounds each engine
Wingspan: 42.8 feet (13 meters)
Length: 63.8 feet (19.44 meters)
Height: 18.5 feet (5.6 meters)
Weight: 31,700 pounds
Maximum takeoff weight: (C/D models) 68,000 pounds (30,844 kilograms)
Fuel Capacity: 36,200 pounds (three external plus conformal fuel tanks)
Payload: depends on mission
Speed: 1,875 mph (Mach 2 class)
Ceiling: 65,000 feet (19,812 meters)
Range: 3,450 miles (3,000 nautical miles) ferry range with conformal fuel tanks and three

external fuel tanks
Crew: F-15A/C: one. F-15B/D/E: two
Armament: One internally mounted M-61A1 20mm 20-mm, six-barrel cannon with 940 rounds of ammunition; four AIM-9 Sidewinder and four AIM-120 AMRAAMs or eight AIM-120 AMRAAMs, carried externally.
Unit Cost: A/B models - $27.9 million (fiscal 98 constant dollars);**C/D models** - $29.9 million (fiscal 98 constant dollars)
Initial operating capability: September 1975
Inventory: Total force, 522

Point of Contact
Air Combat Command, Public Affairs Office; 130 Andrews St., Suite 213; Langley AFB, VA 23665-1987; DSN 574-5007 or 757-764-5007; e-mail: accpa.operations@langley.af.mil

FACT SHEET

U.S. Air Force Fact Sheet

F-16 FIGHTING FALCON

Mission

The F-16 Fighting Falcon is a compact, multi-role fighter aircraft. It is highly maneuverable and has proven itself in air-to-air combat and air-to-surface attack. It provides a relatively low-cost, high-performance weapon system for the United States and allied nations.

Features

In an air combat role, the F-16's maneuverability and combat radius (distance it can fly to enter air combat, stay, fight and return) exceed that of all potential threat fighter aircraft. It can locate targets in all weather conditions and detect low flying aircraft in radar ground clutter. In an air-to-surface role, the F-16 can fly more than 500 miles (860 kilometers), deliver its weapons with superior accuracy, defend itself against enemy aircraft, and return to its starting point. An all-weather capability allows it to accurately deliver ordnance during non-visual bombing conditions.

In designing the F-16, advanced aerospace science and proven reliable systems from other aircraft such as the F-15 and F-111 were selected. These were combined to simplify the airplane and reduce its size, purchase price, maintenance costs and weight. The light weight of the fuselage is achieved without reducing its strength. With a full load of internal fuel, the F-16 can withstand up to nine G's -- nine times the force of gravity -- which exceeds the capability of other current fighter aircraft.

The cockpit and its bubble canopy give the pilot unobstructed forward and upward vision, and greatly improved vision over the side and to the rear. The seat-back angle was expanded from the usual 13 degrees to 30 degrees, increasing pilot comfort and gravity force tolerance. The pilot has excellent flight control of the F-16 through its "fly-by-wire" system. Electrical wires relay commands, replacing the usual cables and linkage controls. For easy and accurate control of the aircraft during high G-force combat maneuvers, a side stick controller is used instead of the conventional center-mounted stick. Hand pressure on the side stick controller sends electrical signals to actuators of flight control surfaces such as ailerons and rudder.

Avionics systems include a highly accurate enhanced global positioning and inertial navigation systems, or EGI, in which computers provide steering information to the pilot. The plane has UHF and VHF radios plus an instrument landing system. It also has a warning system and modular countermeasure pods to be used against airborne or surface electronic threats. The fuselage has space for additional avionics systems.

Background

The F-16A, a single-seat model, first flew in December 1976. The first operational F-16A was delivered in January 1979 to the 388th Tactical Fighter Wing at Hill Air Force Base, Utah.

The F-16B, a two-seat model, has tandem cockpits that are about the same size as the one in the A model. Its bubble canopy extends to cover the second cockpit. To make room for the second cockpit, the forward fuselage fuel tank and avionics growth space were reduced. During training, the forward cockpit is used by a student pilot with an instructor pilot in the rear cockpit.

All F-16s delivered since November 1981 have built-in structural and wiring provisions and systems architecture that permit expansion of the multirole flexibility to perform precision strike, night attack and beyond-visual-range interception missions. This improvement program led to the F-16C and F-16D aircraft, which are the single- and two-place counterparts to the F-16A/B, and incorporate the latest cockpit control and display technology. All active units and many Air National Guard and Air Force Reserve units have converted to the F-16C/D.

The F-16 was built under an unusual agreement creating a consortium between the United States and four NATO countries: Belgium, Denmark, the Netherlands and Norway. These countries jointly produced with the United States an initial 348 F-16s for their air forces. Final airframe assembly lines were located in Belgium and the Netherlands. The consortium's F-16s are assembled from components manufactured in all five countries. Belgium also provides final assembly of the F100 engine used in the European F-16s. Recently, Portugal joined the consortium. The long-term benefits of this program will be technology transfer among the nations producing the F-16, and a common-use aircraft for NATO nations. This program increases the supply and availability of repair parts in Europe and improves the F-16's combat readiness.

USAF F-16 multirole fighters were deployed to the Persian Gulf in 1991 in support of Operation Desert Storm, where more sorties were flown than with any other aircraft. These fighters were used to attack airfields, military production facilities, Scud missiles sites and a variety of other targets.

During Operation Allied Force, USAF F-16 multirole fighters flew a variety of missions to include suppression of enemy air defense, offensive counter air, defensive counter air, close air support and forward air controller missions. Mission results were outstanding as these fighters destroyed radar sites, vehicles, tanks, MiGs and buildings.

Since Sept. 11, 2001, the F-16 has been a major component of the combat forces committed to the Global War on Terrorism flying thousands of sorties in support of operations Noble Eagle (Homeland Defense), Enduring Freedom in Afghanistan and Iraqi Freedom

General Characteristics
Primary Function: Multirole fighter
Contractor: Lockheed Martin Corp.
Power Plant: F-16C/D: one Pratt and Whitney F100-PW-200/220/229 or General Electric F110-GE-100/129
Thrust: F-16C/D, 27,000 pounds
Wingspan: 32 feet, 8 inches (9.8 meters)
Length: 49 feet, 5 inches (14.8 meters)
Height: 16 feet (4.8 meters)
Weight: 19,700 pounds without fuel (8,936 kilograms)
Maximum Takeoff Weight: 37,500 pounds (16,875 kilograms)
Fuel Capacity: 7,000 pounds internal (3,175 kilograms); typical capacity, 12,000 pounds with two external tanks (5443 kilograms)
Payload: Two 2,000-pound bombs, two AIM-9 and 1,040-gallon external tanks
Speed: 1,500 mph (Mach 2 at altitude)
Range: More than 2,002 miles ferry range (1,740 nautical miles)
Ceiling: Above 50,000 feet (15 kilometers)
Armament: One M-61A1 20mm multibarrel cannon with 500 rounds; external stations can carry up to six air-to-air missiles, conventional air-to-air and air-to-surface munitions and electronic countermeasure pods
Crew: F-16C, one; F-16D, one or two
Unit cost: F-16A/B , $14.6 million (fiscal 98 constant dollars); **F-16C/D,**$18.8 million (fiscal 98

constant dollars)
Initial operating capability: F-16A, January 1979; F-16C/D Block 25-32, 1981; F-16C/D Block 40-42, 1989; and F-16C/D Block 50-52, 1994
Inventory: Total force, F-16C/D, 1,280

Point of Contact
Air Combat Command, Public Affairs Office; 130 Andrews St., Suite 202; Langley AFB, VA 23665-1987; DSN 574-5007 or 757-764-5007; e-mail: accpa.operations@langley.af.mil

FACT SHEET

U.S. Air Force Fact Sheet

F-22 RAPTOR

Mission

The F-22 Raptor is the Air Force's newest fighter aircraft. Its combination of stealth, supercruise, maneuverability, and integrated avionics, coupled with improved supportability, represents an exponential leap in warfighting capabilities. The Raptor performs both air-to-air and air-to-ground missions allowing full realization of operational concepts vital to the 21st century Air Force.

The F-22, a critical component of the Global Strike Task Force, is designed to project air dominance, rapidly and at great distances and defeat threats attempting to deny access to our nation's Air Force, Army, Navy and Marine Corps. The F-22 cannot be matched by any known or projected fighter aircraft.

Features

A combination of sensor capability, integrated avionics, situational awareness, and weapons provides first-kill opportunity against threats. The F-22 possesses a sophisticated sensor suite allowing the pilot to track, identify, shoot and kill air-to-air threats before being detected. Significant advances in cockpit design and sensor fusion improve the pilot's situational awareness. In the air-to-air configuration the Raptor carries six AIM-120 AMRAAMs and two AIM-9 Sidewinders.

The F-22 has a significant capability to attack surface targets. In the air-to-ground configuration the aircraft can carry two 1,000-pound GBU-32 Joint Direct Attack Munitions internally and will use on-board avionics for navigation and weapons delivery support. In the future air-to-ground capability will be enhanced with the addition of an upgraded radar and up to eight small diameter bombs. The Raptor will also carry two AIM-120s and two AIM-9s in the air-to-ground configuration.

Advances in low-observable technologies provide significantly improved survivability and lethality against air-to-air and surface-to-air threats. The F-22 brings stealth into the day, enabling it not only to protect itself but other assets.

The F-22 engines produce more thrust than any current fighter engine. The combination of sleek aerodynamic design and increased thrust allows the F-22 to cruise at supersonic airspeeds (greater than 1.5 Mach) without using afterburner -- a characteristic known as supercruise. Supercruise greatly expands the F-22 's operating envelope in both speed and range over current fighters, which must use fuel-consuming afterburner to operate at supersonic speeds.

The sophisticated F-22 aerodesign, advanced flight controls, thrust vectoring, and high thrust-to-weight ratio provide the capability to outmaneuver all current and projected aircraft. The F-22 design has been extensively tested and refined aerodynamically during the development

process.

The F-22's characteristics provide a synergistic effect ensuring F-22A lethality against all advanced air threats. The combination of stealth, integrated avionics and supercruise drastically shrinks surface-to-air missile engagement envelopes and minimizes enemy capabilities to track and engage the F-22 . The combination of reduced observability and supercruise accentuates the advantage of surprise in a tactical environment.

The F-22 will have better reliability and maintainability than any fighter aircraft in history. Increased F-22 reliability and maintainability pays off in less manpower required to fix the aircraft and the ability to operate more efficiently.

Background
The Advanced Tactical Fighter entered the Demonstration and Validation phase in 1986. The prototype aircraft (YF-22 and YF-23) both completed their first flights in late 1990. Ultimately the YF-22 was selected as best of the two and the engineering and manufacturing development effort began in 1991 with development contracts to Lockheed/Boeing (airframe) and Pratt & Whitney (engines). EMD included extensive subsystem and system testing as well as flight testing with nine aircraft at Edwards Air Force Base, Calif. The first EMD flight was in 1997 and at the completion of its flight test life this aircraft was used for live-fire testing.

The program received approval to enter low rate initial production in 2001. Initial operational and test evaluation by the Air Force Operational Test and Evaluation Center was successfully completed in 2004. Based on maturity of design and other factors the program received approval for full rate production in 2005. Air Education and Training Command, Air Combat Command and Pacific Air Forces are the primary Air Force organizations flying the F-22. The aircraft designation was the F/A-22 for a short time before being renamed F-22A in December 2005.

General Characteristics
Primary Function: Air dominance, multi-role fighter
Contractor: Lockheed-Martin, Boeing
Power Plant: Two Pratt & Whitney F119-PW-100 turbofan engines with afterburners and two-dimensional thrust vectoring nozzles.
Thrust: 35,000-pound class (each engine)
Wingspan: 44 feet, 6 inches (13.6 meters)
Length: 62 feet, 1 inch (18.9 meters)
Height: 16 feet, 8 inches (5.1 meters)
Weight: 43,340 pounds (19,700 kilograms)
Maximum Takeoff Weight: 83,500 pounds (38,000 kilograms)
Fuel Capacity: Internal: 18,000 pounds (8,200 kilograms); with 2 external wing fuel tanks: 26,000 pounds (11,900 kilograms)
Payload: Same as armament air-to-air or air-to-ground loadouts; with or without 2 external wing fuel tanks.
Speed: Mach 2 class with supercruise capability
Range: More than 1,850 miles ferry range with 2 external wing fuel tanks (1,600 nautical miles)
Ceiling: Above 50,000 feet (15 kilometers)
Armament: One M61A2 20-millimeter cannon with 480 rounds, internal side weapon bays carriage of two AIM-9 infrared (heat seeking) air-to-air missiles and internal main weapon bays carriage of six AIM-120 radar-guided air-to-air missiles (air-to-air loadout) or two 1,000-pound GBU-32 JDAMs and two AIM-120 radar-guided air-to-air missiles (air-to-ground loadout)
Crew: One
Unit Cost: $143 million
Initial operating capability: December 2005
Inventory: Total force, 137

Point of Contact
Air Combat Command, Public Affairs Office; 130 Andrews St., Suite 202; Langley AFB, VA 23665-1987; DSN 574-5007 or 757-764-5007; e-mail: accpa.operations@langley.af.mil

APPENDIX C
CHARACTERISTICS OF CHAFF

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APPENDIX C CHARACTERISTICS OF CHAFF

Defensive countermeasures are used by military aircraft during training in response to simulated threats. Chaff is a self-protection device that permits an aircraft threatened by enemy radar-directed munitions to distract and/or avoid the threat.

Chaff consists of extremely small strands (or dipoles) of an aluminum-coated crystalline silica core. When released from an aircraft, chaff initially forms a sphere, then disperses in the air and eventually drifts to the ground. The chaff effectively reflects radar signals in various bands (depending on the length of the chaff fibers) and forms a very large image or electronic "cloud" of reflected signals on a radar screen. When the aircraft is obscured from radar detection by the cloud, the aircraft can safely maneuver or leave an area.

Chaff is made as small and light as possible so that it will remain in the air long enough to confuse enemy radar. The chaff fibers are thinner than a human hair (i.e., generally 25.4 microns in diameter), and range in length from 0.3 to over 1 inch. The weight of chaff material in the RR-170 or RR-188 cartridge is approximately 95 grams or 3.35 ounces (United States Air Force [Air Force] 1997). Since chaff can obstruct radar, its use is coordinated with the Federal Aviation Administration (FAA). RR-170 and RR-188 chaff are the same size. RR-188 chaff has D and E band dipoles removed to avoid interference with FAA radar. RR-170 chaff dipoles are cut to disguise the aircraft and produce a more realistic training experience in threat avoidance.

1.0 CHAFF CHARACTERISTICS

Chaff is comprised of silica, aluminum, and stearic acid, which are generally prevalent in the environment. Silica (silicon dioxide) belongs to the most common mineral group, silicate minerals. Silica is inert in the environment and does not present an environmental concern with respect to soil chemistry. Aluminum is the third most abundant element in the earth's crust, forming some of the most common minerals, such as feldspars, micas, and clays. Natural soil concentrations of aluminum ranging from 10,000 to 300,000 parts per million have been documented (Lindsay 1979). These levels vary depending on numerous environmental factors, including climate, parent rock materials from which the soils were formed, vegetation, and soil moisture alkalinity/acidity. The solubility of aluminum is greater in acidic and highly alkaline soils than in neutral pH conditions. Aluminum eventually oxidizes to Al_2O_3 (aluminum oxide) over time, depending on its size and form and the environmental conditions.

The chaff fibers have an anti-clumping agent (Neofat – 90 percent stearic acid and 10 percent palmitic acid) to assist with rapid dispersal of the fibers during deployment (Air Force 1997). Stearic acid is an animal fat that degrades when exposed to light and air.

A single bundle of chaff consists of the chaff fibers in an 8-inch long rectangular tube or cartridge, a plastic piston, a cushioned spacer, and two plastic end caps (1/8-inch thick, 1-inch x 1-inch or 1-inch x 2-inch). The chaff dispenser remains in the aircraft. The plastic end caps and spacer fall to the ground when chaff is dispensed. The spacer is a spongy material (felt) designed to absorb the force of release. Figure 1 illustrates the components of a chaff cartridge. Table 1 lists the components of the silica core and the aluminum coating. Table 2 presents the characteristics of RR-188 or RR-170 chaff.

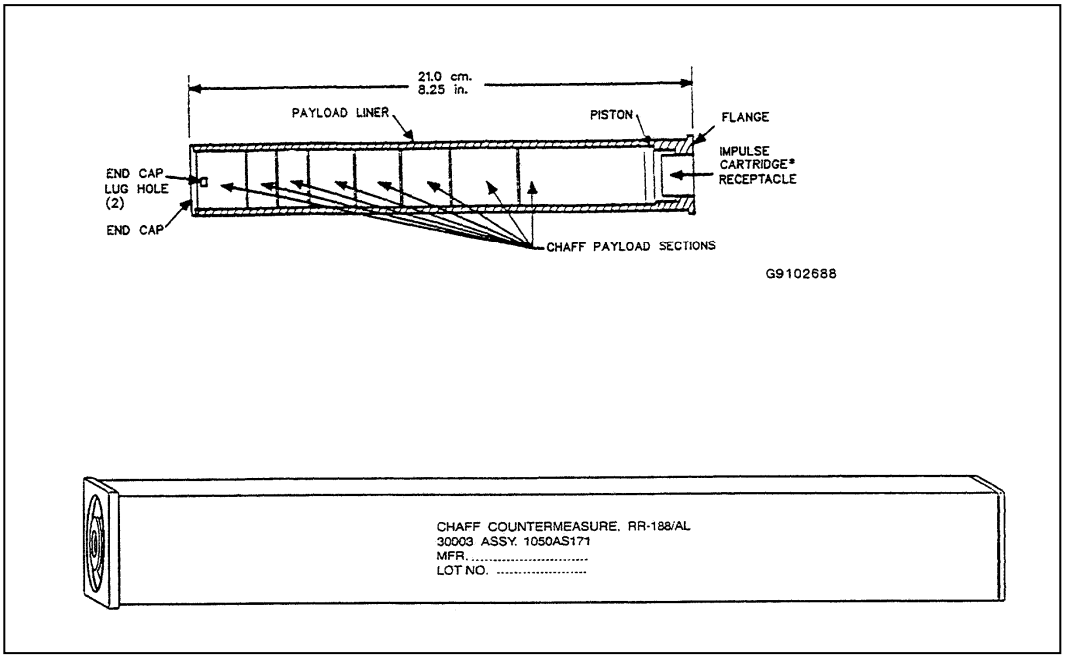

Figure 1. RR-188 or RR-170 Chaff Cartridge

Table 1. Components of RR-188 or RR-170 Chaff

Element	*Chemical Symbol*	*Percent (by weight)*
Silica Core		
Silicon dioxide	SiO_2	52-56
Alumina	Al_2O_3	12-16
Calcium Oxide and Magnesium Oxide	CaO and MgO	16-25
Boron Oxide	B_2O_3	8-13
Sodium Oxide and Potassium Oxide	Na_2O and K_2O	1-4
Iron Oxide	Fe_2O_3	1 or less
Aluminum Coating (Typically Alloy 1145)		
Aluminum	Al	99.45 minimum
Silicon and Iron	Si and Fe	0.55 maximum
Copper	Cu	0.05 maximum
Manganese	Mn	0.05 maximum
Magnesium	Mg	0.05 maximum
Zinc	Zn	0.05 maximum
Vanadium	V	0.05 maximum
Titanium	Ti	0.03 maximum
Others		0.03 maximum

Source: Air Force 1997

Table 2. Characteristics of RR-188 or RR-170 Chaff

Attribute	***RR-188 or RR-170***
Composition	Aluminum coated silica
Ejection Mode	Pyrotechnic
Configuration	Rectangular tube cartridge
Size	8 x 1 x 1 inches (8 cubic inches)
Number of Dipoles	5.46 million
Dipole Size (cross-section)	1 mil (diameter)
Impulse Cartridge	BBU-35/B
Other Comments	Cartridge stays in aircraft; less interference with FAA radar (no D and E bands)

Source: Air Force 1997

The B-1 uses RR-170 A/AL chaff. Figure 2 is a photograph of an open RR-170 chaff cartridge with all the pieces. RR-170 A/AL has the same material as the RR-188 chaff cartridge. The RR-170 A/AL has chaff dipoles cut differently from the RR-188 chaff. RR-188 chaff was originally used for tracking because the dipole did not interfere with FAA radars, but newer radars can now also detect RR-188 chaff.

The B-52 uses RR-112/AC chaff which is not deployed from a cartridge. RR-112/AC chaff comes in rolls which are like the chaff in Figure 2. The rolls are in a box which is installed in the B-52. A mechanical system then measures out the chaff to form a brief electronic cloud to mask the B-52 from radar threats.

The F-22 uses the same chaff material in a slightly different chaff cartridge to expedite clean ejection of the chaff. The chaff cartridge design is less likely to leave debris of any kind in the dispenser bay yet still provides robust chaff dispensing. F-22 delayed-opening chaff is packaged in two sets of soft packs that retain approximately the same number of dipoles per cut as RR-170 chaff. The differences are two end caps and six parchment paper wraps that facilitate deployment. Two end caps, two pistons, six approximately 2-inch by 4-inch paper pieces, and chaff fibers fall to the ground with each chaff cartridge deployed. Other aircraft participating in LFE training discharge comparable chaff fibers and similar residual pieces to those described for RR-170 chaff.

2.0 CHAFF EJECTION

Chaff is ejected from aircraft pyrotechnically using a BBU-35/B impulse cartridge. Pyrotechnic ejection uses hot gases generated by an explosive impulse charge. The gases push the small piston down the chaff-filled tube. A small plastic end cap is ejected, followed by the chaff fibers, and, in the case of F-22 chaff, three mylar pieces. The plastic tube remains within the aircraft. Debris from the ejection consists of two small, square pieces of plastic 1/8-inch thick (i.e., the piston and the end cap), three mylar strips, and the felt spacer. Table 3 lists the characteristics of BBU-35/B impulse cartridges used to pyrotechnically eject chaff.

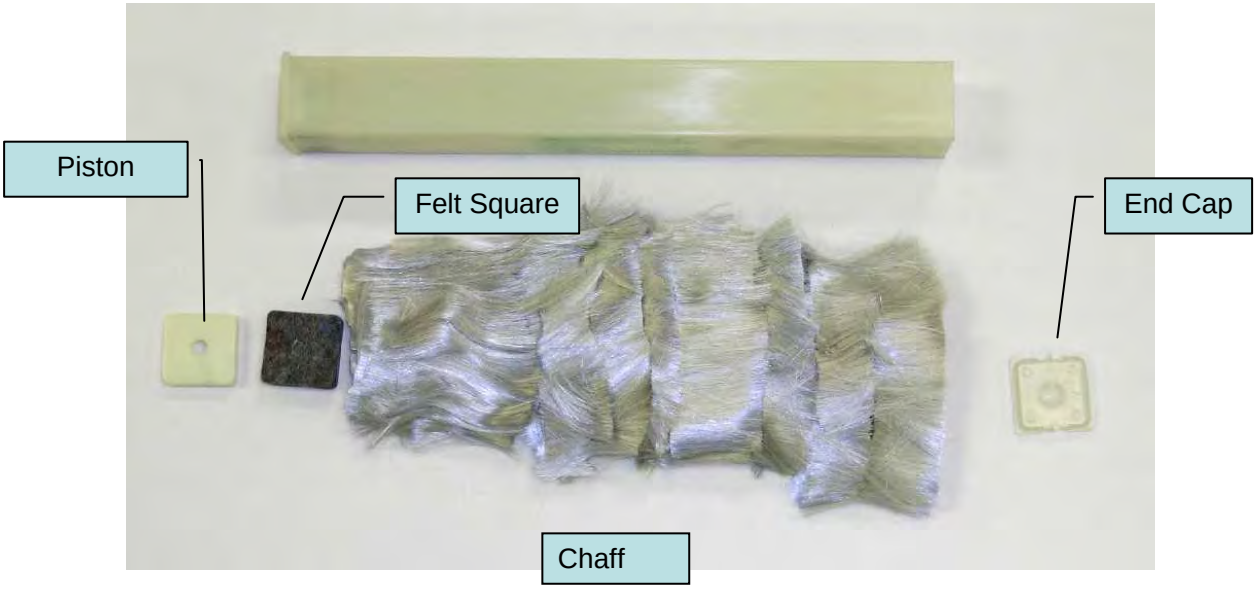

Figure 2. RR-170 A/AL Chaff

Table 3. BBU-35/B Impulse Charges Used to Eject Chaff

Component	*BBU-35/B*
Overall Size Overall Volume Total Explosive Volume	0.625 inches x 0.530 inches 0.163 inches^3 0.034 inches^3
Bridgewire	Trophet A 0.0025 inches x 0.15 inches
Initiation Charge	0.008 cubic inches 130 mg 7,650 psi boron 20% potassium perchlorate 80% *
Booster Charge	0.008 cubic inches 105 mg 7030 psi boron 18% potassium nitrate 82%
Main Charge	0.017 cubic inches 250 mg loose fill RDX ** pellets 38.2% potassium perchlorate 30.5% boron 3.9% potassium nitrate 15.3% super floss 4.6% Viton A 7.6%

Source: Air Force 1997

Upon release from an aircraft, chaff forms a cloud approximately 30 meters in diameter in less than one second under normal conditions. Quality standards for chaff cartridges require that they demonstrate ejection of 98 percent of the chaff in undamaged condition, with a reliability of 95 percent at a 95 percent confidence level. They must also be able to withstand a variety of environmental conditions that might be encountered during storage, shipment, and operation. The net result is that chaff is normally manufactured to tolerance levels in excess of 99 percent reliability.

Table 4 lists performance requirements for chaff.

Table 4. Performance Requirements for Chaff

Condition	*Performance Requirement*	
High Temperature	Up to +165 degrees Fahrenheit	
Low Temperature	Down to –65 °F	
Temperature Shock	Shock from –70 °F to +165 °F	
Temperature Altitude	Combined temperature altitude conditions up to 70,000 feet	
Humidity	Up to 95 percent relative humidity	
Sand and Dust	Sand and dust encountered in desert regions subject to high sand dust conditions and blowing sand and dust particles	
Accelerations/Axis	G-Level	Time (minute)
Transverse-Left (X)	9.0	1
Transverse-Right (-X)	3.0	1
Transverse (Z)	4.5	1
Transverse (-Z)	13.5	1
Lateral-Aft (-Y)	6.0	1
Lateral-Forward (Y)	6.0	1
Shock (Transmit)	Shock encountered during aircraft flight	
Vibration	Vibration encountered during aircraft flight	
Free Fall Drop	Shock encountered during unpackaged item drop	
Vibration (Repetitive)	Vibration encountered during rough handling of packaged item	
Three Foot Drop	Shock encountered during rough handling of packaged item	

Note: Cartridge must be capable of total ejection of chaff from the cartridge liner under these conditions.
Source: Air Force 1997

3.0 POLICIES AND REGULATIONS ON CHAFF USE

Current Air Force policy on use of chaff and flares was established by the Airspace Subgroup of Headquarter Air Force Flight Standards Agency in 1993. It requires units to obtain frequency clearance

from the Air Force Frequency Management Center and the FAA prior to using chaff to ensure that training with chaff is conducted on a non-interference basis. This ensures electromagnetic compatibility between the FAA, the Federal Communications Commission, and Department of Defense (DoD) agencies. The Air Force does not place any restrictions on the use of chaff provided those conditions are met (Air Force 1997).

Air Force Instruction (AFI) 13-201, U.S. Air Force Airspace Management, September 2001. This guidance establishes practices to decrease disturbance from flight operations that might cause adverse public reaction. It emphasizes the Air Force's responsibility to ensure that the public is protected to the maximum extent practicable from hazards and effects associated with flight operations.

AFI 11-214 Aircrew and Weapons Director and Terminal Attack Controller Procedures for Air Operations, July 1994. This instruction delineates procedures for chaff and flare use. It prohibits use unless in an approved area.

4.0 ENVIRONMENTAL EFFECTS OF CHAFF

The potential for effects of chaff deposition and fragmentation in the environment has been of interest to agencies and the public. There has also been interest by land management agencies in the military use of chaff. This interest is largely driven by concern that the fragmentation of chaff fibers was not documented. Does chaff begin breaking down almost immediately following ejection? Does it become small enough to be inhaled by man or by wildlife? Conversely, if the chaff does not fragment, could chaff particles be ingested by livestock or wildlife? What would be the environmental effects of chaff particles?

A variety of studies on the effects of chaff have been conducted over the past 40 years for the Army, Navy, Air Force, National Guard Bureau, and Canadian Forces Headquarters (Government Accountability Office [GAO] 1998). The focus of these studies ranged from effects on livestock from ingestion of chaff (Canada Department of Agriculture 1972) to environmental impacts from the deposition of chaff fibers on marine and terrestrial ecosystems (Air Force 1997). In the early 1990s, ACC prepared a study on the known environmental consequences of chaff and other defensive measures (Air Force 1997). None of the studies demonstrated significant environmental effects of chaff.

In response to continuing concern on the part of private citizens with the military's use of chaff, Senator Harry Reid (Nevada) requested that the GAO conduct an independent evaluation of chaff use. The subsequent GAO report (1998) acknowledged that citizens and various public interest groups continued to express concerns of potentially harmful or undesirable effects of chaff on the environment. The report recommended that the Secretaries of the Air Force, Army, and Navy determine the merits of open questions made in previous chaff reports and whether additional actions are needed to address them.

4.1 Atmospheric Effects

The DoD engaged a "Select Blue Ribbon Panel" of independent, non-government scientists to 1) review the environmental effects of radio frequency (RF) chaff used by the United States (U.S.) military; and 2) to make recommendations to decrease scientific uncertainty where significant environmental effects of RF chaff are possible. The report of the Blue Ribbon Panel (Spargo 1999) identified a variety of issues of interest, and included specific recommendations for the further evaluation of chaff use.

The fate of chaff fibers after release was of particular interest to the Blue Ribbon Panel. The panel requested additional data on the degree of chaff fragmentation and the potential for re-suspension of

chaff or chaff fragments in the natural environment. Two issues related to chaff fragmentation and re-suspension were identified (Spargo 1999).

Atmospheric effects: What fraction of emitted chaff breaks up from mid-air turbulence into respirable particles?

Ground effects: What fraction of chaff reaching the ground is subsequently abraded, re-suspended, and reduced to respirable sized particles?

An independent study on chaff fragmentation and re-suspension rates was initiated to evaluate these issues. *The Fate and Distribution of Radio-Frequency Chaff*, Desert Research Institute (DRI) was released on 1 April 2002. A parallel independent study also addressed chaff fragmentation and resuspension (Cook 2002).

Both studies used atmospheric chaff fragmentation tests and a fluidized bed to simulate chaff fragmentation in the atmosphere. The ground chaff fragmentation tests used wind generation in a portable environmental chamber to simulate chaff fragmentation after it falls to the ground.

4.2 Mid-Air Turbulence Effects

Chaff in the military training environment released at altitudes below 30,000 feet above ground level (AGL) are typically deposited on the ground within ten hours of formation (DRI 2002). Atmospheric fragmentation, which appears to occur, takes place within the first 2 hours of release, likely immediately after release, when the density of fibers within the cloud is at its greatest. The DRI findings suggest that in the simulated mid-air column, relatively little fragmentation occurs between 2 and 8 hours (DRI 2002).

The experimental data obtained from tests were not sufficiently robust to definitively conclude when most chaff fragmentation occurs. Most fragmentation could occur immediately upon ejection or within the first 2 hours after ejection. While chaff fragmentation in the DRI tests appeared to be minor, some fragmentation did occur, and there was some degree of formation of particles sufficiently small as to be considered respirable. Abrasion tests suggested that on the order of one part mass in 10^7 may be abraded to particulate matter less than 10 micrograms in diameter (PM_{10}) or smaller (DRI 2002). The data sampling and testing did result in a small fraction of chaff being converted to respirable particles. The data suggest that this is not a significant factor in the fate of training chaff in the mid-air column. DRI concluded that virtually none of the airborne chaff was degraded to respirable size particles of PM_{10} or less. Based on these tests, there is little environmental risk from airborne chaff abrading to respirable particles prior to the chaff being deposited on the surface.

4.3 Surface Effects and Fragmentation

The 1998 GAO report recommended that the Secretaries of the Air Force, Army, and Navy determine the merits of open questions made in previous chaff reports and whether additional actions were needed to address them. The Select Blue-Ribbon Panel of independent, non-government scientists (Spargo 1999) identified a need for further investigation of the re-suspension of chaff and chaff fragments once deposited on the surface.

4.3.1 Ground Surface Effects

Following deposition on the ground, chaff is subjected to various physical processes that may break the individual fibers into fragments. Processes that may induce fragmentation on the ground include wind-driven re-suspension and deposition, wind-driven interaction with soils, wind-driven interaction with plants, disturbance by animals, and vehicular traffic. Processes that may induce fragmentation on water

include wind and wave action. Field studies on ground fragmentation were conducted to gain information on the relative importance of these processes and to address different test approaches to evaluate post-deposition fragmentation (DRI 2002; Cook 2002).

Results of these studies indicate that, once deposited on the ground, chaff undergoes rapid fragmentation. Typically between 5 and 10 percent of the chaff in these tests was reduced to particles less than 10 microns in length over a 2-hour period. In nature, assuming similar wind, soil interaction, and other processes are at work, it seems likely that most chaff would be reduced to fragments less than 10 microns within a matter of days of deposition. Chaff fragmentation on the ground surface is primarily wind driven. Increasing airflow in these studies resulted in increasing fragmentation. This suggests that higher wind levels in the ambient environment would lead to increased fragmentation (DRI 2002).

Baseline sampling results from this study indicated minimal chaff concentrations (1 microgram/square foot) in the soil of an area heavily utilized for military aircraft training using chaff. This may indicate extensive fragmentation and dispersal of chaff used for training purposes on the range. The naturally occurring materials that comprise chaff, wind driven turbulence, fragmentation, and dispersal of PM_{10} size particles provide a sufficient basis to explain this finding. In essence, chaff particles, once on the ground, appear to rapidly degrade and become indiscernible from ambient silica and aluminum soil materials (DRI 2002, Cook 2002).

4.3.2 Aquatic Surface and Substrate Effects

Potential aquatic and marine effects of chaff have been of interest to both the Air Force and the Navy. Aquatic environments are sensitive to any chemicals released from any sources. The questions asked regarding chaff in an aquatic environment deal with the dissolution of the chaff in the water or marine environment, the potential resulting release of chemicals which could be mobile within the aquatic ecosystems, and the potential sensitivity of aquatic organisms to released chemicals (Farrell and Siciliano 2005). Although not specifically tested, chaff fragments in a marine environment would be subject to both wind and wave action. This suggests that chaff fragmentation in an aquatic marine environment would be similar to chaff fragmentation observed in ground fragmentation tests.

Chaff deposition on the water surface would be subject to physical factors and would be expected to become part of the underlying sediment. The Navy sponsored a series of studies to address the potential for chaff materials to concentrate in the sediment. An area in the Chesapeake Bay was identified as a location for Navy-sponsored studies. A series of studies were performed in the Chesapeake Bay to address whether chaff release was contributing to aluminum levels in the Chesapeake Bay (Wilson *et al.* 2001). An estimated 500 tons of chaff had been deposited over the bay during aircraft and Navy maneuvers for both research and training purposes from the mid-1970s to 1995. As part of the Wilson study, a series of sediment sampling locations were tested at various sampling depths to determine whether increased aluminum could be detected. A background sampling location at approximately the same depths was sampled in an area not subject to chaff deposition.

The studies found no significant difference in mean aluminum concentrations between the sediments that were from the control site and those taken from areas of heavy chaff use. The results did demonstrate some variation in the types of aluminum at the test and control locations. Inorganic monometric aluminum concentrations were significantly lower under the chaff use areas than in the background conditions. Mean concentrations of organic monometric aluminum were significantly higher in the sediment under the high chaff use area than in the control area. Exchangeable aluminum (AL_{EX}) represents aluminum bound to the soil by an electrostatic charge. AL_{EX} is a good indicator of soil acidity and of the concentration of potential toxic aluminum present. AL_{EX} concentrations under the

heavy chaff use area were numerically lower but not significantly different from those of the control area (Wilson *et al.* 2001).

Sediment sampling in the Chesapeake Bay area did not indicate that aluminum concentrations below the flight path were significantly increased as a result of chaff use. Aluminum concentrations in fish, plants, or other biota were not assessed in the sediment survey.

Aluminum is not known to accumulate to any great extent in most invertebrates under non-acid conditions. It is unlikely that much, if any, of the aluminum present as a result of chaff use would be available for uptake by aquatic plants, fish, or other biota. The conclusions reached by Wilson *et al.* suggested that deployment of chaff resulted in minimal but statistically significant increases in nontoxic aluminum in sediment under the flight path. Concentrations of aluminum of toxicological interest were significantly lower under the heavy chaff use area than in background sediment samples (Wilson *et al.* 2001).

Additional studies were conducted to evaluate the potential for chaff concentrations to be harmful to aquatic organisms. A Chesapeake Bay study by Systems Consultants for the U.S. Navy found no evidence that chaff was acutely toxic to six species of aquatic organisms (Arfsten *et al.* 2002). Concentrations of chaff between 10 to 100 times the exposure levels expected to be found in the Chesapeake Bay were placed in tanks containing a variety of aquatic organisms. American oysters, blue mussels, blue crab, and killifish were among the species tested. There was no significance in mortality as a result of exposure to concentrations of chaff of one to two orders of magnitude greater than expected chaff concentrations (Arfsten *et al.* 2002).

Chaff was not found to result in concentrations of aluminum which would produce environmental impacts in the Chesapeake Bay environment. Part of the reason for this may be that chaff is comprised of nearly entirely aluminum and silicate with some trace elements. Aluminum and silicate are the most common minerals in the earth's crust. Ocean waters are in constant exposure to crust materials, and there would be little reason to believe that the addition of small amounts of aluminum and silicate from chaff would have any effect on either the marine environment or sediment.

Before becoming part of the sediment, could chaff particles have environmental consequences? Chaff particles in the aquatic environment are similar to natural particles produced by sponges. The most abundant ocean shallow water sponges have siliceous spicules (small spikes) which are very similar to chaff. All fresh water sponges also contain spicules. Sponge spicules are simple, straight, needle-like silicon dioxide spikes, often with sharp pointed ends. Sponge spicules range from 1 to 30 micrometers (µm) in diameter and from 40 to 850 µm in length. Chaff fibers are approximately 25 µm in diameter and can break down to different lengths. Thus, naturally occurring sponge spicules are approximately the same diameter and can be the same length as chaff fibers. Both marine and fresh water sponges are abundant in the environment and aquatic animals regularly come in contact with spicules. A variety of species feed on sponges, including ring-necked ducks, crayfish, sea urchins, clams, shrimp, larval king crabs, and hawks-bill turtles. These species do not purposefully consume spicules but they do come in contact with spicules as a result of consuming sponges. Aquatic organisms are regularly exposed to and consume materials of the same size and similar composition to chaff fibers (Spargo 1999). This contact and consumption would reduce the likelihood that free floating chaff particles would result in environmental consequences.

Chaff in an aquatic environment has not been found to significantly increase the concentration of any toxic aluminum constituents in sediments under airspace that has undergone 25 years of chaff operations. Concentrations of chaff in test environments were not found to result in a significant change in mortality to a variety of marine organisms in the Chesapeake Bay area. No effect was seen in

marine organisms exposed to concentrations of 10 times and 100 times the expected environmental exposure. Marine and fresh water sponges normally create chaff-like spicules and foraging species are exposed to and consume these spicules on a regular basis with no detrimental effect. Chaff release in airspace above an aquatic environment is not expected to affect the environment and likely is not discernible within the environment.

4.4 Chaff Effects on Radar Systems

Chaff is designed to interfere with radar so that a maneuvering aircraft can escape a radar lock from an opposing radar. This use of chaff in training could affect weather monitoring radar. Weather radar has become increasingly important to predicting both flight and ground weather effects.

4.4.1 Weather Tracking Radar

The primary weather surveillance radar operated by the National Weather Service (NWS), FAA, and the DoD is the Weather Surveillance Radar-1988 Doppler (WSR-88D system) (National Research Council 2002). DoD training uses chaff as a defensive countermeasure. Within the CONUS, the Air Force uses RR-188 chaff to reduce, but not eliminate, chaff caused echoes to weather and other radars. In certain regions of the CONUS, including near DoD training areas in the west and southwest, RR-188 chaff can be seen as a major radar echo contaminant (Elmore *et al.* 2004). Chaff deployed in the training areas can include RR-188 chaff, as well as combat coded chaff which creates a chaff echo.

The Next Generation Weather Radar (NEXRAD) system provides Doppler radar coverage to most of the U.S. Designed in the mid-1980s, NEXRAD is continuing to be upgraded to meet air traffic and weather prediction requirements (National Research Council 2002). As part of the ongoing NEXRAD modernization, the NWS is adding polarimetric capability to existing operational radars. These capabilities improve the radar's ability to identify and classify hydrameteor types, such as rain, hail, ice crystals, and to distinguish non-meteorological types, such as chaff (Ryzhkov *et al.* 2003). Several radar images have distinctive properties which can be differentiated using radar classification algorithms.

4.4.2 Airspace and Range Issues

The improvements in NEXRAD have enhanced the ability of radar systems to detect RR-188 chaff. Investigations have been conducted to see whether RR-188 training chaff could be deployed and remain within the boundaries of a training airspace. By its very nature, chaff is light and designed to remain airborne to permit the evading aircraft to maneuver while the chaff cloud breaks radar contact. Could chaff be deployed at a low enough altitude that, under specific meteorological conditions, chaff particles would stay within the surface area under the training airspace? In most cases, this is not possible because the meteorological conditions and chaff fall rate are unpredictable. It has not been possible to determine where chaff particles would fall. The chaff plume migrates with the prevailing wind at altitude. In a series of case studies designed to track chaff plumes, the chaff plume from a release at altitudes between 15,000 to 22,000 feet above mean sea level (MSL), under moderate wind and stable atmosphere conditions, produced chaff plumes that traveled over 100 miles in two hours and could be expected to stay aloft for approximately another three hours. The total expected distance traveled by the deployed chaff prior to being deposited on the surface could be in the 120 to 300 mile range (DRI 2002).

The nature of chaff and the diversity of meteorological conditions mean that deployed chaff will continue to be an echo contaminant. This echo effect can be partially addressed through the radar operators understanding when and where chaff is deployed and, possibly, through additional software or hardware refinement to distinguish and differentiate the chaff echo contamination.

4.5 Chaff Conclusions

Although large numbers of chaff bundles are deployed in training, modern chaff is typically not easy to identify in the environment unless the chaff bundle fails to properly deploy and a clump of chaff is deposited on the surface. Chaff particles are difficult to identify in an environment subject to training chaff use for decades. The reasons for the difficulty in identifying chaff or chaff particles is because chaff is found to rapidly fragment on the surface and chaff is primarily composed of silica and aluminum, two of the most common elements in the earth's crust. Multiple studies to identify chaff particles or to locate elevated concentrations on the ground or in substrate have had limited success, primarily because chaff rapidly fragments in the environment and becomes indiscernible from ambient soil particles. No biological effects to marine organisms have been observed even when such organisms are subject to substantially higher concentrations than could be expected to occur as a result of training. The use of parchment paper in place of Mylar for delayed opening chaff reduces the deposition of plastic pieces to the environment to the level experienced with similar non delayed opening chaff.

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APPENDIX D
CHARACTERISTICS AND ANALYSIS OF FLARES

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APPENDIX D CHARACTERISTICS AND ANALYSIS OF FLARES

1.0 INTRODUCTION

Aircraft participating in Large Force Exercises (LFEs) often use a variety of self-protection flares in approved airspace. Self-protection flares are magnesium pellets that, when ignited, burn for 3.5 to 5 seconds at 2,000 degrees Fahrenheit. The burn temperature is hotter than the exhaust of an aircraft, and therefore attracts and decoys heat-seeking weapons targeted on the aircraft. Flares are used in pilot training to develop the near instinctive reactions to a threat that are critical to combat survival. This appendix describes flare characteristics, ejection, risks, and associated regulations.

2.0 FLARE CHARACTERISTICS

Self-protection flares are primarily mixtures of magnesium and Teflon (polytetrafluoroethylene) molded into rectangular shapes (United States Air Force [Air Force] 1997). Longitudinal grooves provide space for materials that aid in ignition. Typically, flares are wrapped with an aluminum-coated mylar or filament-reinforced tape (wrapping) and inserted into an aluminum (0.03 inches thick) case that is closed with a felt spacer and a small plastic end cap (Air Force 1997). The top of the case has a pyrotechnic impulse cartridge that is activated electrically to produce hot gases that push a piston, the flare material, and the end cap out of the aircraft into the airstream.

The B-1 uses MJU 23 A/B flares and the B-52 uses ALA-17 A, B, or C flares. The F-16 uses M-206 and MJU-7 A/B flares. F-22 uses MJU-10/B flares. The F-15 uses either the MJU-10/B or MJU-7 A/B flare. Table 1 presents the types of aircraft and flares which could be normally expected during in the Powder River Training Complex (PRTC). There are three types of ignition mechanisms for self-protection flares: non-parasitic, parasitic, and semi-parasitic. The non-parasitic flare is discharged from the aircraft before ignition. The parasitic flare ignites inside the tube within the aircraft and is discharged already burning. The semi-parasitic flare is thrust out of the case by a firing mechanism that also begins the flare ignition process. Both the MJU-10/B and MJU-7 A/B are semi-parasitic flares.

Figure 1 is a drawing of a simple M-206 flare. It is 1 inch wide, 1 inch high, and 8 inches long. When the firing device is electronically triggered, gas pressure pushes the small nylon or plastic piston. A hole extends through the piston and concurrently starts the flare burning. The piston pushes the flare out of the casing, pops off the plastic end cap, splits the wrapping material, and deploys the flare. Figure 2 presents an M-206 countermeasure flare and the aluminum case, which stays in the aircraft.

Table 1. Typical Self-Protection Flares Used for Training in ACC-scheduled Airspace

Attribute	***ALA-17***	***M-206***	***MJU-7 A/B***	***MJU-10/B***	***MJU-23/B and A/B***
Aircraft	B-52, AC-130	A-10, F-16, C-130, C-17	F-16, F-15, C-130	F-15, F-22	B-1B
Mode	Parasitic	Parasitic	Semi-parasitic	Semi-parasitic	Non-parasitic
Configuration	2 cylindrical cartridges in series	Rectangular	Rectangular	Rectangular	Cylindrical
Size	Each cylinder 4.75x2.25 inches (diameter)	1x1x8 inches (8 cubic inches)	1x2x8 inches (16 cubic inches)	2.66x2x8 inches (42.6 cubic inches)	10.5x2.75 inches (diameter) (90.7 cubic inches)
Impulse cartridge	None; electrically activated M-2 squib	M-796	BBU-36/B	BBU-36/B	BBU-46/B
Safety and Initiation (S&I) Device	None	None	Slider assembly	Slider assembly	Slider assembly with ignition charge
Weight (nominal)	Pellet: 18 oz Canister: 10 oz	6.9 ounces	13 ounces	40 ounces	43 ounces
Other Comments	Canister ejected with first unit	None	None	None	None

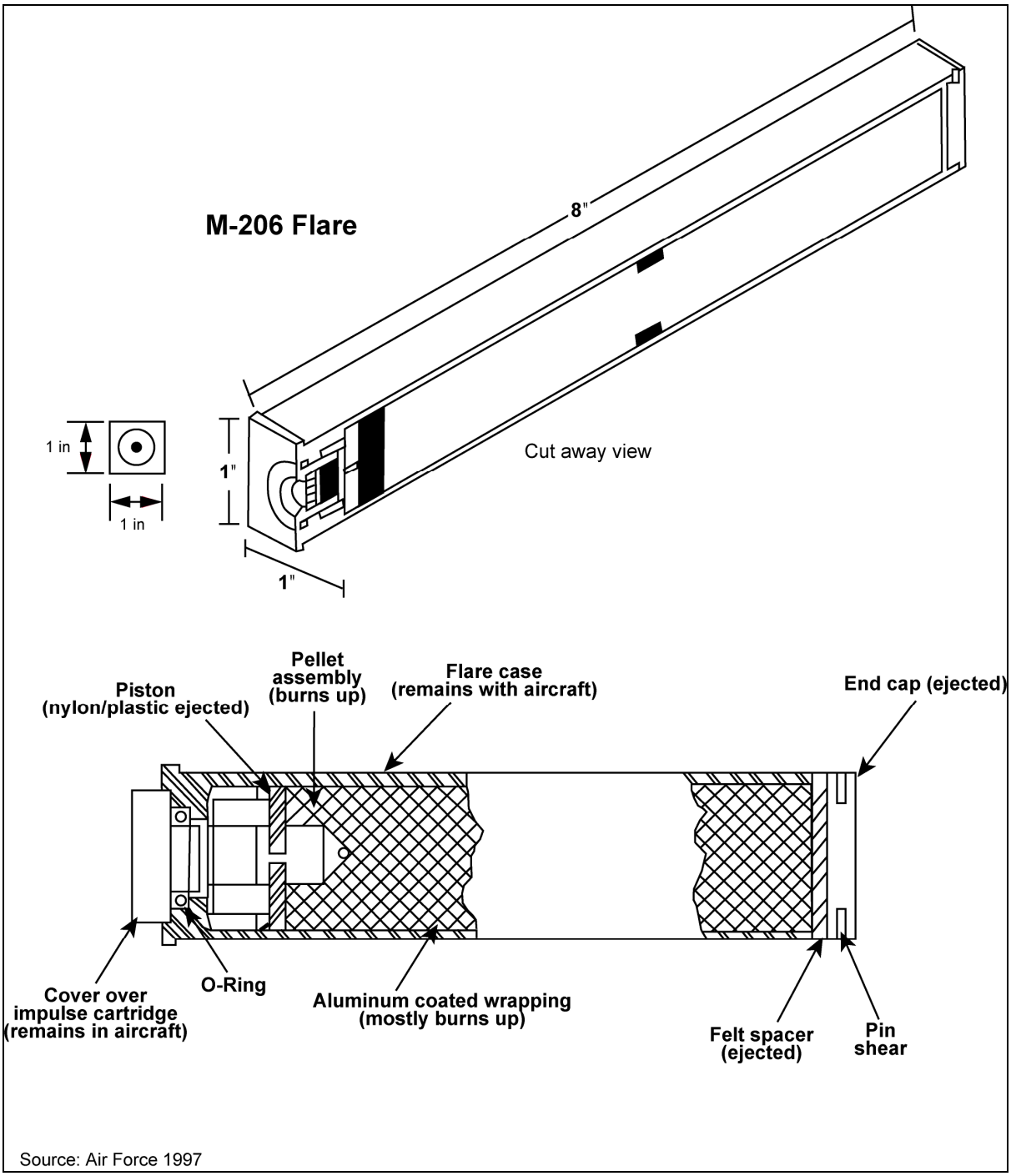


Figure 1. M-206 Flare

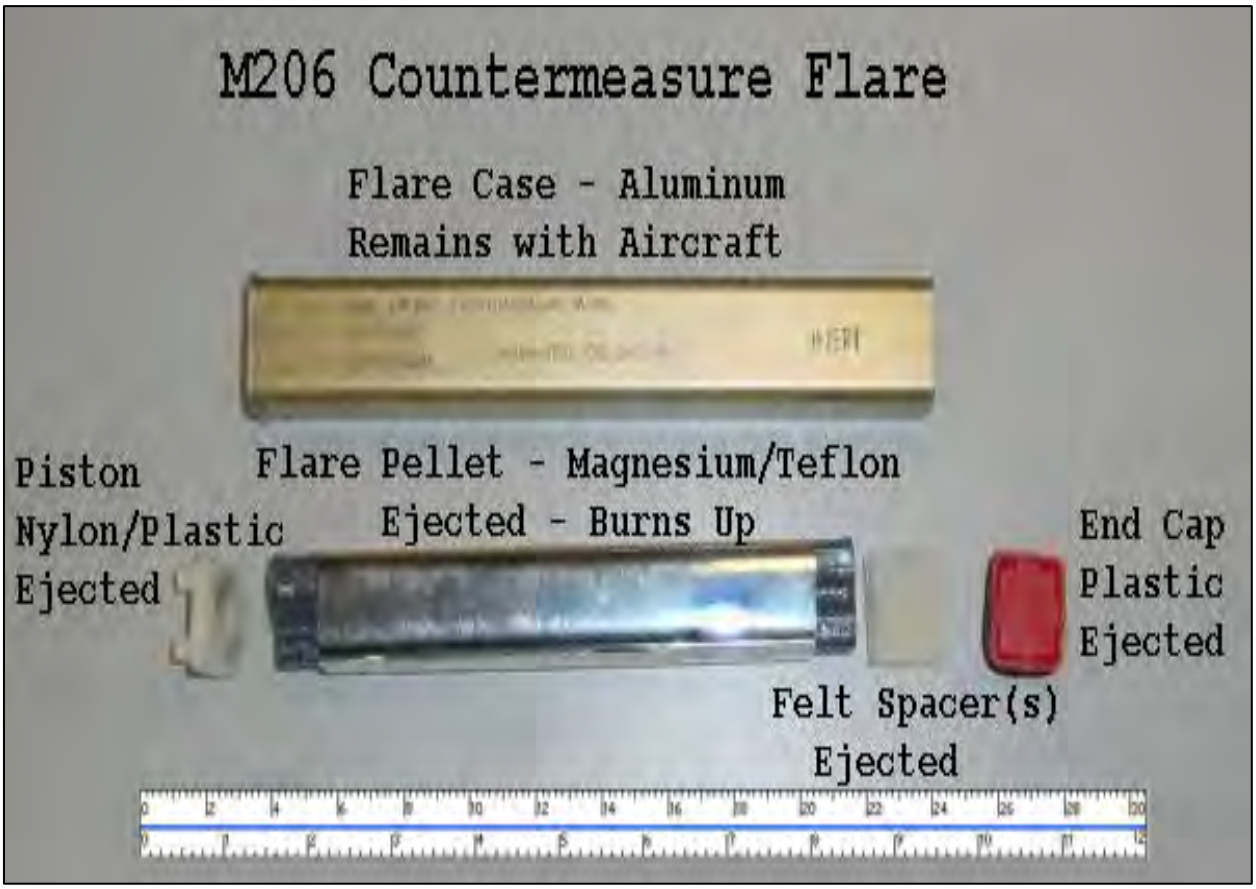


Figure 2. M-206 Countermeasure Flare

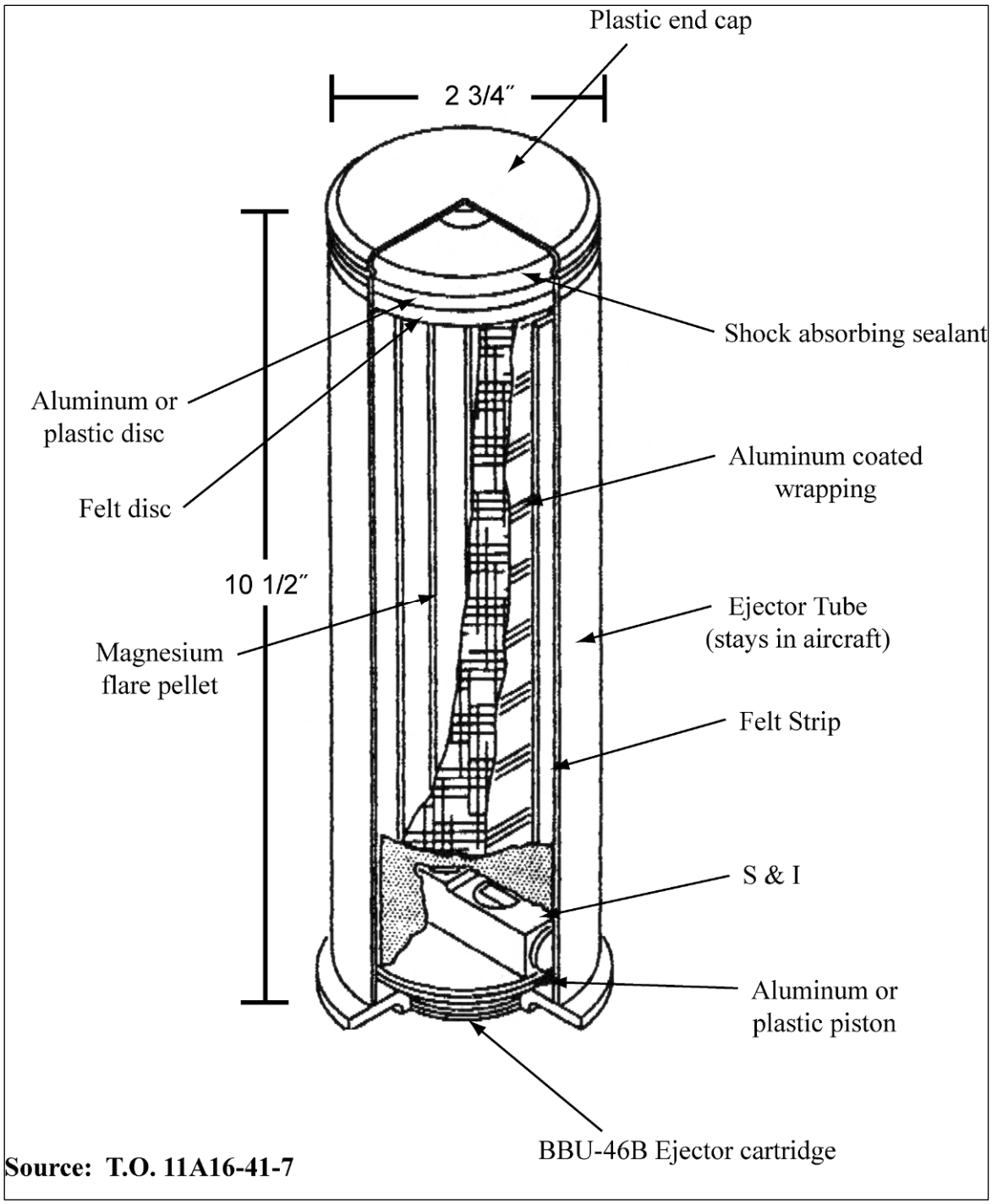
A flare may be compared to a muzzle-loading rifle. There is a firing cap, a powder charge, wadding between the charge and the bullet, and a wad at the end that keeps everything in place. The electrical firing "cap" creates a gas that ejects the plastic or nylon slider, 2 felt spacers that hold everything in place, and the end cap. The "bullet" is a magnesium/Teflon flare pellet that is ejected and burns up in 4 to 5 seconds.

B-1 and B-52 flares would be used during training exercises in PRTC training airspace. The B-1B uses the MJU-23/B flare as noted in Table 1. The MJU-23/B, shown in Figure 3 is a non-parasitic cylindrical flare used only on the B-1B aircraft. It is 10.5 inches long and 2.75 inches in diameter. Figure 4 is a photograph of the parts of the MJU 23/B flare. The MJU-23/B flare includes the same S&I device as the semi-parasitic MJU-7 A/B flare. The MJU-23/B has a plastic end cap with 0.5 inches of black rubber potting compound designed to absorb the shock of hitting spring-loaded doors on the aircraft. The earlier MJU-23/A used an aluminum piston and included strips of felt spacers on the side and circular felt spacers in the cylinder. The newer MJU-23/B replaces the aluminum with a plastic piston, retains circular felt spacers, and reduces the side felt spacer strips. The MJU-23/B uses the BBU-46/B impulse cartridge. The MJU-23A/B B1 bomber flare expels, along with the magnesium/Teflon flare pellet, other non-flare residual materials. Residual materials for the MJU-23A/B include two felt pads, a tin closure cap, a plastic/nylon end cap, and a piston with a Safe and Initiation (S&I) system attached. In most flare deployments, the aluminum wrap around the magnesium pellet will be burned and blown off when the flare ignites upon exiting the flare's case.

The B-52 uses the ALA-17 A/B flare as noted in Table 1. A drawing of the ALA-17A/B flare is presented in Figure 5. The flare consist of two independently fired aluminum cylinders, each 4.75 inches long and 2.25 inches in diameter, crimped together end-to end. The ALA-17 A/B flare with the two cylinders is 9.5 inches long, 2.25 inches in diameter, and from the outside, looks similar to the MJU-23/B flare (Figure 4). When the top cylinder is fired, the flare pellet is ejected from the aircraft, along with the entire bottom cylinder. Impulse cartridges are not used; the flares are fired directly with an electrically activated squib set in potting compound. The M-2 squib weights about 0.0022 ounces and is composed of 40 percent potassium chlorate, 32 percent lead thiocyanate, 18 percent charcoal, and 10 percent Egyptian lacquer (Global Security 2008). Both the upper and lower flare case will expel an aluminum end cap and plastic piston. Both the upper and lower flare are deployed and ignited by the impulse cartridge. Therefore, there is no S&I device in either the upper or lower flare cartridge case. The newer ALA-17 C flare has upper and lower flare cylinders both contained in one aluminum housing, depicted in the cutaway Figure 6. Both the upper and lower flares are wrapped in aluminum tape and possess individual deployment and ignition systems. A plastic end cap and S&I system are deployed with the individual flare pellets. The lower flare's expended impulse cartridge and aluminum housing/mid-spacer are expelled by deployment of the upper flare. The ALA-17C model full aluminum housing remains in the B-52 dispenser rack.

Figure 7 is a drawing of an MJU-7 A/B flare. The MJU-7 A/B is a semi-parasitic flare which contains a charge that is ignited as the flare is ejected from the aircraft. The MJU-7 A/B is 2 inches wide, 1 inch high, and 8 inches long. The MJU-7 A/B is similar to the M-206, with a flare pellet, a nylon or plastic slider (or piston), felt spacers, and an end cap. In addition, the MJU-7 A/B contains a safe and initiation (S&I) device which is ejected with flare deployment. The S&I device provides for the ignition and also splits open the wrapping as the flare exits the aircraft. Figure 8 presents a cutaway view of all parts of the MJU-7 A/B flare.

The flare used by the F-22 is the MJU-10/B flare. Figure 9 is a drawing of the MJU-10/B flare. The primary difference between the MJU-7 A/B and the MJU-10/B flare types is that the MJU-10/B flare is twice as large as the MJU-7 A/B. Table 2 provides a summary description of the M-206, MJU-7 A/B, and MJU-10/B flares. The M-206 contains a flare pellet of approximately 7 cubic inches. The MJU-7 A/B flare pellet is approximately 14 cubic inches and the MJU-10/B flare pellet is approximately 36 cubic inches. Table 3 presents the typical composition of F-22 and F-15 defensive flares. The flares are expelled from the flare cartridges with a BBU-36/B impulse charge. Table 4 presents the components of this impulse charge.



Source: T.O. 11A16-41-7

Figure 3. MJU-23/B Flare Used by B-1B Aircraft

Figure 4. MJU-23 Flare

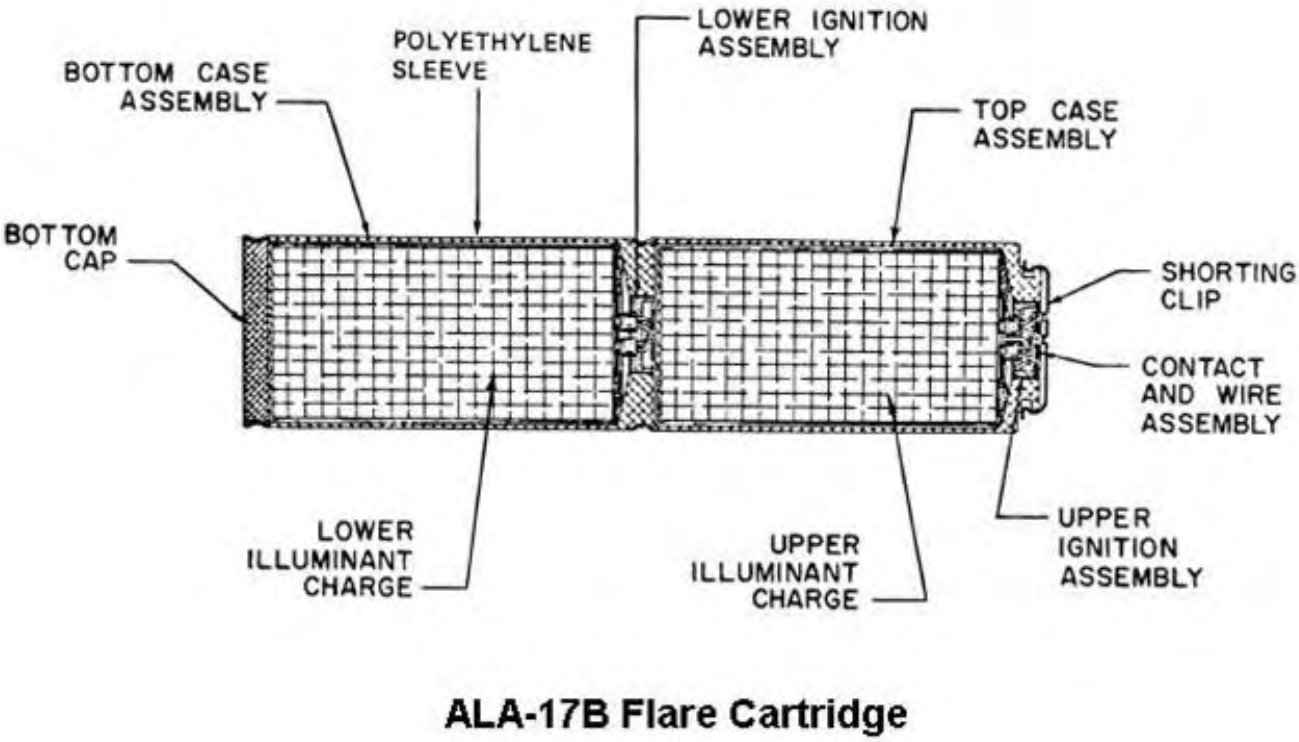


Figure 5. ALA-17 Flare Cartridge

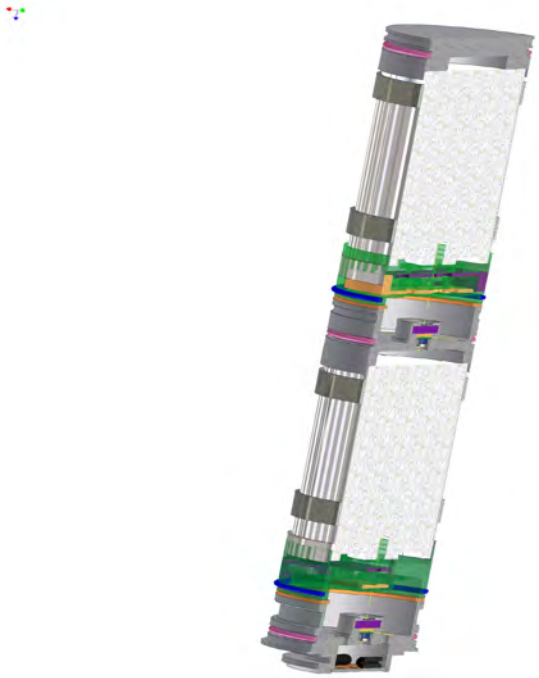
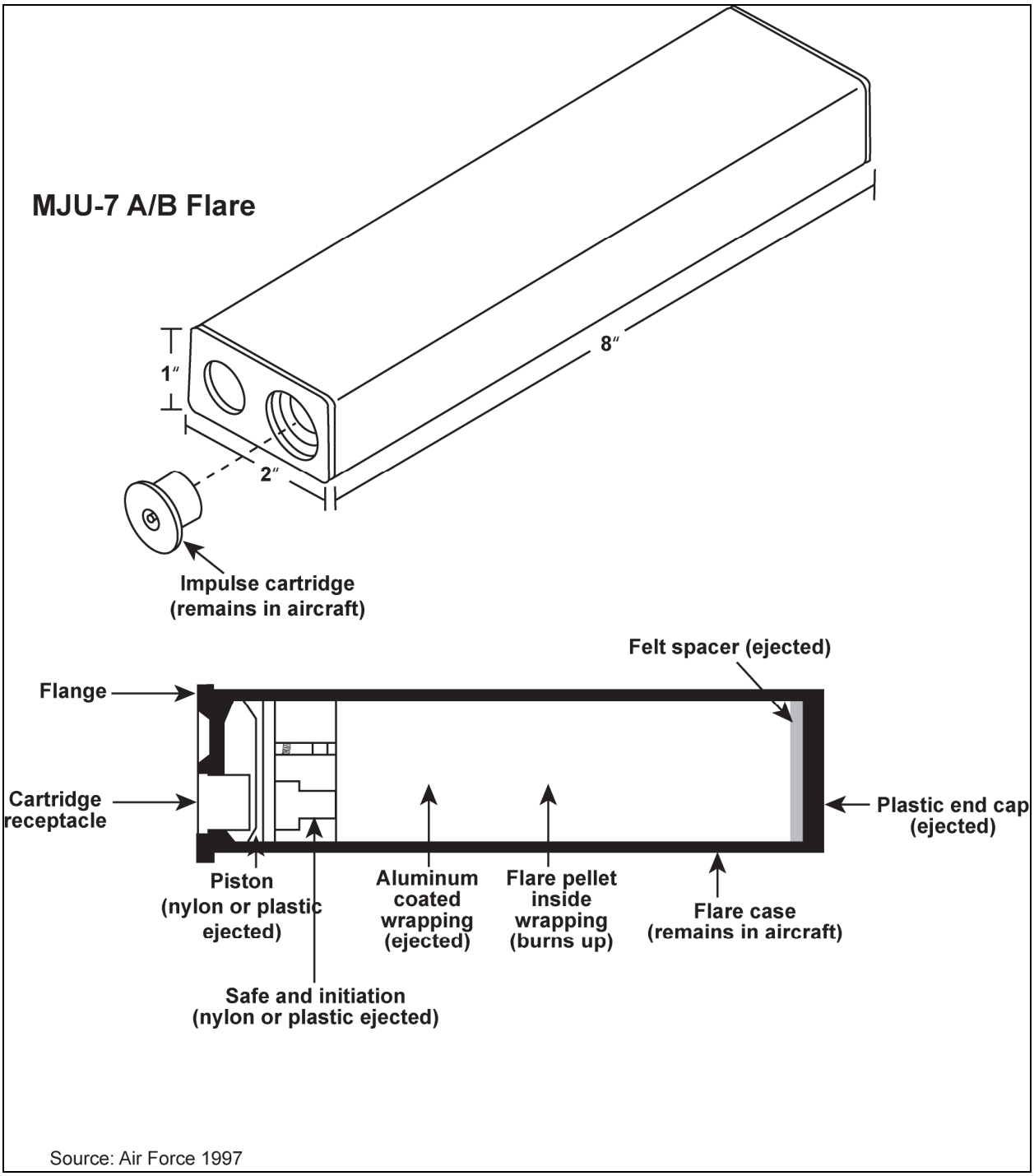


Figure 6. ALA-17 Cutaway



Source: Air Force 1997

Figure 7. MJU-7 A/B Flare

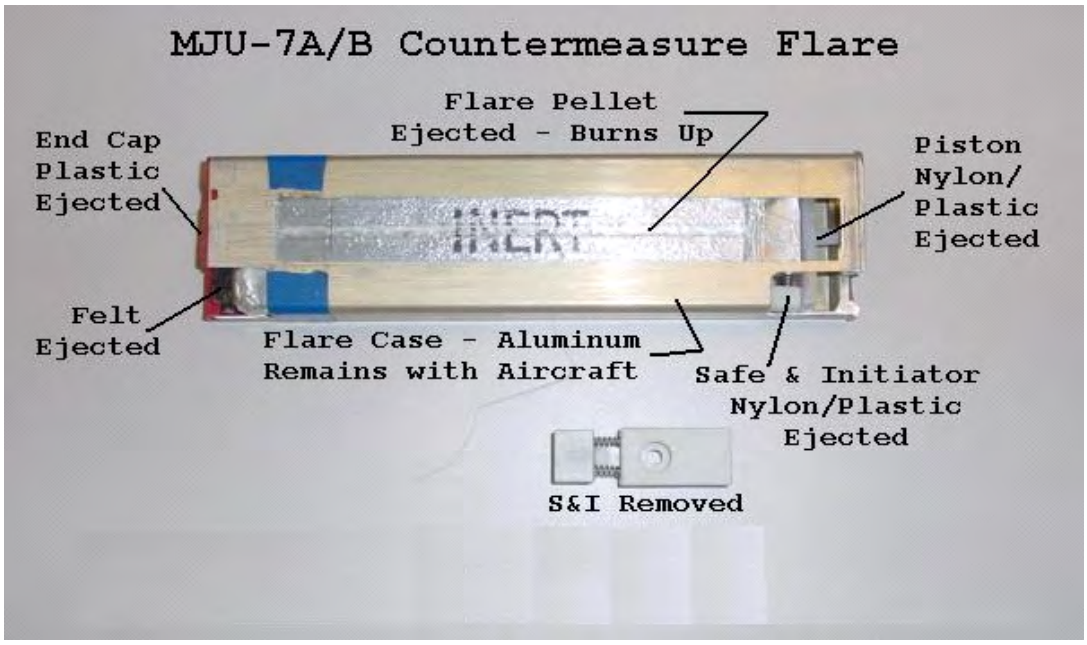


Figure 8. MJU-7 A/B Countermeasure Flare (cut away view)

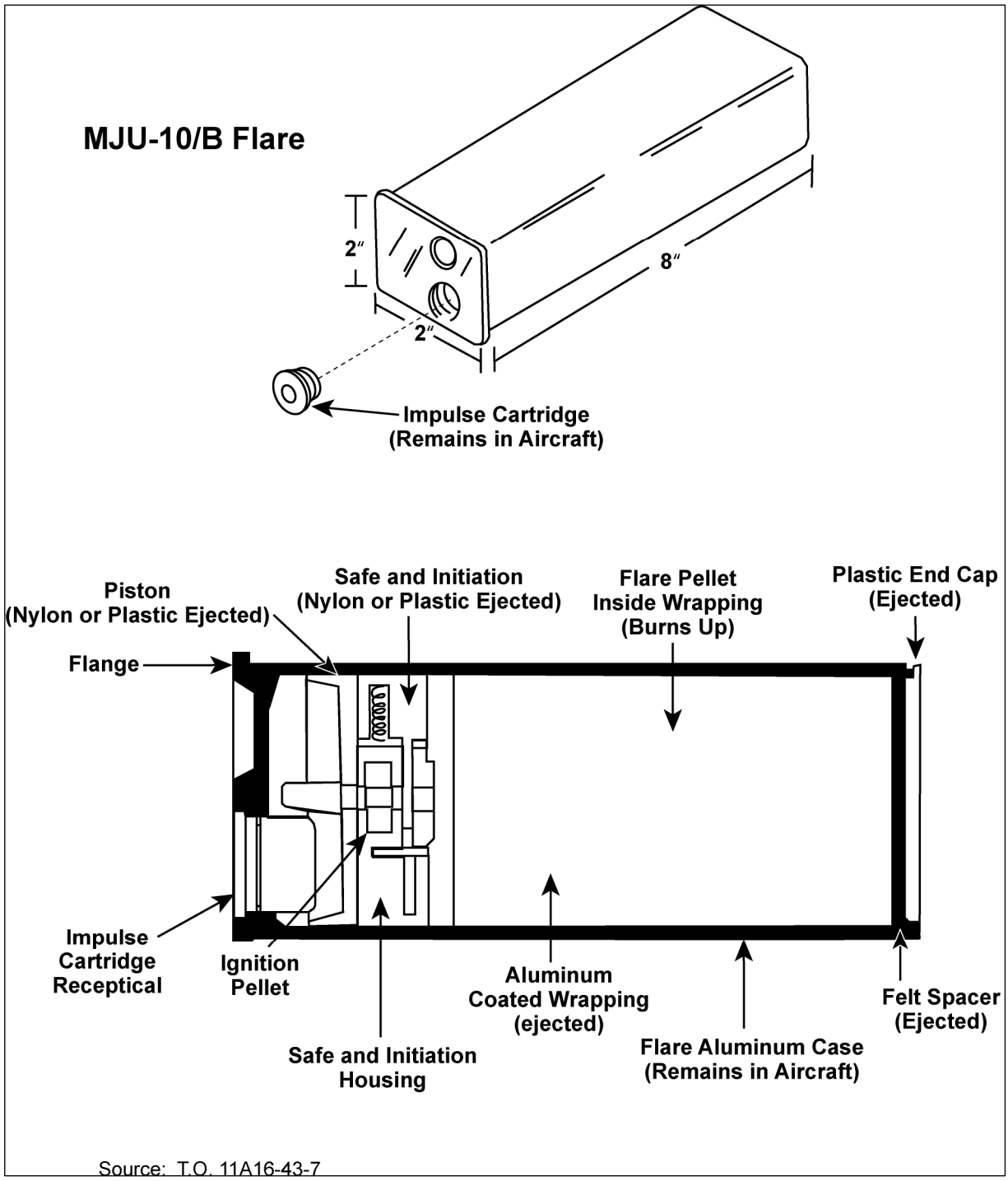


Figure 9. MJU-10/B Flare

Table 2. Description of M-206, MJU-7 A/B, and MJU-10/B Flares

Attribute	***M-206***	***MJU-7 A/B***	***MJU-10/B***
Aircraft	F-16, A-10, AC-130, C-17	F-15, F-16, AC-130	F-15, F-22
Mode	Parasitic	Semi-parasitic	Semi-parasitic
Configuration	Rectangle	Rectangle	Rectangle
Size	1x1x8 inches (8 cubic inches)	1x2x8 inches (16 cubic inches)	2x2x8 inches (32 cubic inches)
Impulse Cartridge	M-796	BBU-36/B: MJU-7	BBU-36/B
S&I Device	None	Slider Assembly	Slider Assembly
Weight (nominal)	6.8 ounces	13 ounces	40 ounces
Felt Spacers	1 to 2, 1x1 inch	1 to 2, 1x2 inches	1 to 2, 2x2 inches

Table 3. Typical Composition of MJU-10/B and MJU-7 A/B Self-Protection Flares

Part	***Components***
Combustible	
Flare Pellet	Polytetrafluoroethylene (Teflon) ($-[C_2F_4]_n$ – n=20,000 units) Magnesium (Mg) Fluoroelastomer (Viton, Fluorel, Hytemp)
First Fire Mixture	Boron (B) Magnesium (Mg) Potassium perchlorate ($KClO_4$) Barium chromate ($BaCrO_4$) Fluoroelastomer
Immediate Fire/ Dip Coat	Polytetrafluoroethylene (Teflon) ($-[C_2F_4]_n$ – n=20,000 units) Magnesium (Mg) Fluoroelastomer
Assemblage (Residual Components)	
Aluminum Wrap	Mylar or filament tape bonded to aluminum tape
End Cap	Plastic (nylon)
Felt Spacers	Felt pads (0.25 inches by cross section of flare)
Safe & Initiation (S&I) Device	Plastic (nylon, tefzel, zytel)
Piston	Plastic (nylon, tefzel, zytel)

Source: Air Force 1997

Table 4. Components of BBU-36/B Impulse Charges

Component	*BBU-36/B*
Overall Size Overall Volume Total Explosive Volume	0.740 x 0.550 inches 0.236 cubic inches 0.081 cubic inches
Bridgewire	Trophet A
Closure Disk	Scribed disc, washer
Initiation Charge	
Volume	0.01 cubic inches
Weight	100 mg
Compaction	6,200 psi
Composition	42.5 percent boron 52.5 percent potassium perchlorate 5.0 percent Viton A
Booster Charge	
Volume	0.01 cubic inches
Weight	150 mg
Compaction	5,100 psi
Composition	20 percent boron 80 percent potassium nitrate
Main Charge	
Volume	0.061 cubic inches
Weight	655 mg
Compaction	Loose fill
Composition	Hercules #2400 smokeless powder (50-77% nitrocellulose, 15-43 percent nitroglycerine)

Source: Air Force 1997

3.0 ENVIRONMENTAL EFFECTS OF FLARES

3.1 Flare Reliability

Initial concerns regarding defensive training flare use focused on questions of flare reliability, fire risk, and flare emissions. Flare reliability is important because a flare failure could have a variety of environmental consequences. Reliability is determined by testing the flares after manufacture. Flare testing consists of selecting 80 flares randomly from a lot of several thousand flares. Lot acceptance testing for the MJU-7 A/B, the most heavily used flare, examines the success of ignition and burn, pellet breakup, and indication of dispenser damage. The specification requires that a flare lot pass an ignition and ejection test. In this test, with a sample size of 80, two failures would be acceptable, but three failures would result in the entire flare lot being rejected (Air Force 1997). To ensure that good lots are not erroneously rejected in these tests, the flares would have to be designed to a reliability of 99 percent (assuming a confidence level of 95 percent). Therefore, the reliability of the MJU-7 A/B flare is expected to be approximately 99 percent. Other factors are required to achieve comparable levels of reliability. Flares are manufactured to avoid rejection of the entire lot. These levels of reliability are reasonable when the purpose of the flare is taken into consideration. A flare is designed to protect life and a multi-million dollar investment.

3.2 Flare Failures

There are four different types of flare failure. One failure would be if the flare was electrically triggered but did not release and did not burn. Such a flare would be treated as unexploded ordnance (UXO) when the aircraft returned to the base, and the flare would be removed for disposal.

A second type of flare failure would be if the flare burned but did not release from the aircraft. This would be an extremely dangerous situation for the pilot. There is one known case of this occurring; in 1980, an F-102 aircraft was destroyed and the pilot ejected. Reliability of flare ignition and deployment has been substantially improved since then.

A third type of flare failure would be a released flare at an improper altitude or that did not burn correctly. If a burning flare struck the ground, it could result in a fire, with potential environmental consequences. If a broken part of a flare struck the ground, it would not burn unless subject to temperatures or friction generating temperatures in the one to two thousand degree range.

A fourth type of flare failure is if a flare was released from the aircraft but did not burn, either in whole or part, and becomes a dud flare on the ground. There are two potential locations for a dud flare: on or off military-controlled land. Military-controlled land includes the base airfield where, at times, an unburned flare (the first type of failure) is jolted out of its container during a landing and becomes a dud flare (the fourth type of failure) on or adjacent to the runway. Military-controlled land also includes training ranges over which flares are deployed. Non-military controlled land includes lands managed by other governmental agencies and private lands.

The first type of flare failure results in an unburned flare returning to the base. This would be handled as UXO and would not normally be treated as a potential environmental impact. The second type of flare failure is an extremely rare case of a flare causing a Class A accident with loss of an aircraft and possibly a life. Such a situation would be quantified in terms of flight safety and would be part of the documented Class A accident rates for the specific aircraft. As noted above, there is only one documented case of this type of flare failure.

The third type of flare failure is a flare which is still burning when it strikes the ground. Documented cases of this have occurred. Upon investigation, such cases are nearly always the case of a flare being deployed at too low an altitude.

If a flare struck the ground while still burning, it could ignite surface material and cause a fire. This has occurred at active military training ranges where flare- or munitions-caused fires are documented. In all known cases, the flares burning when they struck the ground were released at a very low altitude. Table 5 presents the time-to-distance for a falling object, such as a flare. Release at an altitude below 300 feet has the potential for a flare that burns in 4 to 5 seconds to still be burning when it strikes the ground. On active military ranges, firebreaks are established to reduce the potential for fires to spread off the range.

The best way to reduce the risk of flare-caused fires is to establish adequate minimum altitudes for flare release. In 8 seconds, a flare would fall approximately 1,000 feet. An M-206 or an MJU-7 A/B flare is designed to burn out within 150 to 400 feet. Where flares are deployed at a minimum altitude of 1,500 feet above the ground, the likelihood of a flare-caused fire is substantially reduced. In areas where flares are used within training airspace over public or private lands, the minimum altitude for flare deployment is typically between 1,500 to 2,000 feet above ground level (AGL).

Table 5. Flare Burn-out Rate and Distance

Time (in Sec)	*Acceleration*	*Distance(in feet)*
0.5	32.2	4.025
1.0	32.2	16.100
1.5	32.2	36.225
2.0	32.2	64.400
2.5	32.2	100.625
3.0	32.2	144.900
3.5	32.2	197.225
4.0	32.2	257.600
4.5	32.2	326.025
5.0	32.2	402.500
5.5	32.2	487.025
6.0	32.2	579.600
6.5	32.2	680.225
7.0	32.2	788.900
7.5	32.2	905.625
8.0	32.2	1030.400
8.5	32.2	1163.225
9.0	32.2	1304.100
9.5	32.2	1453.025
10.0	32.2	1610.000

Note: Initial velocity is assumed to be zero.

3.3 Dud Flares

The fourth type of flare failure is a dud flare on the ground. A dud flare on nonmilitary land, either public or private land, has the potential to produce environmental consequences. United States (U.S.) military training ranges where flares are used were contacted to estimate the potential for locating a dud flare on the ground. The military has personnel experienced with UXO who survey military ranges to identify and remove live ordnance or dud flares. Experience from the Goldwater Range in Arizona

and the Utah Test and Training Range identified very few dud flares on the ground. The surveys were not scientific studies that evaluated the entire military training ranges, but did survey areas within which 95 to 99 percent of the UXO would be expected. In areas where approximately 200,000 flares had been deployed, an estimated 18 duds were found on the ground. This calculates to a ratio of approximately 1 in 10,000.

There is no instance of a dud flare or any flare debris striking an individual. A dud M-206 flare would be an approximately 3/4 pound piece of material falling at a speed of over 100 miles per hour. It is extremely unlikely that an individual could be struck by such a falling object, but if someone were, it could cause severe injury or death. Dud flares are extremely rare, but they are dangerous.

Although very few dud flares would be expected on the ground, and fewer would be expected to be found, any located dud flare should be treated as UXO. Figure 10 is approximately 40 percent of an M-206 flare and wrapping that did not burn. Apparently, during deployment, the M-206 flare pellet broke before it was completely ignited and the unburned portion was deposited on the military training range. A dud flare would probably not ignite even in a campfire unless it was on a very hot bed of coals. If a dud flare were shot with a bullet or cut with a power saw, the friction could cause it to ignite. If a dud flare were struck by an ax, it is unlikely, but possible, that an ignition could occur. Should a flare be ignited, it would burn at a temperature of 2,000°F and could result in severe injury or death.

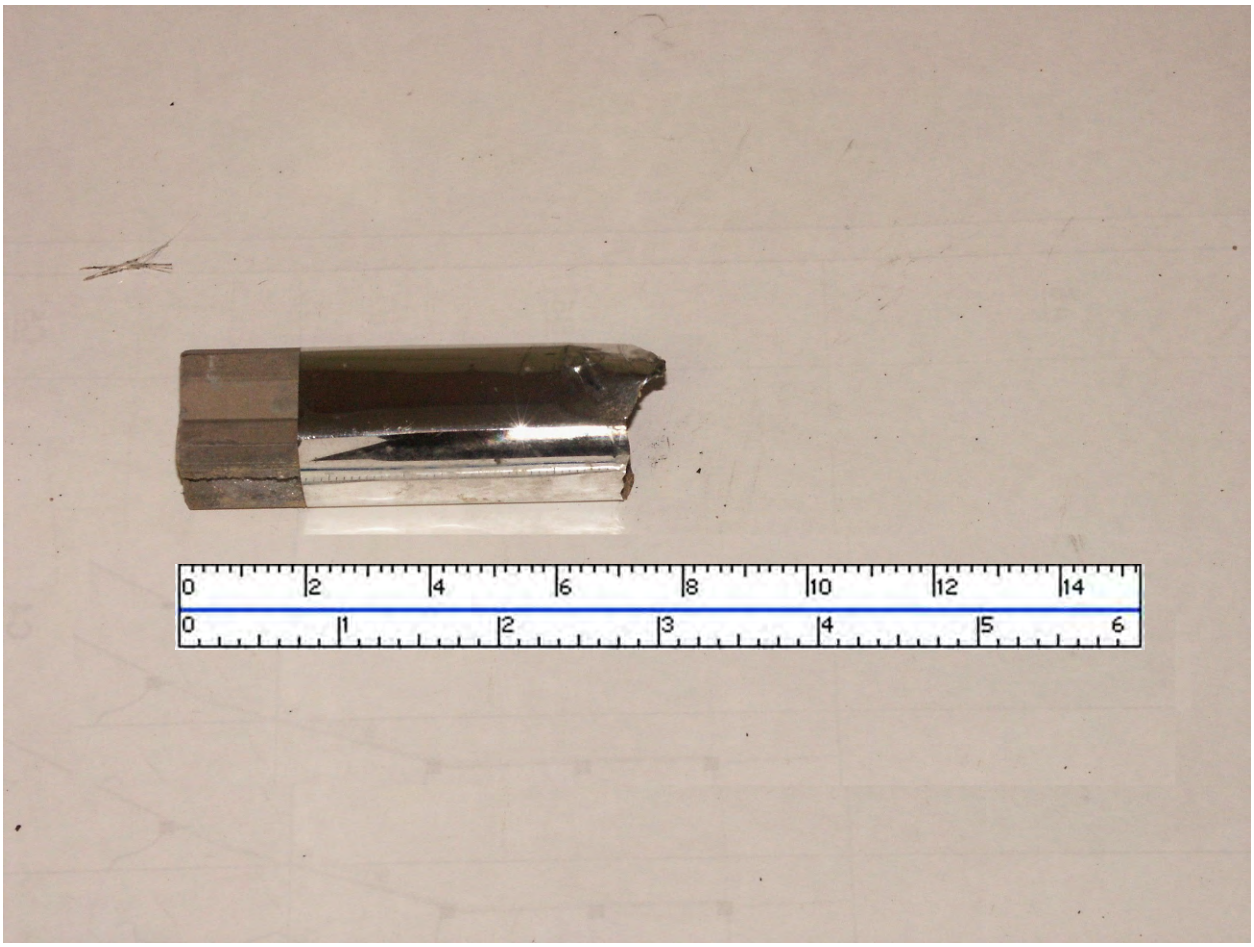


Figure 10. Approximately 40 Percent of an M-206 Flare

The primary environmental message for anyone in the public finding a dud flare (an extremely unlikely event) is: mark its location but do not touch it. The likelihood of finding a dud flare is extremely remote, and the likelihood of a dud flare igniting is even more remote, but because there would be dud flares on the ground under the airspace, someone has the potential to come upon one. The message is: do not touch it; tell an authority about its location.

The number of dud flares on the ground is few. If a dud flare fell in a water body, it would deteriorate over time. The chemicals released during deterioration would not be expected to be of sufficient quantity to cause a noticeable reduction in the water quality or impact upon marine resources.

3.4 Flare Emissions

Environmental questions have also been raised regarding flare emissions, including flare ash. Studies on ash components were performed by measuring residual materials after flares were ignited in a furnace (Air Force 1997). Constituents from combustion were identified, and a worst case scenario was estimated to calculate whether flare emissions or flare ash could result in an environmental impact.

The M-206 and MJU-7 A/B do not contain lead although some earlier flares had lead in the firing mechanism, and some flares still contain chromium in the firing mechanism. A statistical model was used to calculate emission concentrations of lead and chromium with the goal of learning what level of flare emissions or ash would be required to achieve toxic levels of lead or chromium. The model calculated that 1.5 million MJU-7 A/B flares would have to be released below an altitude of 400 feet AGL over a 10,000 acre training range before the level of chromium emissions would become a health risk. Approximately 400,000 flares are deployed by Air Combat Command (ACC) aircraft in all ACC training airspace approved for defensive flare training (Air Force 1997). No location has the combination of flare numbers, altitude, and range area. The number of flares is smaller, the minimum release altitude is higher, and the training area is substantially larger. Flare emissions are not now, nor is it feasible that they could become, a health hazard (Air Force 1997).

There are also trace elements of boron in the flare pellet. To achieve a toxic level of boron, flare ash from approximately 4,000 flares would annually need to fall on an acre of land. It would be almost impossible to deposit 4,000 flares on one acre of land. In fact, it would not be possible for a high performance military aircraft to purposefully deposit even one flare on a specific acre of land. Flare emissions and flare ash are not likely to result in measurable air quality or physical effects to the environment.

3.5 Flare Residual Materials

Environmental questions have been raised regarding flare materials which are not consumed during the flare burn and which are deposited on the surface following flare deployment. Table 6 presents the residual materials from representative flares used in PRTC training airspace.

Residual materials identified as MJU-7 wrapping materials are included in Figure 11 with a pen for scale. This is believed to be the wrapping from an MJU-7 A/B flare and was attributed to training aircraft over private property. Range workers were shown residual flare materials and asked to see if they could find such materials on the range. The workers located a variety of residual materials including the materials pictured in Figures 10, 12, and 13. Figure 12 is the piston or nylon slider assembly from an M-206 flare. The M-206 is a parasitic flare where ignition occurs as the flare is discharged. The burn occurs very quickly and parts, such as portion of the wrapping material, may not be consumed. Wrapping material is not a risk, but it can be viewed as a piece of unanticipated debris by anyone finding it on public or private land under airspace assessed for flare use.

Table 6. Residual Material Deposited on the Surface Following Deployment of One Flare

	FLARE TYPE			
Material	***M-206***	***MJU-7/B***	***MJU-10/B***	***MJU-23/B***
End Cap	One 1 inch x 1 inch x 1/4 inch plastic or nylon	One 2 inch x 1 inch x 1/4 inch plastic or nylon	One 2 inch x 2 inch x 1/4 inch plastic or nylon	One 2 3/4 inch diameter x 1/4 inch thick round plastic disc
Piston	One 1 inch x 1 inch x 1/2 inch plastic or nylon	One 2 inch x 1 inch x 1/2 inch plastic or nylon	One 2 inch x 2 inch x 1/2 inch plastic or nylon	One approximately 2 3/4 inch diameter x 1/2 inch aluminum (or plastic) piston
Spacer	One or two 1 inch x 1 inch felt	One or two 2 inch x 1 inch felt	One or two 2 inch x 2 inch felt	One 1/2 inch thick x 2 3/4 inch diameter rubber shock absorber sealant, two (1/8 inch x 2 3/4 inch diameter) felt discs, up to four 1 inch x 10 inch felt strips
Wrapping	One up to 2 inch x 17 inch piece of aluminum-coated stiff duct-tape type material	One up to 3 inch x 17 inch piece of aluminum-coated stiff duct-tape type material	One up to 4 inch x 17 inch piece of aluminum-coated stiff duct-tape type material	One up to 4 1/2 inch x 20 inch piece of aluminum-coated stiff duct-tape type material
S&I Device	N/A	One 2 inch x 1 inch x 1/2 inch nylon and plastic spring device	One 2 inch x 1 inch x 1/2 inch nylon and plastic spring device	One 2 inch x 1 inch x 1/2 inch nylon and plastic spring device

Figure 11. MJU-7 Residual Flare Wrapping Materials

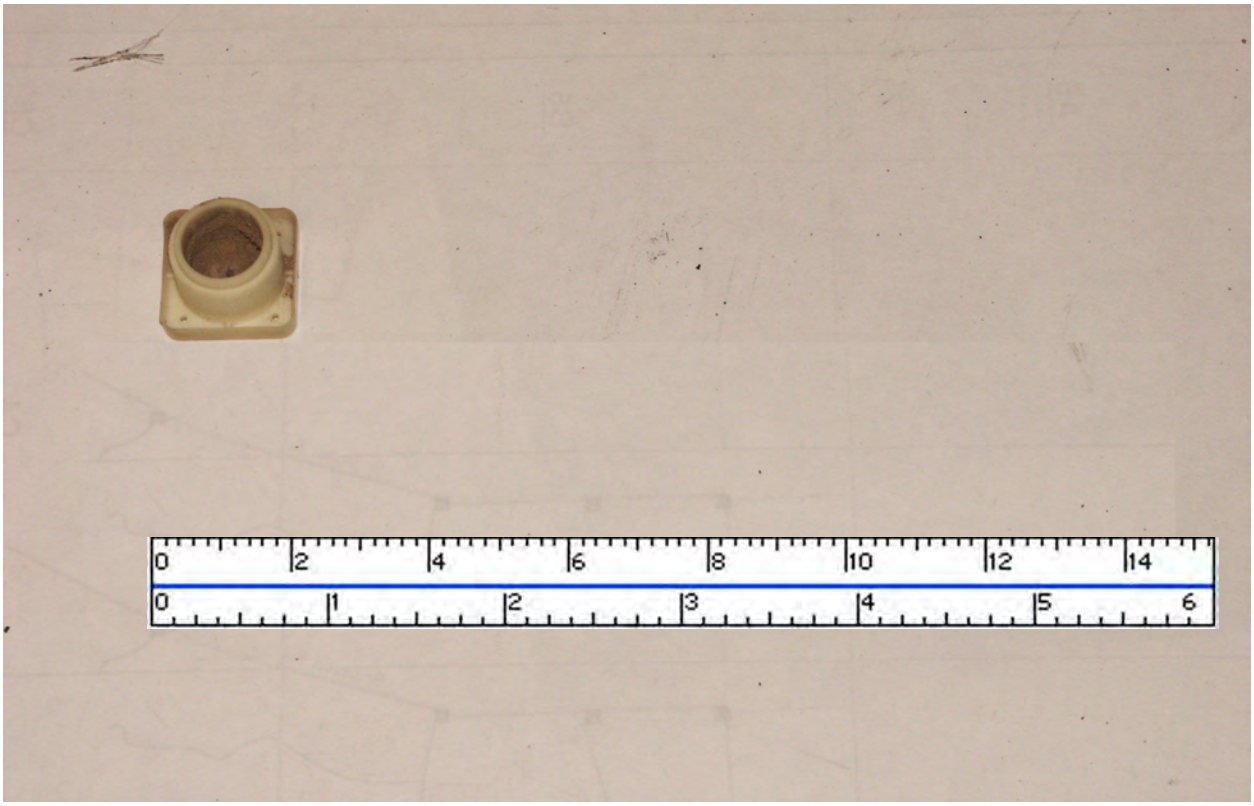


Figure 12. M-206 Piston

The weight of flare residual materials is of interest to assess whether the materials represent a safety risk. Weights of residual components for representative flares are presented in Table 7. The M-206 piston and felt cushion together weigh approximately 0.06 ounces. The M-206 and MJU-7 A/B wrapping materials have a high surface-to-weight ratio and do not fall with much force. The heaviest residual component is the S&I device used in several flares (Table 6). Each S&I device weighs about .07 to .08 ounces depending upon material which may be melted to the S&I device. Two S&I devices are pictured in Figure 13 with some melted fibers from the wrapping material attached.

Table 7. M-206 and MJU-7 A/B Component Weights

Component	***Weight***
M-206	
Plastic end cap	0.08896 ounces
Piston and cushion assembly	0.06271 ounces
Felt spacer	0.01896 ounces
Wrapper (2 inches x 13 inches)	0.3135 ounces
MJU-7 A/B	
End cap	0.10500 ounces
S&I Device (clean)	0.6606 ounces
Piston	0.10500 ounces
Felt spacer	0.01604 ounces
Wrapper (3 inches x 13 inches)	0.4696 ounces

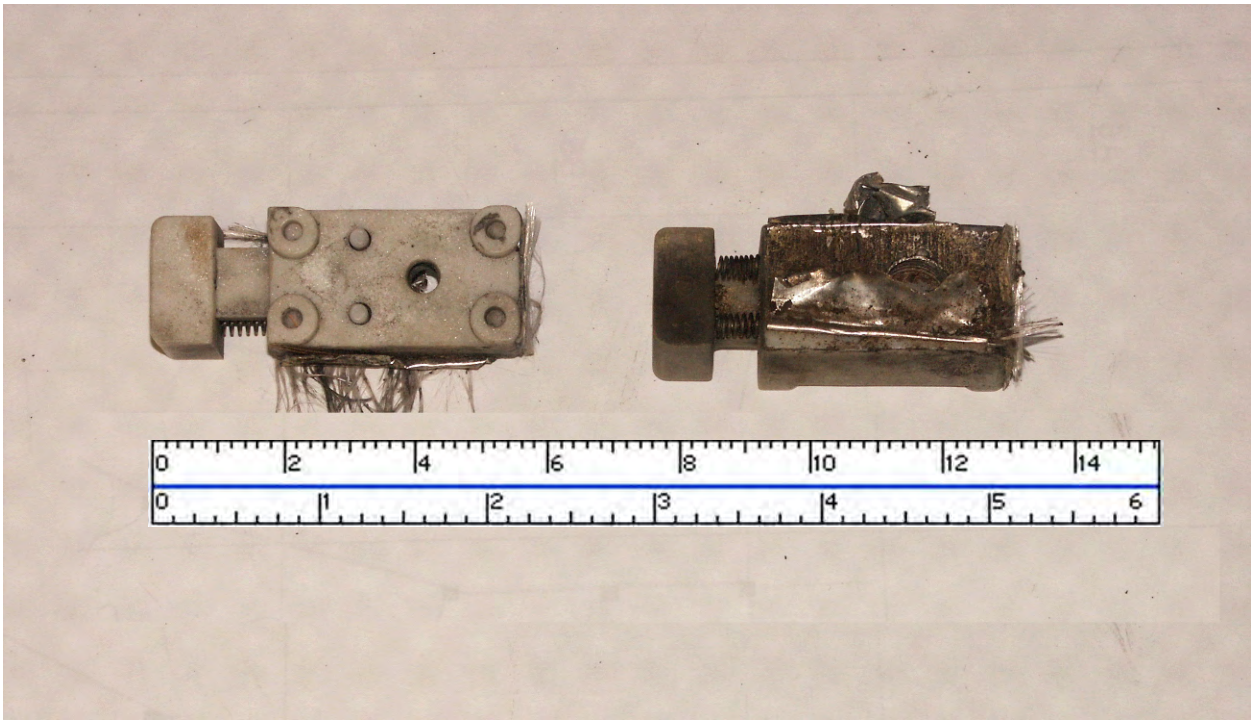


Figure 13. Two S&I Devices Used in MJU-10/B, and Other Flare Types

Calculations were made that take into consideration the weight and surface area of the S&I device. At gravitational rates of acceleration, an S&I device could strike the ground at a momentum of from 0.08 to 0.16 pounds per second (see Table 8). By comparison, if an element with a momentum of 0.1 pounds per second were to strike an individual's unprotected head, there is a one percent possibility of a concussion (Air Force 1997). This means that if an S&I device struck an unprotected individual with no hat, it could cause injury comparable to that of a marble-sized hailstone.

Table 8. MJU-7 A/B Component Hazard

	Maximum Surface Area		
Component	***Area (in^2)***	***Terminal Velocity (ft/sec)***	***Momentum (lb-sec)***
S&I Device	1.65	58	0.08
Piston	1.65	23	0.005
End Caps	2.0	21	0.005
	Minimum Surface Area		
S&I Device	0.413	115	0.16
Piston	0.413	46	0.01
End Caps	0.125	84	0.02

Table 9 quantifies how often an S&I device could be expected to strike a structure, a vehicle, or a person. The assumptions behind this table are that approximately 2,000 MJU-7 A/B-type flares would be annually deployed over an area of 2,000 square miles with a population of one person per square mile. Based on studies performed in the U.S., individuals were, in aggregate, out of doors and

unprotected, with no hat, approximately 10 percent of the time (Tennessee Valley Authority 2003, Klepeis *et al.* 2001). Other assumptions are 2.7 persons per family and 2 structures plus 2 vehicles per family. In an area with one person per square mile and these assumptions, there would be an expected structure hit once in 13 years by a hailstone-sized S&I device under the airspace where MJU-7 A/B flares were used for training. No damage would be expected to the structures.

Table 9. S&I Device Potential Annual Strikes

Persons Per Square Mile	*Structure*	*Vehicle*	*Person*
0.1	.0075	0.00005	0.0000025
1.0	.075	0.0005	0.000025
10.0	.75	0.005	0.00025

Table 9 can be used to calculate other population densities and other exposures of a population. For example, if there were a population of one person per square mile with all individuals unprotected one hundred percent of the time (living out of doors with no hat or 10 times the table), there would be an expected 0.00025 person struck by an S&I device annually or one person in 4,000 years. These results demonstrate that it is very unlikely that an individual could be struck by one of these objects with the force of a large hailstone, and if a person were struck on an unprotected head, there would be an approximately one percent chance of a concussion.

Some of the flare materials which fall to the surface after deployment are larger than an S&I device. Table 6 lists larger pieces from the MJU-10/B and MJU-23/B flares, including the end caps and wrapping. The surface to mass ratio of most of these pieces would not be expected to permit the pieces to achieve a terminal velocity as great as the S&I device. Some parts, such as the ALA-17A/B flare debris include the entire bottom cylinder assembly, as well as the end cap and felt spacers from the top flare. The debris from an ALA-17A/B flare could fall in an orientation that the terminal velocity could produce a momentum in the 0.10 to 0.20 range. The relative low use of these flares reduces potential risk from the bottom cylinder assembly. ACC units are estimated to annually use fewer than 4,000 of these flares worldwide.

End caps, felt spacers, sliders, and wrapping material fall to the earth with each flare deployed. Most flare types have a plastic S&I device which falls to the ground. These dropped objects are extremely unlikely to pose a risk of injury or environmental damage, but the materials would fall to the ground under airspace where such flares are used in training. Figure 14 is an example of an M-206 flare wrapper on the ground. To the untrained eye, as the wrapping material weathers, the wrapper may have the appearance of a natural object, such as the stick in the foreground. However, individuals finding and identifying these pieces could express annoyance with the residual flare materials.

Figure 14. A Flare Wrapper Partially Covered by Pine Needles.

4.0 FLARE CONCLUSIONS

Section 2.0 describes typical flares used regularly or intermittently in PRTC-scheduled training airspace. The environmental consequences of realistic military training with flares can be summarized as:

- The risk of a fire can be greatly reduced through adjusting the minimum altitude for deployment of self-protection flares. There is still the possibility of a mistake where a flare could be deployed at too low an altitude, but establishing minimum altitudes substantially reduces the potential for that mistake or for a flare-caused fire in the environment.
- Dud flares are infrequent with today's technology. The important environmental piece of information for dud flares is that, if one is found, it should be left where it is, its location should be marked, and authorities should be notified. Environmental analyses could explain that the risk from a falling dud flare striking anything is so low as to be inconsequential. If a dud flare were found, it should not be moved and an authority should be notified.
- There is almost no discernible trace from flare ash. A burning flare can be seen, but there is almost no detectable air or soils pollution that could come from the number of flares burned within a training airspace.
- Residual materials from the M-206, the MJU-7 A/B, MJU-10/B, ALA-17/C, or MJU-23 A/B flares have very little safety risk. Flare debris would have little environmental effect except that it could be an annoyance if found.

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APPENDIX E
PUBLIC INVOLVEMENT AND AGENCY CORRESPONDENCE

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Distribution List for Draft EIS

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		District Ranger	Black Hills National Forest	Northern Hills Ranger District	2014 N Main St	Spearfish	SD	57783
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	Brence Family					Ekalaka	MT	59324
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Rory	Brown Wolf		CRST Cultural Preservation	PO Box 590		Eagle Butte	SD	57625
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Ernest	Clark					Spearfish	SD	57783
Nici Meyer	Clarkson					Bowman	ND	58623
Perry	Clausen		Southwest Airlines	PO Box 36611	HDQ 8FO	Dallas	TX	75235
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Rachel	Court		Senator Jon Tester	222 N 32nd St		Billings	MT	59101
Steve	Craddock					Miles City	MT	59301
Sonja	Crocker					Rosebud	MT	59347
Bonnie	Crow		Bison School	PO Box 9		Bison	SD	57620
Russ	Dahl	President	Montana Pilots' Association	498 BIA RT 1		Nashua	MT	59248
Milo	Dailey		Belle Fourche Post/Bee	614 State St		Belle Fourche	SD	57717
Luann	Dart	Director	Grant County Job Development Authority	PO Box 309		Elgin	ND	58533

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Tom	Davis					Belle Fourche	SD	57717
Tommy	Dawes					Crow Agency	MT	59022
Pat	Dennis	Manager	St. Labre Airport	PO Box 77		Ashland	MT	59003
Al	Dial	Mayor	Box Elder City Hall	520 N Ellsworth Road, #9C		Box Elder	SD	57719
Rod	Diede		Bowman County	107 9th Ave NW		Bowman	ND	58623
Ted	Dilse	Manager/Owner	Dilse Pvt Airstrip Airport	7603 135th Ave SW		Scranton	ND	58653
Delbert	Dinstel		MT Pilots Assoc	PO Box 2484		Colstrip	MT	59323
Patricia L.	Dressler	Environmental Protection Specialist	Bismarck Airports District Office	2301 University Drive Building 23B		Bismarck	ND	58504
Fred	Drga					Ismay	MT	59336
Greg	Dyer		FAA, Denver ARTCC	2211 17th Ave		Longmont	CO	80501
Russell	Eagle Bear	Tribal Historic Preservation Officer	Rosebud Sioux Tribe	PO Box 809		Rosebud	SD	57570
Chuck	Eagleman					Lame Deer	MT	59043
Marge	Eagleman		Bureau of Indian Affairs-NCA	PO Box 40		Lame Deer	MT	59043
Monte	Eayrs					Fallon	MT	59326
Norm	Edwards					Spearfish	SD	57783
Bailey	Egan		MT Pilots Assoc	7 Egan Ln		Forsyth	MT	59327
Gerald	Ellis		Ellis Ranch			Miles City	MT	59301
Jim	Englehart					Bison	SD	57620
Karen	Englehart					Bison	SD	57620
Rich	Erickson	Fire Chief	Rhame Volunteer Fire Department	PO Box 95		Rhame	ND	58651
John & Corinne	Erickson					Bison	SD	57620
Nancy	Espy	Chairman	Powder River County Commissioners	PO Box 200		Broadus	MT	59317-0200
Jeff	Faught		North Dakota Game and Fish Department	100 N Bismarck Expressway		Bismarck	ND	58504
Mike	Ferguson		AOPA	4 Airport Dr		Townsend	MT	59644
Dorothy	Fire Cloud		Devil's Tower National Park	Hwy 110 Bldg 170		Devils Tower	WY	82714
Conrad	Fisher					Lame Deer	MT	59043
Tracy	Fruit					Broadus	MT	59317
Dean	Fulmer		FAA Minneapolis	512 Division St.		Farmington	MN	55024
D. Keith	Gaaskjolen					Meadow	SD	57644
Zachary	Gaaskjolen					Black Hawk	SD	57718
Kevin	Gappert		MT Bureau of Land Management	PO Box 1765		Miles City	MT	59301

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Kevin	Gappert		Bureau of Land Management	111 Garryowen Rd		Miles City	MT	59301
Glenn	Gay		Gay Ranch, Inc.			Broadus	MT	59317
Ray & Linda	Gilbert		South Dakota Stockgrowers	PO Box 166		Buffalo	SD	57720
Kathy	Glines		Harding County	PO Box 26		Buffalo	SD	57720
Pete	Gober	Field Supervisor	U.S. Fish and Wildlife Service	South Dakota Ecological Services Field Office	420 S. Garfield Avenue, Suite 400	Pierre	SD	57501-5408
Marvin	Gookin					Baker	MT	59313
Paul	Gremse		Butte County Veterans Service Office	830 6th Ave		Belle Fourche	SD	57717
Richard	Grosskopf		Landmark of Billings, Inc.	1925 Grand Ave, Ste 144		Billings	MT	59102
Jim	Hamilton					Decker	MT	59025
Michael	Hamilton					Sheridan	WY	82801
Greg	Hampshire		Wyoming Dept of Transportation, Aeronautics Division	5300 Bishop Blvd		Cheyenne	WY	82009-3340
Michael	Hannigan		FAA AJR HAAM	2300 E Devon		Des Plaines	IL	60018
Bernard & Catherine	Hansen					Forsyth	MT	59327
Terry & Deborah	Hanson					Miles City	MT	59801
Deborah	Hanson					Miles City	MT	59301
Marian	Hanson					Ashland	MT	59003
Rick	Hanson		Congresswoman Herseth Sandlin	1823 W Main St		Rapid City	SD	57702
Denise	Hartse		Miles City Star	PO Box 743		Miles City	MT	59301
Misty	Hays		U.S. Forest Service	2250 E Richards St		Douglas	WY	82633
Raymond	Hech					Lame Deer	MT	59043
George & Sydney	Hegge				4309 West River Rd	Medora	ND	58645
Robert	Helmer					Rapid City	SD	57702
John	Helms					Buffalo	SD	57720
Scott	Hemmer					Broadus	MT	59317
Makenzi	Henderson		KOTA-TV	518 St Joseph St		Rapid City	SD	57701-2717
Lynetta	Henderson					Buffalo	SD	57720
Ralph	Henning		MDU Resources Group Inc	PO Box 5650		Bismarck	ND	58506
Brooke	Hershey					Bison	SD	57620
Stephanie	Hester		National Parks Conservation Association	Northern Rockies Regional Office	PO Box 824	Helena	MT	59624
Kenny	Hill		Big Horn, Inc.	4831 US Hwy 82 West		Ty Ty	GA	31795

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Jill	Hill					Tifton	GA	31793
Milas & E.A.	Hills					Colstrip	MT	59323
Virginia	Hoenke					Ismay	MT	59336
Alice	Holcomb					Buffalo	SD	57720
Bob	Hollister		MT Pilots Assoc	Box 1211		Forsyth	MT	59327
Clayton	Hornung	Mayor	City of Baker	PO Box 1512		Baker	MT	59313
Paige	Hoskinson Olson	Review and Compliance Coordinator	Department of Tourism and State Development	711 E Wells Avenue		Pierre	SD	57501-3369
Marc	Hotchkiss					Reva	SD	57651
Gary	Huckins					Miles City	MT	59301
Ron	Jablonski		U.S. Forest Service	99 23rd Ave W, Ste B		Dickinson	ND	58601
Jim	Jandreau		Bear Butte State Park	PO Box 688		Sturgis	SD	57785
Jerry	Janurin		Aerial Hunting	HC 67 Box 23		Buffalo	SD	57720
Jerry	Jeffers		Bowman-Slope Soil Conservation District	PO Box 920		Bowman	ND	58623
Ray	Jilek	Manager	Black Hills-Clyde Ice Field Airport	300 Aviation Pl.		Spearfish	SD	57783
Gary	Johnson		Buffalo Town Board	Box 66		Buffalo	SD	57720
Sheldon	Johnson					Sheridan	WY	82801
Phil & Peggy	Johnson					Fort Shaw	MT	59443
Russell & Cara	Jorgensen					Forsyth	MT	59327
Marvin	Kammeren					Rapid City	SD	57701
Marvin	Kammerer					Rapid City	SD	57701
Charles	Kane		SR Cattle Co.			Sheridan	WY	82801
David	Kane	President	Sheridan County Stockgrowers			Decker	MT	59025
Rod	Kelly		Kelly Ranch			Ismay	MT	59336
Rex	Kelsch		Mott Airport Authority	PO Box 236		Mott	ND	58646
Jackie	King		U.S. Rep. Barbara Cubin	Box 44003		Casper	WY	82620
William	Koepplin					Elgin	ND	58553
Shane & Kathy	Kolb					Meadow	SD	57644
Steve	Kozel		U.S. Forest Service	Box 680		Sundance	WY	82729
L.A. & Norma	Kraemer					Deadwood	SD	57732
Anna	LaBree					Ekalaka	MT	59324
Bruce	Lambert		Ekalaka Eagle Newspaper	PO Box 66		Ekalaka	MT	59324
Sylvia	Lamberth					Interior	SD	57750-0078

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Bob	Lamond		NBAA	5300 Lindsay St		Fairfax	VA	22032
Bill & Katie	Lane		Crescent Cross Ranch			Ismay	MT	59336
Thomas	Lane		Rancher's for the Environment	Box 1238		Livingston	MT	59047
Darin	Langerud	Director	North Dakota Atmospheric Resource Board	900 E Boulevard Ave, Dept 410		Bismarck	ND	58505-0850
Danny	Lanning	Owner	Lanning Ranch Airport	200 Lanning Trail		Alzada	MT	59311
Gene	Larson					Miles City	MT	59301
Robin	LeBeau					Eagle Butte	SD	57625
Kenneth	Lee					Sturgis	SD	57785
Pete	Lehmann	Government Analyst Air Traffic Services	Aircraft Owners and Pilots Association	421 Aviation Way		Frederick	MD	21701-4798
Fred	LeLacheur	Senior Airport Engineer	Morrison-Maierle Inc.	1 Engineering Place		Helena	MT	59602
Marcia	Leslie					Sheridan	WY	82801
Aaron	Levorsen					Elgin	ND	58533
Carlton	Levorsen					Elgin	ND	58533
Kelly	Lorge					Bowman	ND	58623
Thomas	Lubnau II	Representative	State Representative	4 Cherokee Circle		Gillette	WY	82718
Tom	Luoma					Baker	MT	59313
Tom	Lutey		Billings Gazette	PO Box 36300		Billings	MT	59107-6300
Joe & Kandi	Luther					Big Horn	MT	59010
Dave	Madel					Biddle	MT	59314
Jim	Magagna	Executive Vice President	Wyoming Stock Growers Assoc	PO Box 206		Cheyenne	WY	82003
Mel & Eleanor	Marousek					Belle Fourche	SD	57717
Gary J.	Martin					Glasgow	MT	59230
Phillip	Mason					Sundance	WY	82729
Mark	Masters		Bureau of Indian Affairs-Fire	PO Box 40		Lame Deer	MT	59043
Tim	Matuszewski		United Airlines	1200 E Algonquin Rd.		Elk Grove Village	IL	60007
William	Mayo		Mayo Aviation	Box 544		Colstrip	MT	59323
John	McAulay		McAulay Ranch			Terry	MT	59349
Jimmy & Erna	McClure					Sheridan	WY	82801-0744
Pat	McElgunn		Rapid City Chamber of Commerce	PO Box 747		Rapid City	SD	57709
Elizabeth	McFarland		U.S. Forest Service	PO Box 168		Ashland	MT	59003
Lloyd	McKeown					Rhame	ND	58651
Roger	Meggers	Manager	Baker Municipal Airport	315 4th St SW		Baker	MT	59313

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Darin	Meggers		Baker Air Service	PO Box 979		Baker	MT	59313
Frank & Charlene	Mehling		Medicine Rocks Ranch			Baker	MT	59313
Stan	Michals		GFP	3305 W South		Rapid City	SD	57702
Kyle	Michels					Elgin	ND	58533
Robert	Miller		North Dakota Aeronautics Commission	Box 64		Casselton	ND	58012
John	Miller	Surface Water Quality Program	SD DENR PMB 2020	Joe Foss Building	523 E Capitol	Pierre	SD	57501
Sheri	Miner		Tribal Land Office	PO Box 590		Eagle Butte	SD	57625
Bob	Morland		Bowman County Airport	15 S Main		Bowman	ND	58603
Charles	Murphy	Chairman	Standing Rock Sioux Tribal Council	PO Box D		Fort Yates	ND	58538
Dan	Nelson					Meadows	SD	57644
Jack	Nesbit		Custer County	1010 Main St		Miles City	MT	59301
Gary	Ness		ND Aero Commission	Box 5020		Bismarck	ND	58502
Myra	Niederman		Grant County News	PO Box 100		Elgin	ND	58533
David	Niemi					Buffalo	SD	57720
Kevin	Nolan		FAA, WSA OPS Support (ATA3)	1601 Lind Ave SW		Renton	WA	98057
Steven J.	Obenauer	Manager	Bismarck Airports District Office	Federal Aviation Administration	2301 University Drive, Building 23B	Bismarck	ND	58504
Mary	Ogdahl					Miles City	MT	59301
Lee	Old Bear		Bureau of Indian Affairs - Fire	PO Box 40		Lame Deer	MT	59043
Darrin	Old Coyote					Crow Agency	MT	59022
Allen	Old Horn					Crow Agency	MT	59022
Allen	Olson					Box Elder	SD	57719
Frank & Dianne	O'Neill					Miles City	MT	59301
Tom & Lillian	Ostendorf					Powderville	MT	59345
Merlan	Paaverud, Jr.	State Historic Preservation Officer	State Historical Society of North Dakota	612 East Boulevard Avenue		Bismarck	ND	58505-0830
Dean & Gloria	Parks					Ekalaka	MT	59324
Dean	Pearson		Bowman County	104 1st St NW		Bowman	ND	58623
Kent	Pennington					Big Horn	MT	59010
Donna Rae	Petersen		CRST Cultural Preservation	PO Box 590		Eagle Butte	SD	57625
Ole	Peterson					Colstrip	MT	59323
Ellen	Pfister					Shepherd	MT	59079
Dwight	Pladsen					Rapid City	SD	57702

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Stan	Pope					Bowman	ND	58623
Stephen	Potts		U.S. Environmental Protection Agency, Region 8 - Montana Office	10 W 15th St, Ste. 3200		Helena	MT	59626
Ted & Bonnie	Quade					Broadus	MT	59317
Jeff	Rader					Bozeman	MT	59771
Cindy	Radue					Miles City	MT	59301-9603
Chris	Rankin		U.S. Forest Service	2250 E Richards St		Douglas	WY	82633
Deb	Ranum		Fallon County Commissioners	10 W Fallon		Baker	MT	59313
Michael	Rath					Spearfish	SD	57783
Grove	Rathbun	President	South Dakota Pilots Association	1265 Duffer Drive		Rapid City	SD	57702
Grace	Rea					Bowman	ND	58623
Monte	Reder					Miles City	MT	59301
Steve	Reid		U.S. Forest Service	5765 W Broadway		Missoula	MT	59808
Fred	Reinhardt					Billings	MT	59102
James	Renner					Ismay	MT	59336
Donald	Rieger		Fallon County Commissioners	10 West Fallon	PO Box 846	Baker	MT	59313-0846
Paul	Ringling		Ringling Ranch Ltd Part	PO Box 1029		Miles City	MT	59301
Greg & Mary Jo	Roberts	Manager	Diamond Ring Ranch			Terry	MT	59349
Jerome	Roehrich					New Leipzig	ND	58562
Joell	Romick		Meade County Admin.	1425 Sherman St		Sturgis	SD	57785
Steve	Rosencranz		Carter County Commissioner	470 Larson Loop Rd		Hammond	MT	59332
Dennis	Roth					Elgin	ND	58533
Michael	Ruff					Broadus	MT	59317
Robert & Wilma	Rusley		S-X Ranch			Baker	MT	59313
Dona	Rutherford		Devils Tower National Monument	Box 10		Devils Tower	WY	82714
J.D. & Christi	Ryen					Prairie City	SD	57649
Donald	Sales					Decker	MT	59025
Brad	Sauer					Miles City	MT	59301
Rod	Schaaf					Bowman	ND	58623
James	Schaeffer		Consolidated Power Producers, Inc	PO Box 256		Webster	SD	57274
Teresa	Schanzenbach		Chamber of Commerce	415 5th Ave		Belle Fourche	SD	57717
Duane & Gail	Schatz					Elgin	ND	58533
Evonna	Schelling		Sundance Times	PO Box 102		Moorcroft	WY	82721

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Milo	Schindler					Rapid City	SD	57703
Norman	Schock	Mayor	City of Elgin	309 3rd Ave NW		Elgin	ND	58533
Gary	Schroeder		EAA/CAR	310 St. Francis		Rapid City	SD	57701
Kenny	Schultz					Ekalaka	MT	59324
Brian	Schwend	Manager	Schwend Flying Service	PO Box 45		Forsyth	MT	59327
Jack	Schwend					Rosebud	MT	59347
Sherri	Schwenke		U.S. Forest Service	240 W Century		Bismarck	ND	58501
Jon	Scraper					Fargo	ND	58103
Richard	Seidel					Bison	SD	57620
Craig	Shaver	Chair, Property Rights Committee	South Dakota Stockgrowers Assoc	426 St Joseph St		Rapid City	SD	57701
Rico	Short		FAA, Air Traffic Control Command Center	13600 Eds Dr, #100		Herndon	VA	20175
Wade	Sikorski					Baker	MT	59313
Geri	Small	President	Northern Cheyenne Tribal Council	PO Box 128		Lame Deer	MT	59043
Richard	Smith					Redig	SD	57776
Val	Snyder					Sheridan	WY	82801
Raydelle	Sperle					Reva	SD	57651
Roger	Sprague					Forsyth	MT	59327
Virginia	Sprague					Colstrip	MT	59327
Ashley	Stanhope		Farmers Union Oil Co	Box 1199		Baker	MT	59313
Mark	Stelter		NLEDC	PO Box 52		New Leipzig	ND	58562
Wally	Stephens		Nation's Center News	Box 107		Buffalo	SD	57720
Daryl & Geraldine	Storm					Meadow	SD	57644
Eric	Strohacker		Weather Modification, Inc.	3802 20th St N		Fargo	ND	58102
Ryan	Sundberg		Bureau of Land Management	Box 37 BLM Fire		Camp Crook	SD	57724
Larry	Svoboda	NEPA Program Chief	US Environmental Protection Agency, Region 8	1595 Wynkoop Street		Denver	CO	80202-1129
Adrienne	Swallow	Environmental Protection Specialist	Standing Rock Sioux Tribe	PO Box D		Ft Yates	ND	58538
Larry	Taborsky		North Dakota Aeronautics Commission (NDAC)	2301 University Dr., Building 1652-22	PO Box 5020	Bismarck	ND	58502
Jacob	Tall Bull					Lame Deer	MT	59043
Gary & Jean	Tennant	Owner	Tennant Ranch Airport	HC 59, Box 15		Camp Crook	SD	57724
Dustin	Tenold					Reva	SD	57651
David	Thiele		North Dakota National Guard	Fraine Barracks		Bismarck	ND	58504

First Name	Last Name	Title	Organization Name	Address Line 1	Address Line 2	City	State	Postal Code
Jeff	Tichenor		FAA Denver TRACON	26705 E. 68th Ave		Denver	CO	80249
Greg	Tober		Help Flight	12736 Canyon Creek Rd		Molt	MT	59057
Clarence	Ulmer					Belle Fourche	SD	57717
William & Juanita	Unhoch					Sheridan	WY	82801
Wayne	VanDeGraaff		FAA, SLC ARTCC	700 N 2150 W		Salt Lake City	UT	84116
Trent	VanderBoom		Clear Wind	510 Jackson St		Belle Fourche	MT	57717
J. Liessman	Vantine		Crownbutte Wind Power, Inc	111 5th Ave NE		Mandan	ND	58554
Carl	Venne	Chairman	Crow Tribal Council	PO Box 159		Crow Agency	MT	59022
Charles	Verhulst					Reva	SD	57651
Ben	VerWolf					Broadus	MT	59317
Chuck & Colleen	Vetter					Elgin	ND	58533
Bill	Vroman					Buffalo	SD	57720
Larry	Vroman					Buffalo	SD	57720
Ken	Wabaunsee		U.S. Forest Service	5765 W Broadway St.		Missoula	MT	59808
Dean	Wagner					Ralph	SD	57650
Bob	Walters		CRST Council	PO Box 590		Eagle Butte	SD	57625
Dean	Wang		Bank of Baker	PO Box 739		Baker	MT	59313
Warren	Wash	Manager	Broadus Airport	Box 394		Broadus	MT	59317
Pauline	Webb		West River Eagle	Box 210		Eagle Butte	SD	57625
Jeanne	Whalen		Crook Co. WY Land Use Planning	3961 Hwy 24		Aladdin	WY	82710
Glen	White		Hysham Airport	521 Summit		Hysham	MT	59038
Dennis	White					Forsyth	MT	59327
Marcus	White Bull		U.S. Forest Service	PO Box 37		Camp Crook	SD	57724
Virginia	Whitefeather					Dupree	SD	57623
Dean	Wink		Meade County Commissioner Dist 1	PO Box 137		Howes	SD	57748
Mike	Wobbema		North Dakota National Guard	Fraine Barracks		Bismarck	ND	58504
David	Wolfskill		Eagle Aviation	300 Aviation Pl		Spearfish	SD	57783
Bert & Helen	Woods					Ashland	MT	59003
Jason	Woolston					Baker	MT	59313
Noel	Young					Sheridan	WY	82801
Phyllis	Young					Ft Yates	ND	58538
Clayton	Zacher					Elgin	ND	58533
Penny	Zimmerman		Senator Jon Tester	122 W Towne St		Glendive	MT	59330

Sample IICEP Letters and Distribution Lists

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SAMPLE IICEP LETTER 1

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR U.S. Fish and Wildlife Service
134 Union Blvd
Lakewood, CO 80228

FROM: HQ ACC/A7P
129 Andrews Street, Suite 122
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

2. The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to but not including 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1).

3. The purpose of this correspondence is to initiate informal Section 7 consultation in compliance with the Endangered Species Act (ESA) and to request information regarding federally listed threatened, endangered, candidate, and species proposed for listing under the ESA that occur or may occur in the proposed airspace. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

4. The Air Force is committed to community outreach and recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host public meetings in communities underlying and/or adjacent to the proposed airspace as identified in the meeting flyer at attachment 2. Community meetings are also being coordinated on each Native American Reservation. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

5. To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP at the above address with a copy to SAIC, Dr. Thomas W. Mulroy, 5464 Carpintoria Avenue, Carpinteria CA 93013, not later than August 4, 2008. If you any specific questions about this proposal, please feel free to contact Ms. Linda DeVine at (757) 764-9434, by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

The National Environmental Policy Act guides the PRTC EIS.

NEPA requires federal decision makers to consider potential environmental consequences of proposed actions and reasonable alternatives, including a No-Action Alternative in an EIS. The EIS complies with environmental regulations and documents potential impacts to the natural and human environment.

Resources initially identified for analysis in the EIS include (but are not limited to) the following:

- **Airspace Operations**
  Airspace, Noise, Air Quality, and Safety (ground and air)
- **Natural Resources**
  Physical and Biological Resources
- **Cultural Resources**
  Cultural, Native American, Traditional, and Historic Resources
- **Human Resources**
  Land Use, Quality of Life, Socioeconomics, and Environmental Justice

The EIS Process Timeline

Opportunities for Public Involvement

1. Notice of Intent (NOI) Published in Federal Register
2. **Scoping**
3. Preparation of Draft EIS
4. Notice of Availability of Draft EIS
5. **60-Day Public Comment Period**
6. Preparation of Final EIS
7. Notice of Availability of Final EIS
8. 30-Day Waiting Period
9. Record of Decision

Your input is essential to the environmental analysis process!

Providing Comments

To provide comments, please fill out a comment sheet. Please give your comments to an Air Force representative or place it in the comment box. Comment forms, or your own letter, may also be mailed to:

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

To ensure your comments are considered in the Draft EIS, please submit your comments before ***August 4, 2008.***

Public comments on this Draft EIS are requested pursuant to the NEPA, 42 USC 4321, et seq. All written comments received during the comment period will be made available to the public and considered during EIS preparation. Your provision of private address information with your comment is voluntary. Your private address information will not be released in the EIS or for any other purpose, unless required by law. However, your private address information will be used to compile the mailing list for EIS distribution. Failure to provide such information will result in your name not being included on the distribution list.

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

The United States Air Force is conducting scoping meetings for the PRTC EIS. The Air Force is preparing an EIS to determine the potential environmental consequences of a proposal to expand the Powder River Complex to create the PRTC. The PRTC would allow for more effective use of limited resources and finite flying hours by providing, locally, the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth and Minot AFBs. The options being analyzed could:

1. Restructure and reconfigure the existing PRC Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspace (ATCAA) and add new MOA/ATCAA airspace with a floor of 500 feet above ground level (AGL).
2. Increase sortie-operations (aircraft training) in the new and modified training airspace.
3. Support additional ground-based simulated threat emitters under the MOAs.
4. Authorize use of training chaff and flares throughout the new and modified airspace.
5. Permit supersonic flight above 10,000 feet AGL.

Scoping meetings provide the public an opportunity to learn about the proposed PRTC and provide input into this environmental impact analysis process. The scoping process helps us identify and address community-specific issues and concerns regarding the proposed airspace use.

Meeting Agenda

Open House.....4:00 p.m. - 7:00 p.m.

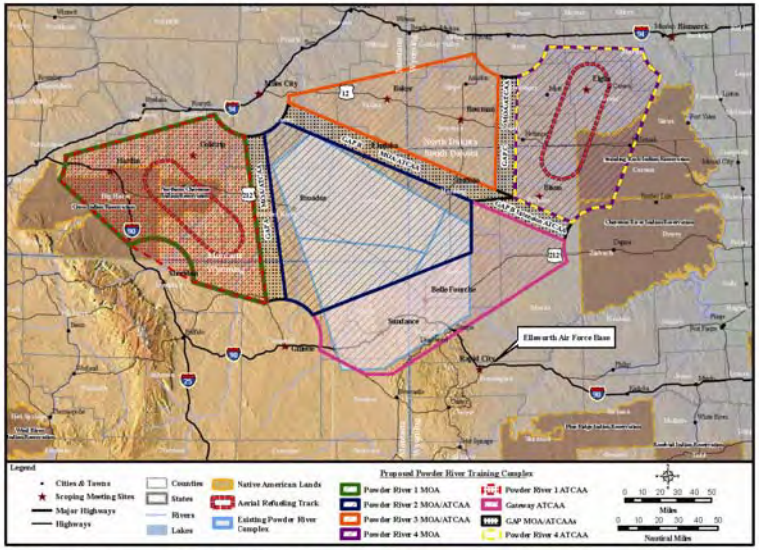
- View video presentation
- Visit information booths
- Discuss proposal with Air Force personnel
- Submit written comments

The Air Force is committed to community outreach and will consider your input to determine the scope of the issues to be addressed and to help identify the significant environmental issues to be analyzed in depth. Your involvement and input are vital to help us focus the environmental analysis.

Why is the PRTC Needed?

- Aircrews need adequately sized, configured, and available airspace to train as they fight during worldwide deployment.
- Increasing training in local airspace optimizes the limited amount of training hours allocated.
- Reducing commute time to remote training ranges like Nevada Test and Training Range (NTTR) reduces fuel consumption.
- Use of chaff and flares allows aircrews to deploy defensive countermeasures as they would in combat.
- Supersonic training assists aircrews to train for show of force and for quick reaction to enemy threats in combat.
- More effectively use limited resources and finite flying hours.

Proposed Alternative A Airspace Changes



The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

Increase Flight Operations: increase number, frequency and variety of sortie-operations.

Employ Large Force Exercises (LFE): use entire proposed PRTC for LFEs of 4 to more than 20 aircraft during scheduled exercises (typically once a quarter).

Support Training Transmitters: support additional ground based simulated emitters under the MOAs.

Permit Supersonic Flight: authorize above 10,000 feet AGL within the proposed PRTC.

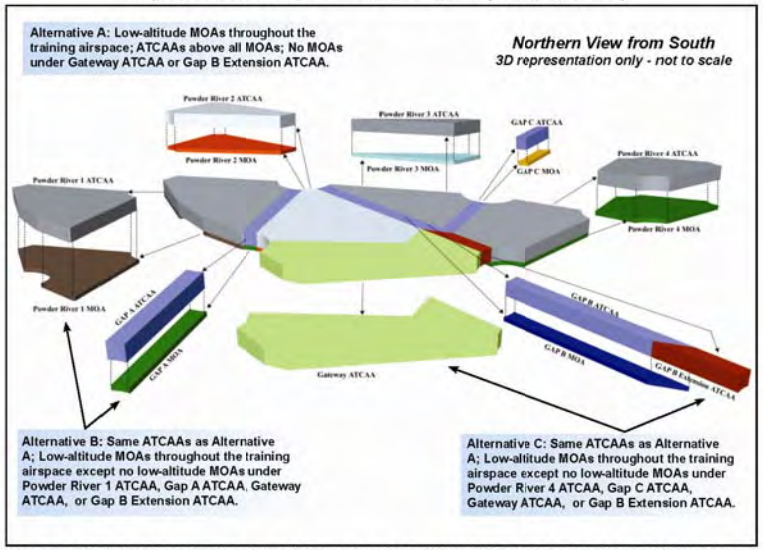
Authorize Defensive Countermeasures: allow training chaff and flare deployment throughout the proposed PRTC.

Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
- Combine and modify existing Crossbow and Powder River 1 ATCAAs to overlie Powder River 2 MOA and rename the ATCAAs - Powder River 2 ATCAA.
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
- Create the Powder River 1, 3, and 4 ATCAAs to connect/correspond with underlying MOAs.
- Establish Gap MOAs and ATCAAs between the Powder River 1, 2, 3, and 4 MOA/ATCAAs.

Proposed Action: Create Powder River Training Complex (PRTC)



All or portions of the following Reservations/counties have the potential of being affected by the training airspace under one or more of the alternatives: ***Montana***: Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***: Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***: Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, and Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

Training aircraft would continue to train in the existing PRC and to overfly parts or all of the following counties: **Montana:** Carter, Custer, Powder River; **South Dakota:** Butte, Custer, Harding, Lawrence, Meade, Pennington; **Wyoming:** Campbell, Crook, Weston.

Training aircraft in high-altitude ATCAAs would continue to overfly approximately 14,100 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would continue to overfly approximately 5,900 square miles.

Powder River

Powder River Training Complex • Environmental Impact Statement

Please Attend!

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Ellsworth Air Force Base (AFB), South Dakota proposes to modify their training airspace.

Please attend a public scoping meeting to:

- ☑ Learn more about the proposal
- ☑ Provide community-specific input
- ☑ Be included on our mailing list

Public Scoping Meetings

Open House 4:00 p.m. to 7:00 p.m.
Public invited to attend at any time. Information will be available throughout.

South Dakota

Rapid City
Monday, June 16, 2008
Rapid City Public Library
610 Quincy Street

Belle Fourche
Tuesday, June 17, 2008
Community Center
(Dakota Room)
1111 National Street

Buffalo
Monday, July 14, 2008
Harding County Memorial
Recreation Center
West Allison Street

Bison
Tuesday, July 15, 2008
Bison School Cafeteria
200 East Carr Street

Wyoming

Sundance
Wednesday, June 18, 2008
Crook County Public Library
414 East Main Street

Gillette
Thursday, June 19, 2008
Campbell County
Fire Department
106 Rohan Avenue

Sheridan
Friday, June 20, 2008
Sheridan Senior Center
North Entrance
211 Smith Street

Montana

Hardin
Monday, June 23
Hardin Chamber of Commerce
10 E. Railroad Street

Colstrip
Tuesday, June 24, 2008
Isabel Bills Community
Learning Center,
520 Poplar Drive

Miles City
Wednesday, June 25, 2008
Miles Community College
2715 Dickinson

Ekalaka
Thursday, June 26, 2008
St. Joan of Arc Parish Hall
Church Street

Broadus
Friday, June 27, 2008
Powder River County District
High School
500 North Trautman

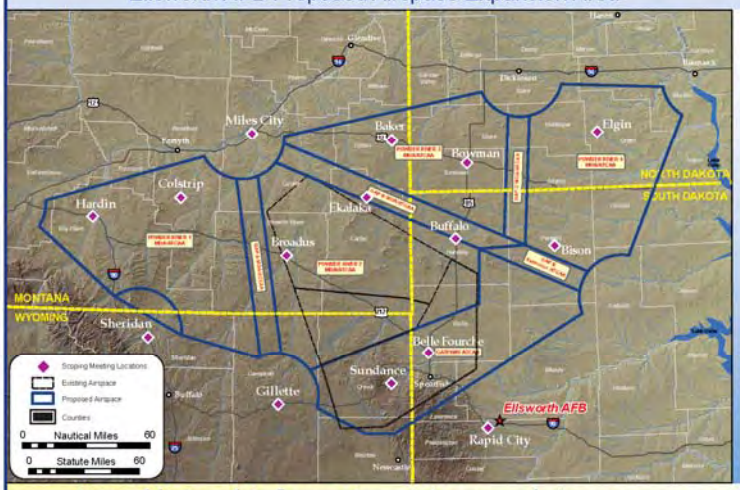
Baker
Tuesday, July 8, 2008
Baker High School
1015 South Third Street West

North Dakota

Bowman
Wednesday, July 9, 2008
City Hall Meeting Room
101 1st Street Southwest

Elgin
Thursday, July 10, 2008
Elgin Community Center
305 North Main Street

Ellsworth AFB Proposed Airspace Expansion Area



For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

Ms. Linda DeVine
EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

DISTRIBUTION LIST

U.S. Fish and Wildlife Service
South Dakota Ecological Services Field Office
420 S. Garfield Avenue, Suite 400
Pierre, SD 57501-5408

U.S. Fish and Wildlife Service
Wyoming Ecological Services Field Office
5353 Yellowstone Road, Ste. 308A
Cheyenne, WY 82009-4178

U.S. Fish and Wildlife Service
North Dakota Field Office
3425 Miriam Avenue
Bismarck, ND 58501-7926

U.S. Fish and Wildlife Service
Montana Field Office
585 Shepard Way
Helena, MT 59601

U.S. Fish and Wildlife Service
134 Union Blvd
Lakewood, CO 80228

SAMPLE IICEP LETTER 2

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR State Historical Society of North Dakota
612 East Boulevard Avenue
Bismarck, ND 58505-0830

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

2. The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1).

3. The purpose of this correspondence is to initiate the Section 106 process of the National Historic Preservation Act (NHPA) of 1966 (as amended) in the potentially affected areas. We are in the early stages of gathering information concerning previous archaeological and historic studies for the areas under the affected region. We would appreciate any assistance you could provide in identifying and retrieving this important information, as well as concerns you may have about the potential effects of the proposal on significant cultural resources. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson,

Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

4. The Air Force is committed to community outreach. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host public meetings in communities underlying and/or adjacent to the proposed airspace as identified in the meeting flyer at attachment 2. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. The 28 Bomb Wing Commander at Ellsworth AFB has initiated consultation with the tribal leaders of the Crow, Northern Cheyenne, Standing Rock and Cheyenne River Nations and community meetings are being coordinated on each Native American Reservation. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

5. To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP at the above address not later than August 4, 2008. If you have any specific questions about this proposal, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

The National Environmental Policy Act guides the PRTC EIS.

NEPA requires federal decision makers to consider potential environmental consequences of proposed actions and reasonable alternatives, including a No-Action Alternative in an EIS. The EIS complies with environmental regulations and documents potential impacts to the natural and human environment.

Resources initially identified for analysis in the EIS include (but are not limited to) the following:

- **Airspace Operations**
  Airspace, Noise, Air Quality, and Safety (ground and air)
- **Natural Resources**
  Physical and Biological Resources
- **Cultural Resources**
  Cultural, Native American, Traditional, and Historic Resources
- **Human Resources**
  Land Use, Quality of Life, Socioeconomics, and Environmental Justice

The EIS Process Timeline

Opportunities for Public Involvement

1. Notice of Intent (NOI) Published in Federal Register
2. **Scoping**
3. Preparation of Draft EIS
4. Notice of Availability of Draft EIS
5. **60-Day Public Comment Period**
6. Preparation of Final EIS
7. Notice of Availability of Final EIS
8. 30-Day Waiting Period
9. Record of Decision

Your input is essential to the environmental analysis process!

Providing Comments

To provide comments, please fill out a comment sheet. Please give your comments to an Air Force representative or place it in the comment box. Comment forms, or your own letter, may also be mailed to:

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

To ensure your comments are considered in the Draft EIS, please submit your comments before ***August 4, 2008.***

Public comments on this Draft EIS are requested pursuant to the NEPA, 42 USC 4321, et seq. All written comments received during the comment period will be made available to the public and considered during EIS preparation. Your provision of private address information with your comment is voluntary. Your private address information will not be released in the EIS or for any other purpose, unless required by law. However, your private address information will be used to compile the mailing list for EIS distribution. Failure to provide such information will result in your name not being included on the distribution list.

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

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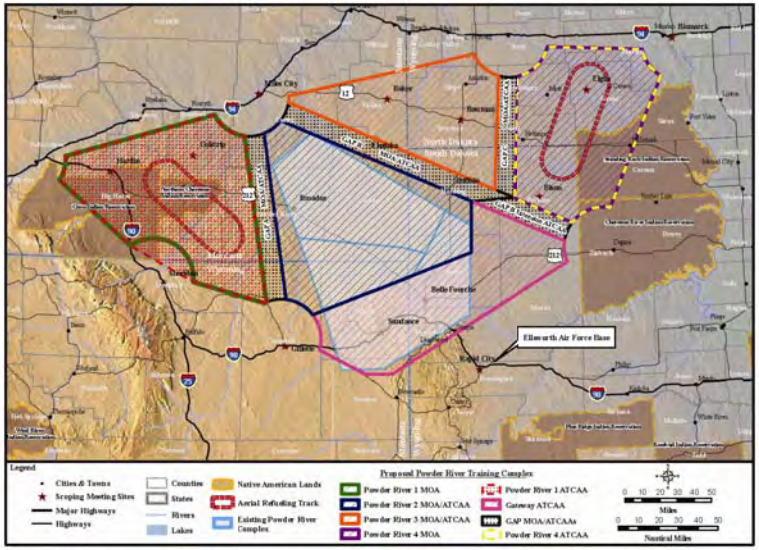
Proposed Alternative A Airspace Changes



The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

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Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
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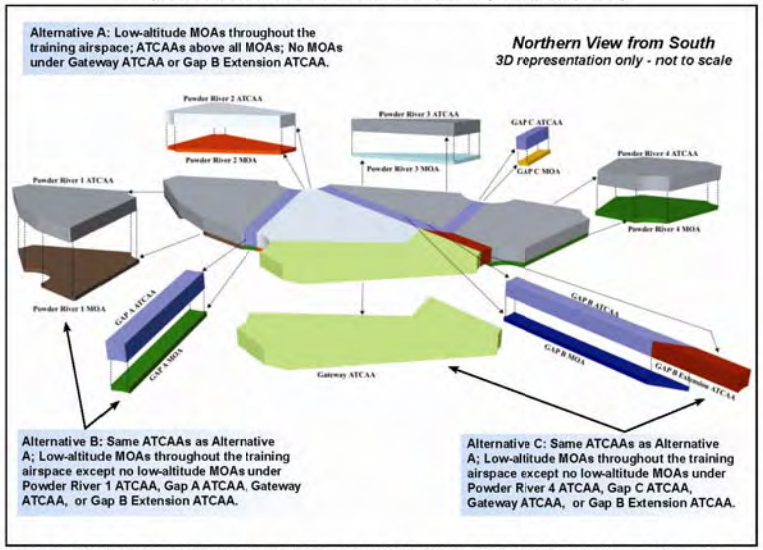
Proposed Action: Create Powder River Training Complex (PRTC)



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Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

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Powder River

Powder River Training Complex • Environmental Impact Statement

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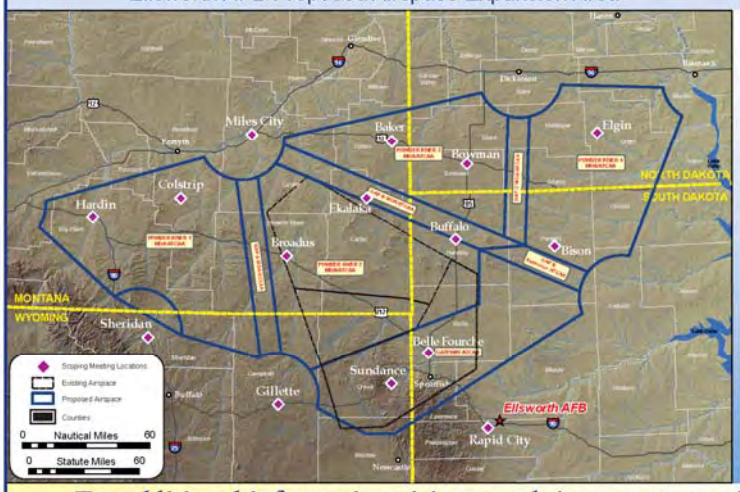

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28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

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EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

DISTRIBUTION LIST

South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501-2217

State Historical Society of North Dakota
612 East Boulevard Avenue
Bismarck, ND 58505-0830

State Parks & Cultural Resources Historic Preservation Office
2301 Central Avenue
Cheyenne, WY 82002

Montana Historical Society
225 N. Roberts
PO Box 20121
Helena, MT 59620

Wyoming State Parks/Historic Sites HQ
2301 Central Avenue
Cheyenne, WY 82002

SAMPLE IICEP LETTER 3

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

The Honorable Jerry Jimison
City of Glendive
300 S Merrill
Glendive, MT 59330

Dear Mayor Jimison:

The United States Air Force (Air Force) is in the process of preparing an Environmental Impact Statement (EIS) to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

The Air Force is committed to community outreach and as an additional effort to inform the public of these meetings, we request your assistance in posting the enclosed flyer in a conspicuous place within your community. The scoping meetings will be in an open-house format, where Air Force representatives will describe the proposed action and alternatives, explain the National Environmental Policy Act, outline opportunities for public involvement, and answer questions about the proposal. The public meetings will be held from 4:00 to 7:00 p.m., and interested parties or citizens are welcome to come at any time since information will be provided throughout the duration of the open house. The Air Force will publish notices of EIS preparation and upcoming public scoping meetings in local newspapers.

Public and agency comments received during the meetings, as well as written comments received by the Air Force during the scoping period and throughout the environmental process, will be considered in the preparation of the EIS. The Air Force will accept comments at any time during the environmental process; however, to ensure the Air Force has sufficient time to consider public input in the preparation of the Draft EIS, comments should be submitted to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Rm 317, Langley AFB VA 23665-2769, by August 4, 2008.

If you any specific questions about this proposal or desire additional information, please contact the public affairs office at Ellsworth AFB SD, 605-385-5056. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachments:
1. Scoping Meeting Brochure
2. Flyer

Global Power For America

The National Environmental Policy Act guides the PRTC EIS.

NEPA requires federal decision makers to consider potential environmental consequences of proposed actions and reasonable alternatives, including a No-Action Alternative in an EIS. The EIS complies with environmental regulations and documents potential impacts to the natural and human environment.

Resources initially identified for analysis in the EIS include (but are not limited to) the following:

- **Airspace Operations**
  Airspace, Noise, Air Quality, and Safety (ground and air)
- **Natural Resources**
  Physical and Biological Resources
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  Cultural, Native American, Traditional, and Historic Resources
- **Human Resources**
  Land Use, Quality of Life, Socioeconomics, and Environmental Justice

The EIS Process Timeline

Opportunities for Public Involvement

1. Notice of Intent (NOI) Published in Federal Register
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Your input is essential to the environmental analysis process!

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Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

To ensure your comments are considered in the Draft EIS, please submit your comments before ***August 4, 2008.***

Public comments on this Draft EIS are requested pursuant to the NEPA, 42 USC 4321, et seq. All written comments received during the comment period will be made available to the public and considered during EIS preparation. Your provision of private address information with your comment is voluntary. Your private address information will not be released in the EIS or for any other purpose, unless required by law. However, your private address information will be used to compile the mailing list for EIS distribution. Failure to provide such information will result in your name not being included on the distribution list.

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

The United States Air Force is conducting scoping meetings for the PRTC EIS. The Air Force is preparing an EIS to determine the potential environmental consequences of a proposal to expand the Powder River Complex to create the PRTC. The PRTC would allow for more effective use of limited resources and finite flying hours by providing, locally, the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth and Minot AFBs. The options being analyzed could:

1. Restructure and reconfigure the existing PRC Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspace (ATCAA) and add new MOA/ATCAA airspace with a floor of 500 feet above ground level (AGL).
2. Increase sortie-operations (aircraft training) in the new and modified training airspace.
3. Support additional ground-based simulated threat emitters under the MOAs.
4. Authorize use of training chaff and flares throughout the new and modified airspace.
5. Permit supersonic flight above 10,000 feet AGL.

Scoping meetings provide the public an opportunity to learn about the proposed PRTC and provide input into this environmental impact analysis process. The scoping process helps us identify and address community-specific issues and concerns regarding the proposed airspace use.

Meeting Agenda

Open House.....4:00 p.m. - 7:00 p.m.

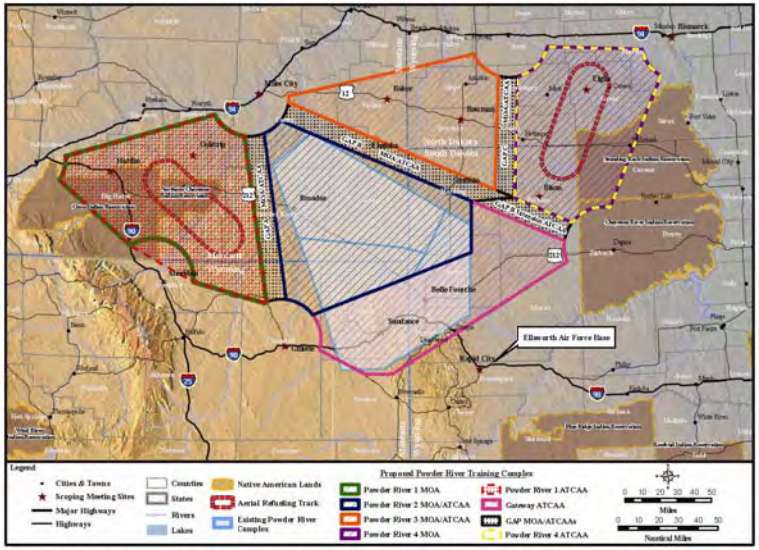
- View video presentation
- Visit information booths
- Discuss proposal with Air Force personnel
- Submit written comments

The Air Force is committed to community outreach and will consider your input to determine the scope of the issues to be addressed and to help identify the significant environmental issues to be analyzed in depth. Your involvement and input are vital to help us focus the environmental analysis.

Why is the PRTC Needed?

- Aircrews need adequately sized, configured, and available airspace to train as they fight during worldwide deployment.
- Increasing training in local airspace optimizes the limited amount of training hours allocated.
- Reducing commute time to remote training ranges like Nevada Test and Training Range (NTTR) reduces fuel consumption.
- Use of chaff and flares allows aircrews to deploy defensive countermeasures as they would in combat.
- Supersonic training assists aircrews to train for show of force and for quick reaction to enemy threats in combat.
- More effectively use limited resources and finite flying hours.

Proposed Alternative A Airspace Changes



The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

Increase Flight Operations: increase number, frequency and variety of sortie-operations.

Employ Large Force Exercises (LFE): use entire proposed PRTC for LFEs of 4 to more than 20 aircraft during scheduled exercises (typically once a quarter).

Support Training Transmitters: support additional ground based simulated emitters under the MOAs.

Permit Supersonic Flight: authorize above 10,000 feet AGL within the proposed PRTC.

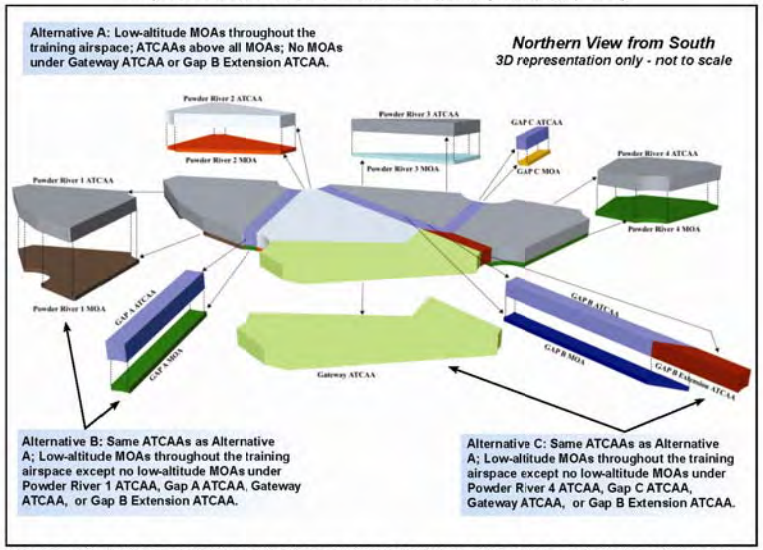
Authorize Defensive Countermeasures: allow training chaff and flare deployment throughout the proposed PRTC.

Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
- Combine and modify existing Crossbow and Powder River 1 ATCAAs to overlie Powder River 2 MOA and rename the ATCAAs - Powder River 2 ATCAA.
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
- Create the Powder River 1, 3, and 4 ATCAAs to connect/correspond with underlying MOAs.
- Establish Gap MOAs and ATCAAs between the Powder River 1, 2, 3, and 4 MOA/ATCAAs.

Proposed Action: Create Powder River Training Complex (PRTC)



All or portions of the following Reservations/counties have the potential of being affected by the training airspace under one or more of the alternatives: ***Montana***: Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***: Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***: Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, and Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

Training aircraft would continue to train in the existing PRC and to overfly parts or all of the following counties: **Montana:** Carter, Custer, Powder River; **South Dakota:** Butte, Custer, Harding, Lawrence, Meade, Pennington; **Wyoming:** Campbell, Crook, Weston.

Training aircraft in high-altitude ATCAAs would continue to overfly approximately 14,100 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would continue to overfly approximately 5,900 square miles.

Powder River

Powder River Training Complex • Environmental Impact Statement

Please Attend!

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Ellsworth Air Force Base (AFB), South Dakota proposes to modify their training airspace.

Please attend a public scoping meeting to:

- ☑ Learn more about the proposal
- ☑ Provide community-specific input
- ☑ Be included on our mailing list

Public Scoping Meetings

Open House 4:00 p.m. to 7:00 p.m.
Public invited to attend at any time. Information will be available throughout.

South Dakota

Rapid City
Monday, June 16, 2008
Rapid City Public Library
610 Quincy Street

Belle Fourche
Tuesday, June 17, 2008
Community Center
(Dakota Room)
1111 National Street

Buffalo
Monday, July 14, 2008
Harding County Memorial
Recreation Center
West Allison Street

Bison
Tuesday, July 15, 2008
Bison School Cafeteria
200 East Carr Street

Wyoming

Sundance
Wednesday, June 18, 2008
Crook County Public Library
414 East Main Street

Gillette
Thursday, June 19, 2008
Campbell County
Fire Department
106 Rohan Avenue

Sheridan
Friday, June 20, 2008
Sheridan Senior Center
North Entrance
211 Smith Street

Montana

Hardin
Monday, June 23
Hardin Chamber of Commerce
10 E. Railroad Street

Colstrip
Tuesday, June 24, 2008
Isabel Bills Community
Learning Center,
520 Poplar Drive

Miles City
Wednesday, June 25, 2008
Miles Community College
2715 Dickinson

Ekalaka
Thursday, June 26, 2008
St. Joan of Arc Parish Hall
Church Street

Broadus
Friday, June 27, 2008
Powder River County District
High School
500 North Trautman

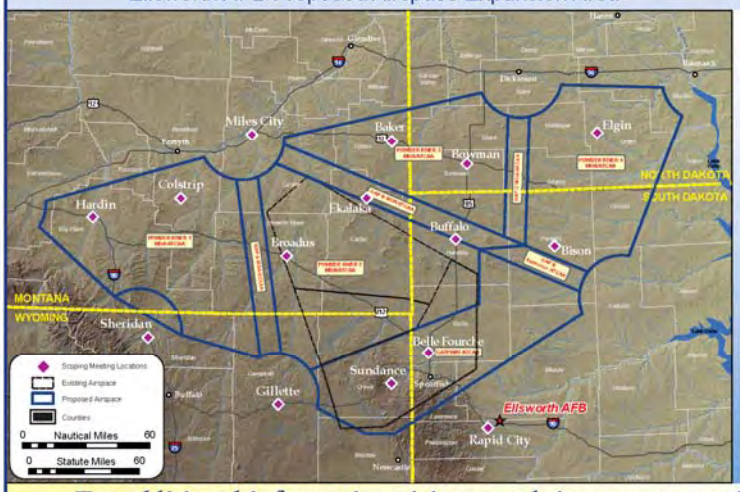
Baker
Tuesday, July 8, 2008
Baker High School
1015 South Third Street West

North Dakota

Bowman
Wednesday, July 9, 2008
City Hall Meeting Room
101 1st Street Southwest

Elgin
Thursday, July 10, 2008
Elgin Community Center
305 North Main Street

Ellsworth AFB Proposed Airspace Expansion Area



For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

Ms. Linda DeVine
EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

DISTRIBUTION LIST

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Colstrip, MT 59323

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City of Wibaux
112 S Wibaux
Wibaux, MT 59353

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Linton, ND 58552

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State Representative
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Union Center, SD 57787

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Buffalo, WY 82834

Jack Landon, Jr.
State Representative
120 Paradise Park Road
Sheridan, WY 82801

Jerry Lekel
State Representative
425 W Heald Street
Sheridan, WY 82801

Rosie Berger
State Representative
PO Box 275
Big Horn, WY 82833

Mark Semlek
State Representative
1307 D Road
Moorcroft, WY 82721

Benita White
New Underwood Town Hall
PO Box 278
New Underwood, SD 57761

Don Sharkey
Upton City Hall
PO Box 203
Upton, WY 82730

Larry Keller
Eagle Butte City Clerk
209 Main Street
Eagle Butte, SD 57625

Scott Turo
Nisland City Hall
306 First Street
Nisland, SD 57762

Glen Haines
City of Faith
204 N Main Street
Faith, SD 57626

Mike Weyrich
Whitewood City Hall
1025 Meade Street
Whitewood, SD 57793

Ann Culp
Clearmont Town Hall
1605 Pennsylvania Avenue
Clearmont, WY 82835

Walter Dauwen
City of Lemmon
303 First Avenue West
Lemmon, SD 57638

Tom Nelson
City of Lead
801 Main Street
Lead, SD 57754

Don Voorhees
City of Hill City
PO Box 395
Hill City, SD 57745

Al Dial
Box Elder City Hall
520 N Ellsworth Road, #9C
Box Elder, SD 57719

Shawn Tabke
Hulett Town Government
123 Hill
Hulett, WY 82720

James McGowin
Joliet City Hall
116 N Main Street
Joliet, MT 59041

Tim DeJaegher
Melstone City Hall
500 Fergus Street
Melstone, MT 59054

Clyde Pfeifle
City of Timber Lake
Main Street
Timber Lake, SD 57656

Bruce Morrison
City of Lovell
336 Nevada Avenue
Lovell, WY 82431

Bob Wood
Dayton Town Hall
608 Broadway
Dayton, WY 82836

Roland Simmons
Cowley Town Hall
20 S Division Street
Cowley, WY 82420

Robert Sieveke
Pine Haven Town Hall
24 Waters Drive
Pine Haven, WY 82721

Cliff Clevenger
Town Hall
145 Coffeen Street
Ranchester, WY 82839

Gary Anderson
City of Buffalo
46 N Main Street
Buffalo, WY 82834

Ed Wagoner
Newcastle City Offices
10 W Warwick
Newcastle, WY 82701

Terry Hartman
Regent City Hall
PO Box 86
Regent, ND 58650

Rex Sadler
City of New England
9 E 7th Street
New England, ND 58647

Francis Toscana
City of Deadwood
102 Sherman St.
Deadwood, SD 57732

Don Howe
City of Dupree
PO Box 276
Dupree, SD 57623

Fred Tschetter
City of Sundance
213 Main Street
Sundance, WY 82729

Harold Stickney
City of Custer
622 Crook Street
Custer, SD 57730-1608

Ron Adams
City of Hardin
406 N Cheyenne
Hardin, MT 59034

Darrell Bends
Lodge Grass City Hall
212 Hester Avenue N
Lodge Grass, MT 59050

Ken Olson
City of Laurel
115 W 1st Street
Laurel, MT 59044

Lyn James
City of Bowman
PO Box 12
Bowman, ND 58623

Darin Maus
City of Golva
16991 49th SW
Golva, ND 58632

Robert Loghry
City of Stanton
304 Main Street
Stanton, ND 58571

John Warford
City of Bismarck
221 N 5th Street
PO Box 5503
Bismarck, ND 58506

Darrell Bjerke
City of Beulah
PO Box 276
Beulah, ND 58523

Dave Kinskey
City of Sheridan
55 Grinnell Plaza
Sheridan, WY 82801

Lyman Amsden
City of Broadus
210 E Holt Street
Broadus, MT 59317

Clayton Hornung
City of Baker
PO Box 1512
Baker, MT 59313

Joe Whalen
City of Miles City
17 S 8th, PO Box 910
Miles City, MT 59301

Daniel Murion
City of Forsyth
Forsyth City Hall
247 N 9th
Forsyth, MT 59327

Rosalee Brimmer
Town of Moorcroft
104 North Bighorn Avenue
PO Box 70
Moorcroft, WY 82721

Duane Evenson
City of Gillette
1411 W Fourth Street
Gillette, WY 82716

SAMPLE IICEP LETTER 4

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Bureau of Indian Affairs
Standing Rock Agency
PO Box E
Fort Yates, ND 58538

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

2. The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1).

3. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

4. The Air Force is committed to community outreach. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host public meetings in

communities underlying and/or adjacent to the proposed airspace as identified in the meeting flyer at attachment 2. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. The 28 Bomb Wing Commander at Ellsworth AFB has initiated consultation with the tribal leaders of the Crow, Northern Cheyenne, Standing Rock and Cheyenne River Nations and community meetings are being coordinated on each Native American Reservation. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

5. To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP at the above address not later than August 4, 2008. If you have any specific questions about this proposal, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

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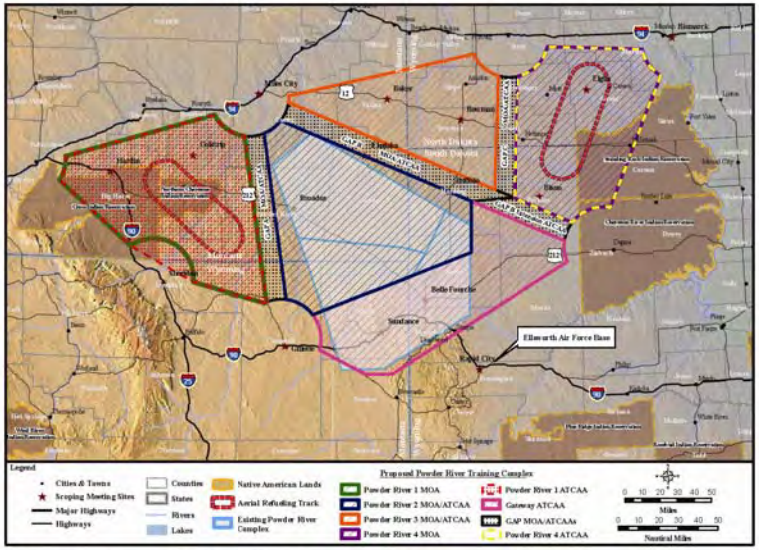

The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

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Employ Large Force Exercises (LFE): use entire proposed PRTC for LFEs of 4 to more than 20 aircraft during scheduled exercises (typically once a quarter).

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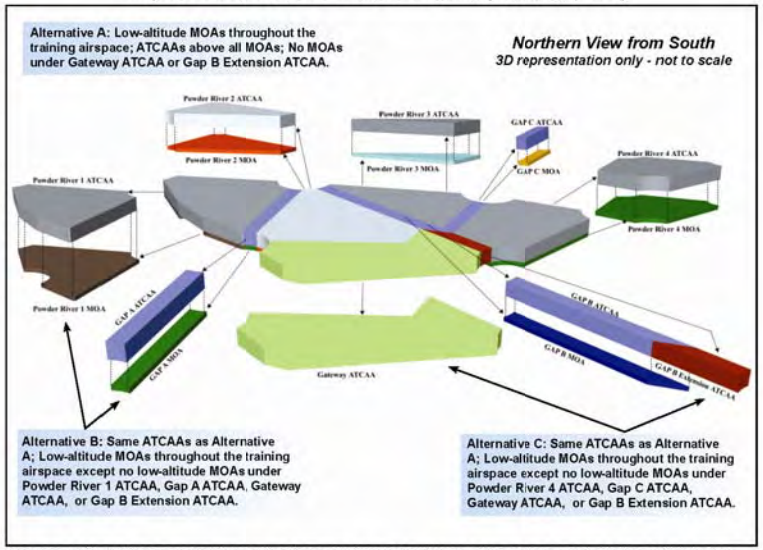
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
- Create the Powder River 1, 3, and 4 ATCAAs to connect/correspond with underlying MOAs.
- Establish Gap MOAs and ATCAAs between the Powder River 1, 2, 3, and 4 MOA/ATCAAs.

Proposed Action: Create Powder River Training Complex (PRTC)



All or portions of the following Reservations/counties have the potential of being affected by the training airspace under one or more of the alternatives: ***Montana***: Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***: Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***: Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, and Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

Training aircraft would continue to train in the existing PRC and to overfly parts or all of the following counties: **Montana:** Carter, Custer, Powder River; **South Dakota:** Butte, Custer, Harding, Lawrence, Meade, Pennington; **Wyoming:** Campbell, Crook, Weston.

Training aircraft in high-altitude ATCAAs would continue to overfly approximately 14,100 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would continue to overfly approximately 5,900 square miles.

Powder River

Powder River Training Complex • Environmental Impact Statement

Please Attend!

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Ellsworth Air Force Base (AFB), South Dakota proposes to modify their training airspace.

Please attend a public scoping meeting to:

- ☑ Learn more about the proposal
- ☑ Provide community-specific input
- ☑ Be included on our mailing list

Community Scoping Meetings

Public invited to attend at any time. Information will be available throughout.

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3 - 5 p.m.
Bear Soldier District Gym

Buffalo
Monday, July 14, 2008
4 - 7 p.m.
Harding County Memorial Recreation Center
West Allison Street

Bison
Tuesday, July 15, 2008
4 - 7 p.m.
Bison School Cafeteria
200 East Carr Street

Dupree
Wednesday, July 16, 2008
4 - 7 p.m.
Multi-Purpose Building
Rodeo Drive, Highway 212
West Side

Wyoming

Gillette
Thursday, June 19, 2008
4 - 7 p.m.
Campbell County Fire Department
106 Rohan Avenue

Sheridan
Friday, June 20, 2008
4 - 7 p.m.
Sheridan Senior Center
North Entrance
211 Smith Street

Montana

Crow Agency
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9:30 - 11:30 a.m.
Apsaalooke Center
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Hardin
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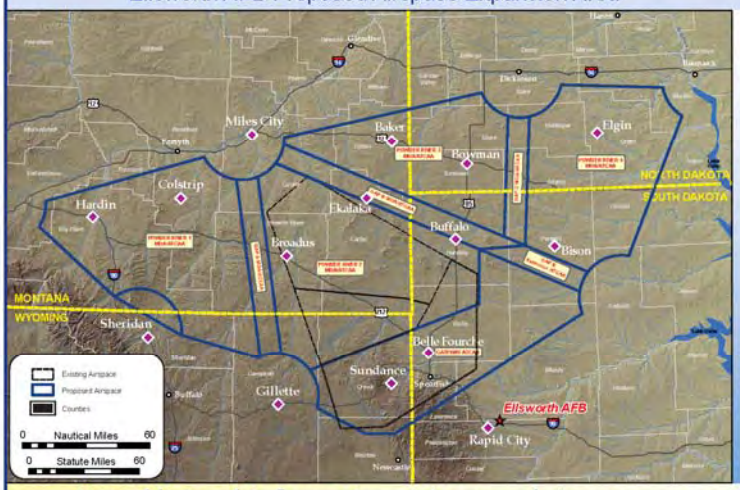
Ellsworth AFB Proposed Airspace Expansion Area



For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

Ms. Linda DeVine
EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

DISTRIBUTION LIST

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Standing Rock Agency
PO Box E
Fort Yates, ND 58538

Ed Parisian
Bureau of Indian Affairs
Rocky Mt Regional Office
316 N. 26th St.
Billings, MT 59101

Daniel Picard
Bureau of Indian Affairs
Pine Ridge Agency
PO Box 1203
Pine Ridge, SD 57770

Terrence Virden
Bureau of Indian Affairs
Midwest Regional Office
One Federal Drive, Rm. 550
Ft. Snelling, MN 55111-4007

Bureau of Indian Affairs
Great Plains Regional Office
115 4th Ave. SE
Aberdeen, SD 57401

Bureau of Indian Affairs
Cheyenne River Agency
PO Box 325
Eagle Butte, SD 57625

SAMPLE IICEP LETTER 5

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Chippewa-Cree Business Committee
Rocky Boy Route, Box 544
Box Elder, MT 59521

Dear Sir/Madam,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1).

As part of this Environmental Impact Analysis Process, the Air Force would like to consider your concerns and initiate Government-to-Government consultation regarding the proposed action. We are in the early stages of gathering information concerning previous archaeological and historic studies for the areas under the affected region. We would appreciate any assistance you could provide in identifying and retrieving this important information, as well as concerns you may have about the potential effects of the proposal on significant cultural resources. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

The Air Force is committed to community outreach. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host public

meetings in communities underlying and/or adjacent to the proposed airspace as identified in the meeting flyer at attachment 2. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP at the above address not later than August 4, 2008. If you have any specific questions about this proposal, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

The National Environmental Policy Act guides the PRTC EIS.

NEPA requires federal decision makers to consider potential environmental consequences of proposed actions and reasonable alternatives, including a No-Action Alternative in an EIS. The EIS complies with environmental regulations and documents potential impacts to the natural and human environment.

Resources initially identified for analysis in the EIS include (but are not limited to) the following:

- **Airspace Operations**
  Airspace, Noise, Air Quality, and Safety (ground and air)
- **Natural Resources**
  Physical and Biological Resources
- **Cultural Resources**
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1. Notice of Intent (NOI) Published in Federal Register
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4. Notice of Availability of Draft EIS
5. **60-Day Public Comment Period**
6. Preparation of Final EIS
7. Notice of Availability of Final EIS
8. 30-Day Waiting Period
9. Record of Decision

Your input is essential to the environmental analysis process!

Providing Comments

To provide comments, please fill out a comment sheet. Please give your comments to an Air Force representative or place it in the comment box. Comment forms, or your own letter, may also be mailed to:

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

To ensure your comments are considered in the Draft EIS, please submit your comments before ***August 4, 2008.***

Public comments on this Draft EIS are requested pursuant to the NEPA, 42 USC 4321, et seq. All written comments received during the comment period will be made available to the public and considered during EIS preparation. Your provision of private address information with your comment is voluntary. Your private address information will not be released in the EIS or for any other purpose, unless required by law. However, your private address information will be used to compile the mailing list for EIS distribution. Failure to provide such information will result in your name not being included on the distribution list.

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

The United States Air Force is conducting scoping meetings for the PRTC EIS. The Air Force is preparing an EIS to determine the potential environmental consequences of a proposal to expand the Powder River Complex to create the PRTC. The PRTC would allow for more effective use of limited resources and finite flying hours by providing, locally, the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth and Minot AFBs. The options being analyzed could:

1. Restructure and reconfigure the existing PRC Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspace (ATCAA) and add new MOA/ATCAA airspace with a floor of 500 feet above ground level (AGL).
2. Increase sortie-operations (aircraft training) in the new and modified training airspace.
3. Support additional ground-based simulated threat emitters under the MOAs.
4. Authorize use of training chaff and flares throughout the new and modified airspace.
5. Permit supersonic flight above 10,000 feet AGL.

Scoping meetings provide the public an opportunity to learn about the proposed PRTC and provide input into this environmental impact analysis process. The scoping process helps us identify and address community-specific issues and concerns regarding the proposed airspace use.

Meeting Agenda

Open House.....4:00 p.m. - 7:00 p.m.

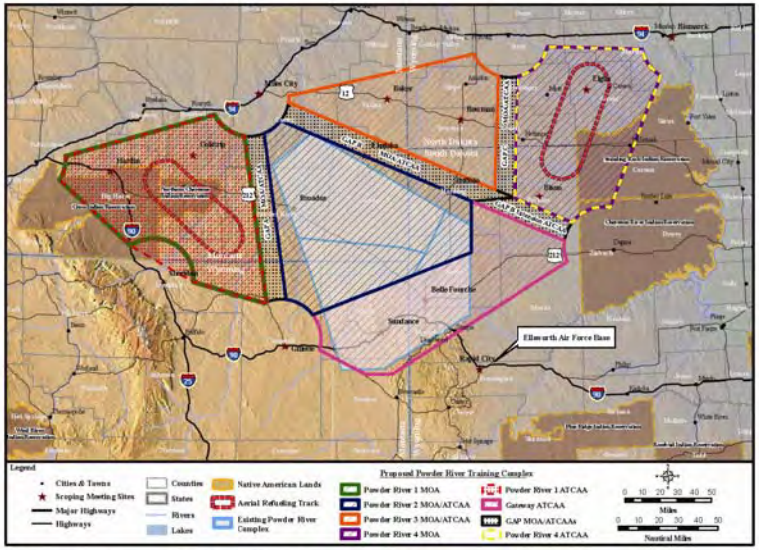
- View video presentation
- Visit information booths
- Discuss proposal with Air Force personnel
- Submit written comments

The Air Force is committed to community outreach and will consider your input to determine the scope of the issues to be addressed and to help identify the significant environmental issues to be analyzed in depth. Your involvement and input are vital to help us focus the environmental analysis.

Why is the PRTC Needed?

- Aircrews need adequately sized, configured, and available airspace to train as they fight during worldwide deployment.
- Increasing training in local airspace optimizes the limited amount of training hours allocated.
- Reducing commute time to remote training ranges like Nevada Test and Training Range (NTTR) reduces fuel consumption.
- Use of chaff and flares allows aircrews to deploy defensive countermeasures as they would in combat.
- Supersonic training assists aircrews to train for show of force and for quick reaction to enemy threats in combat.
- More effectively use limited resources and finite flying hours.

Proposed Alternative A Airspace Changes



The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

Increase Flight Operations: increase number, frequency and variety of sortie-operations.

Employ Large Force Exercises (LFE): use entire proposed PRTC for LFEs of 4 to more than 20 aircraft during scheduled exercises (typically once a quarter).

Support Training Transmitters: support additional ground based simulated emitters under the MOAs.

Permit Supersonic Flight: authorize above 10,000 feet AGL within the proposed PRTC.

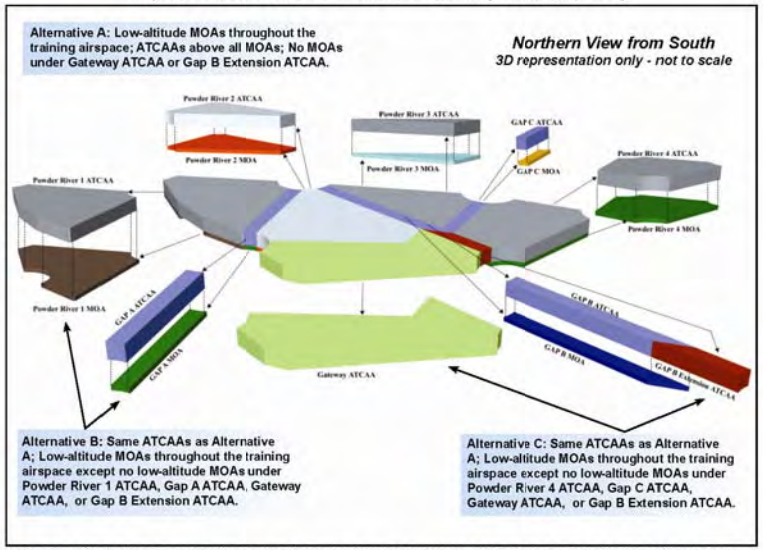
Authorize Defensive Countermeasures: allow training chaff and flare deployment throughout the proposed PRTC.

Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
- Combine and modify existing Crossbow and Powder River 1 ATCAAs to overlie Powder River 2 MOA and rename the ATCAAs - Powder River 2 ATCAA.
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
- Create the Powder River 1, 3, and 4 ATCAAs to connect/correspond with underlying MOAs.
- Establish Gap MOAs and ATCAAs between the Powder River 1, 2, 3, and 4 MOA/ATCAAs.

Proposed Action: Create Powder River Training Complex (PRTC)



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Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

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Powder River

Powder River Training Complex • Environmental Impact Statement

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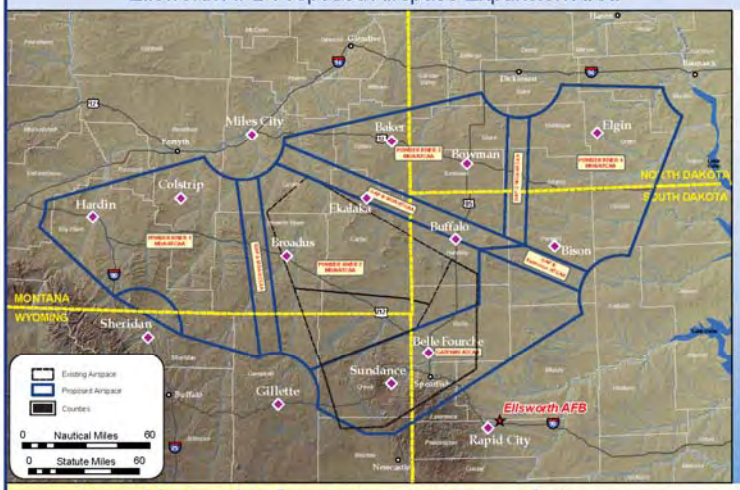

For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

Ms. Linda DeVine
EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

DISTRIBUTION LIST

Chippewa-Cree Business Committee
Rocky Boy Route, Box 544
Box Elder, MT 59521

Turtle Mountain Tribal Council
PO Box 900
Highway 5 West
Belcourt, ND 58316

Three Affiliated Tribes Business Council
404 Frontage Road
New Town, ND 58763

Eastern Shoshone Tribal Council
15 North Fork Road
PO Box 538
Fort Washakie, WY 82514

Rosebud Sioux Tribe
PO Box 430
Rosebud, SD 57570

Arapaho Business Council
PO Box 396
Fort Washakie, WY 82514

Oglala Sioux Tribal Council
PO Box 2070
Pine Ridge, SD 57770

Confederated Salish and Kootenai Tribe
PO Box 278
51383 Highway 93 North
Pablo, MT 59855

Fort Belknap Community Council
RR1, Box 66
Harlem, MT 59526

Fort Peck Tribal Executive Board
PO Box 1027
501 Medicine Bear Road
Poplar, MT 59255

Spirit Lake Sioux Tribal Council
PO Box 359
Fort Totten, ND 58335

SAMPLE IICEP LETTER 6

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 12 2008

Ms. Clara Caufield
Northern Cheyenne Tribal Administration Offices
600 S. Cheyenne Ave.
Lame Deer, MT 59043

Dear Ms. Caufield,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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As part of this Environmental Impact Analysis Process, and in continuance of Government-to-Government consultation initiated by Colonel Scott Vander Hamm, 28 BW/CC, Ellsworth AFB SD, we request your assistance in gathering information concerning previous archaeological and historic studies for the areas under the affected region. We would appreciate any assistance you could provide in identifying and retrieving this important information, as well as concerns you may have about the potential effects of the proposal on significant cultural resources. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

Global Power For America

The Air Force is committed to community outreach and we appreciate the opportunity to hold a community meeting at the Northern Cheyenne Tribal Administration Building Council Chambers on Tuesday, June 24, 2008 from 9:30 – 11:30 a.m. Open communication of issues is a critical element of the EIS process, and we would appreciate your assistance in posting the attached meeting flyers (Atch 2) around the community and encouraging public participation. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Rm 317, Langley AFB VA 23665-2769 not later than August 4, 2008. If you have any specific questions about this request, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

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Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

The United States Air Force is conducting scoping meetings for the PRTC EIS. The Air Force is preparing an EIS to determine the potential environmental consequences of a proposal to expand the Powder River Complex to create the PRTC. The PRTC would allow for more effective use of limited resources and finite flying hours by providing, locally, the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth and Minot AFBs. The options being analyzed could:

1. Restructure and reconfigure the existing PRC Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspace (ATCAA) and add new MOA/ATCAA airspace with a floor of 500 feet above ground level (AGL).
2. Increase sortie-operations (aircraft training) in the new and modified training airspace.
3. Support additional ground-based simulated threat emitters under the MOAs.
4. Authorize use of training chaff and flares throughout the new and modified airspace.
5. Permit supersonic flight above 10,000 feet AGL.

Scoping meetings provide the public an opportunity to learn about the proposed PRTC and provide input into this environmental impact analysis process. The scoping process helps us identify and address community-specific issues and concerns regarding the proposed airspace use.

Meeting Agenda

Open House.....4:00 p.m. - 7:00 p.m.

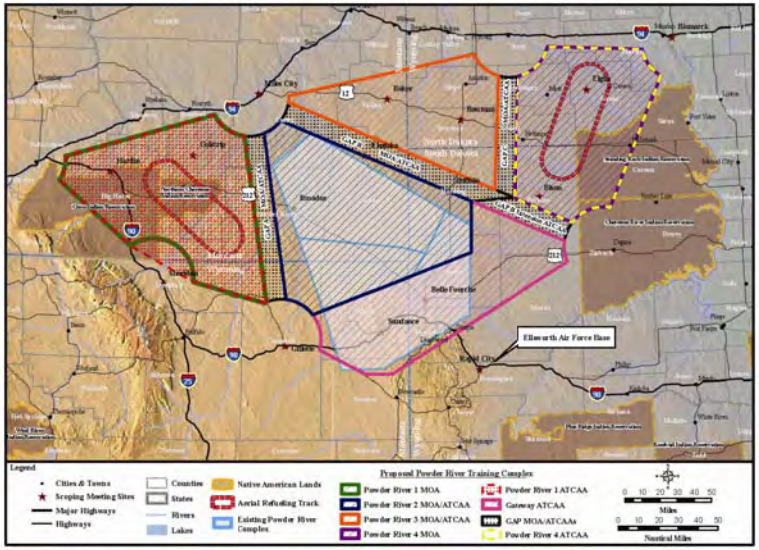
- View video presentation
- Visit information booths
- Discuss proposal with Air Force personnel
- Submit written comments

The Air Force is committed to community outreach and will consider your input to determine the scope of the issues to be addressed and to help identify the significant environmental issues to be analyzed in depth. Your involvement and input are vital to help us focus the environmental analysis.

Why is the PRTC Needed?

- Aircrews need adequately sized, configured, and available airspace to train as they fight during worldwide deployment.
- Increasing training in local airspace optimizes the limited amount of training hours allocated.
- Reducing commute time to remote training ranges like Nevada Test and Training Range (NTTR) reduces fuel consumption.
- Use of chaff and flares allows aircrews to deploy defensive countermeasures as they would in combat.
- Supersonic training assists aircrews to train for show of force and for quick reaction to enemy threats in combat.
- More effectively use limited resources and finite flying hours.

Proposed Alternative A Airspace Changes



The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

Increase Flight Operations: increase number, frequency and variety of sortie-operations.

Employ Large Force Exercises (LFE): use entire proposed PRTC for LFEs of 4 to more than 20 aircraft during scheduled exercises (typically once a quarter).

Support Training Transmitters: support additional ground based simulated emitters under the MOAs.

Permit Supersonic Flight: authorize above 10,000 feet AGL within the proposed PRTC.

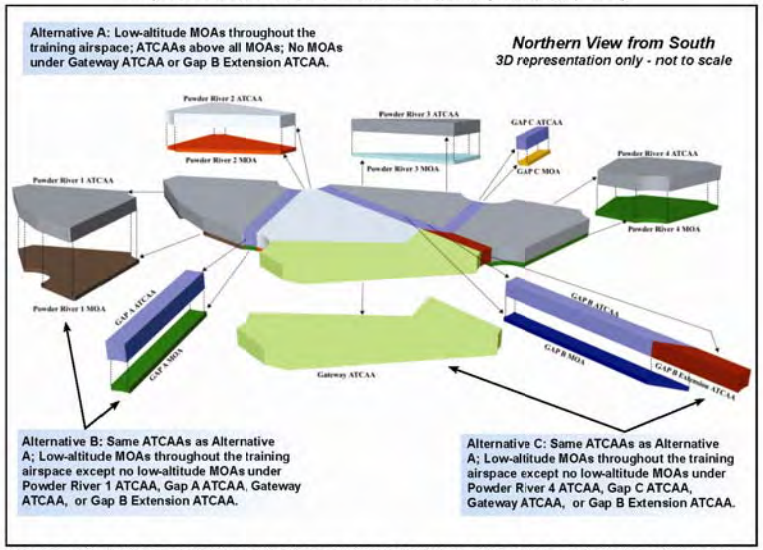
Authorize Defensive Countermeasures: allow training chaff and flare deployment throughout the proposed PRTC.

Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
- Combine and modify existing Crossbow and Powder River 1 ATCAAs to overlie Powder River 2 MOA and rename the ATCAAs - Powder River 2 ATCAA.
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
- Create the Powder River 1, 3, and 4 ATCAAs to connect/correspond with underlying MOAs.
- Establish Gap MOAs and ATCAAs between the Powder River 1, 2, 3, and 4 MOA/ATCAAs.

Proposed Action: Create Powder River Training Complex (PRTC)



All or portions of the following Reservations/counties have the potential of being affected by the training airspace under one or more of the alternatives: ***Montana***: Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***: Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***: Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, and Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

Training aircraft would continue to train in the existing PRC and to overfly parts or all of the following counties: **Montana:** Carter, Custer, Powder River; **South Dakota:** Butte, Custer, Harding, Lawrence, Meade, Pennington; **Wyoming:** Campbell, Crook, Weston.

Training aircraft in high-altitude ATCAAs would continue to overfly approximately 14,100 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would continue to overfly approximately 5,900 square miles.

Powder River

Powder River Training Complex • Environmental Impact Statement

Please Attend!

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Ellsworth Air Force Base (AFB), South Dakota proposes to modify their training airspace.

Please attend a public scoping meeting to:

- ☑ Learn more about the proposal
- ☑ Provide community-specific input
- ☑ Be included on our mailing list

Community Scoping Meetings

Public invited to attend at any time. Information will be available throughout.

South Dakota

McLaughlin
Friday, July 11, 2008
3 - 5 p.m.
Bear Soldier District Gym

Buffalo
Monday, July 14, 2008
4 - 7 p.m.
Harding County Memorial Recreation Center
West Allison Street

Bison
Tuesday, July 15, 2008
4 - 7 p.m.
Bison School Cafeteria
200 East Carr Street

Dupree
Wednesday, July 16, 2008
4 - 7 p.m.
Multi-Purpose Building
Rodeo Drive, Highway 212
West Side

Wyoming

Gillette
Thursday, June 19, 2008
4 - 7 p.m.
Campbell County Fire Department
106 Rohan Avenue

Sheridan
Friday, June 20, 2008
4 - 7 p.m.
Sheridan Senior Center
North Entrance
211 Smith Street

Montana

Crow Agency
Monday, June 23, 2008
9:30 - 11:30 a.m.
Apsaalooke Center
8731 South Heritage Road

Hardin
Monday, June 23
4 - 7 p.m.
Hardin Chamber of Commerce
10 E. Railroad Street

Lame Deer
Tuesday, June 24, 2008
9:30 - 11:30 a.m.
Tribal Administration Building
Council Chambers
600 South Cheyenne Avenue

Colstrip
Tuesday, June 24, 2008
4 - 7 p.m.
Isabel Bills Community Learning Center,
520 Poplar Drive

Miles City
Wednesday, June 25, 2008
4 - 7 p.m.
Miles Community College
2715 Dickinson

Broadus
Friday, June 27, 2008
4 - 7 p.m.
Powder River County District High School
500 North Trautman

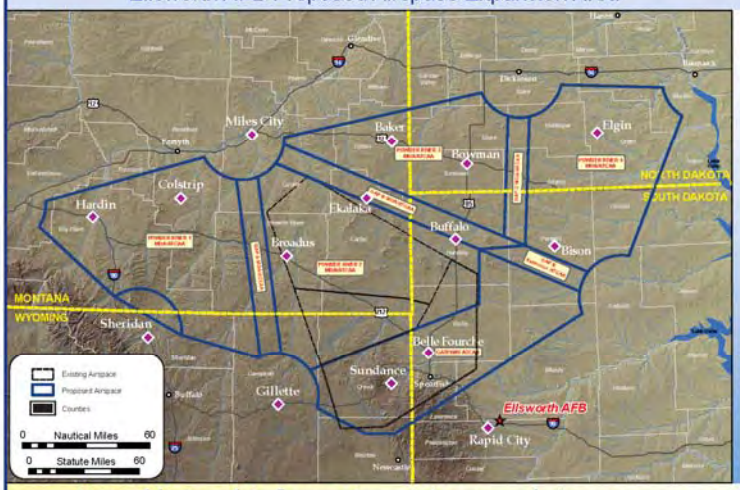
North Dakota

Bowman
Wednesday, July 9, 2008
4 - 7 p.m.
City Hall Meeting Room
101 1st Street Southwest

Elgin
Thursday, July 10, 2008
4 - 7 p.m.
Elgin Community Center
305 North Main Street

Fort Yates
Friday, July 11, 2008
6 - 8 p.m.
AJ Agard Community Center

Ellsworth AFB Proposed Airspace Expansion Area



For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

Ms. Linda DeVine
EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

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Donald Red Thunder
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Eagle Butte, SD 57625

SAMPLE IICEP LETTER 7

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR DISTRIBUTION

FROM: HQ ACC/A7P
129 Andrews Street, Room 317
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

2. The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1). All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

3. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host numerous public meetings in communities underlying and/or adjacent to the proposed action (Atch 2). The scoping meetings will be in held in an open-house format, where Air Force representatives will describe the proposed action and alternatives, the National Environmental Policy Act process which we are undertaking, outline opportunities for public involvement, and answer questions on the proposal. The meetings will last from 4:00 to 7:00 pm

at all locations, and interested parties or citizens are welcome to come at any time since information will be provided throughout the duration of the open house.

4. Meetings with public and agency stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues throughout the environmental impact analysis process. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the National Historic Preservation with public involvement in the EIS prepared under this Environmental Impact Analysis Process. The Federal Aviation Administration has accepted the Air Force's request to be a cooperating agency for this action and has appointed the Central Service Area as their office of primary responsibility for this EIS.

5. The Air Force will accept comments at any time during the environmental process and any information you feel would assist us in this process would be appreciated. To ensure the Air Force has sufficient time to consider public input in the preparation of the draft EIS, information and comments should be submitted to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Room 317, Langley AFB VA 23665-2769 by August 4, 2008.

6. If you have any specific questions about this proposal, please feel free to contact Ms. DeVine at (757) 764-9434, by electronic-mail at acc.prtc@langley.af.mil or contact the public affairs office at Ellsworth AFB SD, 605-385-5056. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachments:
1. Scoping Meeting Brochure
2. Flyer

The National Environmental Policy Act guides the PRTC EIS.

NEPA requires federal decision makers to consider potential environmental consequences of proposed actions and reasonable alternatives, including a No-Action Alternative in an EIS. The EIS complies with environmental regulations and documents potential impacts to the natural and human environment.

Resources initially identified for analysis in the EIS include (but are not limited to) the following:

- **Airspace Operations**
  Airspace, Noise, Air Quality, and Safety (ground and air)
- **Natural Resources**
  Physical and Biological Resources
- **Cultural Resources**
  Cultural, Native American, Traditional, and Historic Resources
- **Human Resources**
  Land Use, Quality of Life, Socioeconomics, and Environmental Justice

The EIS Process Timeline

Opportunities for Public Involvement

1. Notice of Intent (NOI) Published in Federal Register
2. **Scoping**
3. Preparation of Draft EIS
4. Notice of Availability of Draft EIS
5. **60-Day Public Comment Period**
6. Preparation of Final EIS
7. Notice of Availability of Final EIS
8. 30-Day Waiting Period
9. Record of Decision

Your input is essential to the environmental analysis process!

Providing Comments

To provide comments, please fill out a comment sheet. Please give your comments to an Air Force representative or place it in the comment box. Comment forms, or your own letter, may also be mailed to:

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

To ensure your comments are considered in the Draft EIS, please submit your comments before ***August 4, 2008.***

Public comments on this Draft EIS are requested pursuant to the NEPA, 42 USC 4321, et seq. All written comments received during the comment period will be made available to the public and considered during EIS preparation. Your provision of private address information with your comment is voluntary. Your private address information will not be released in the EIS or for any other purpose, unless required by law. However, your private address information will be used to compile the mailing list for EIS distribution. Failure to provide such information will result in your name not being included on the distribution list.

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

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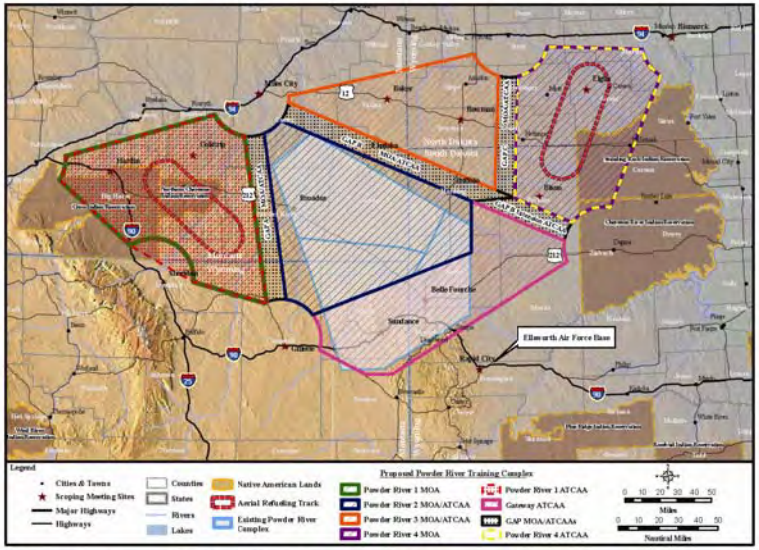

The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

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Support Training Transmitters: support additional ground based simulated emitters under the MOAs.

Permit Supersonic Flight: authorize above 10,000 feet AGL within the proposed PRTC.

Authorize Defensive Countermeasures: allow training chaff and flare deployment throughout the proposed PRTC.

Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
- Combine and modify existing Crossbow and Powder River 1 ATCAAs to overlie Powder River 2 MOA and rename the ATCAAs - Powder River 2 ATCAA.
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
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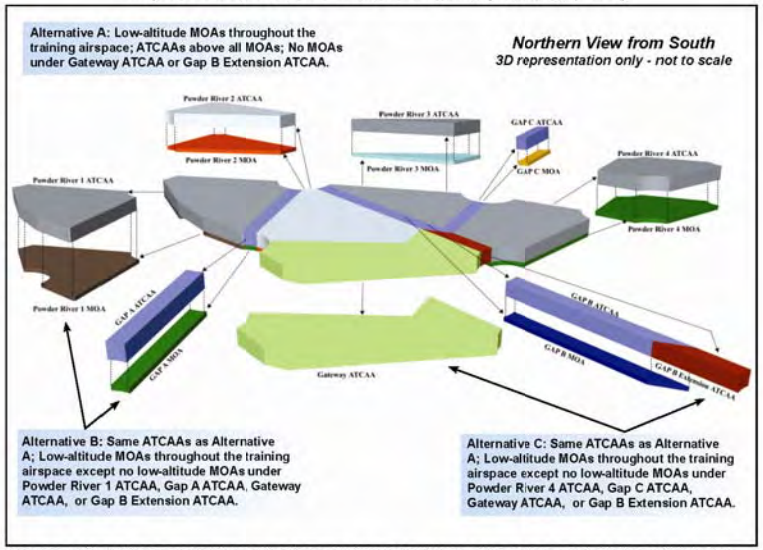
Proposed Action: Create Powder River Training Complex (PRTC)



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Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

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Powder River

Powder River Training Complex • Environmental Impact Statement

Please Attend!

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Ellsworth Air Force Base (AFB), South Dakota proposes to modify their training airspace.

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- ☑ Provide community-specific input
- ☑ Be included on our mailing list

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Open House 4:00 p.m. to 7:00 p.m.
Public invited to attend at any time. Information will be available throughout.

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Rapid City
Monday, June 16, 2008
Rapid City Public Library
610 Quincy Street

Belle Fourche
Tuesday, June 17, 2008
Community Center
(Dakota Room)
1111 National Street

Buffalo
Monday, July 14, 2008
Harding County Memorial
Recreation Center
West Allison Street

Bison
Tuesday, July 15, 2008
Bison School Cafeteria
200 East Carr Street

Wyoming

Sundance
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Crook County Public Library
414 East Main Street

Gillette
Thursday, June 19, 2008
Campbell County
Fire Department
106 Rohan Avenue

Sheridan
Friday, June 20, 2008
Sheridan Senior Center
North Entrance
211 Smith Street

Montana

Hardin
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Hardin Chamber of Commerce
10 E. Railroad Street

Colstrip
Tuesday, June 24, 2008
Isabel Bills Community
Learning Center,
520 Poplar Drive

Miles City
Wednesday, June 25, 2008
Miles Community College
2715 Dickinson

Ekalaka
Thursday, June 26, 2008
St. Joan of Arc Parish Hall
Church Street

Broadus
Friday, June 27, 2008
Powder River County District
High School
500 North Trautman

Baker
Tuesday, July 8, 2008
Baker High School
1015 South Third Street West

North Dakota

Bowman
Wednesday, July 9, 2008
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101 1st Street Southwest

Elgin
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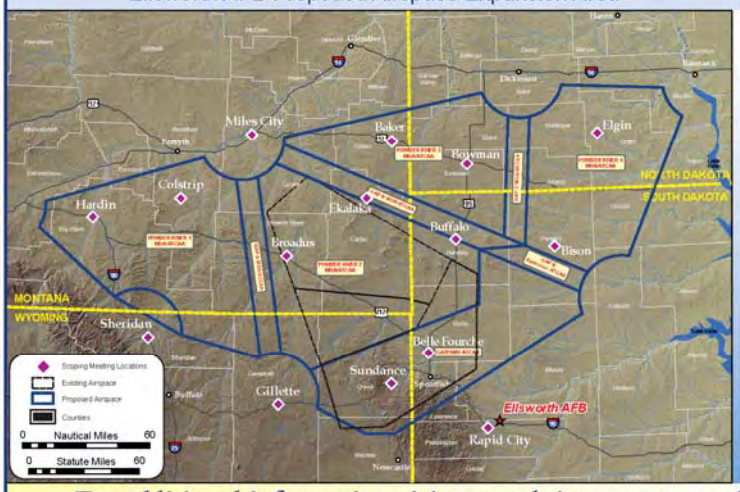
Elgin Community Center
305 North Main Street

Ellsworth AFB Proposed Airspace Expansion Area



For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

Ms. Linda DeVine
EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

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Bismarck, ND 58505-0020

Steven Pirner, P.E.
SD DENR
PMB 2020
Joe Foss Building
523 E Capitol
Pierre, SD 57501

Steven Doohen
South Dakota Department of Military & Veterans Affairs
Soldiers & Sailors Memorial Building
425 East Capitol Avenue
Pierre, SD 57501-5070

Mary Hopkins
State Parks & Cultural Resources
Historic Preservation Office
2301 Central Avenue
Cheyenne, WY 82002

Karl Altenburg
North Dakota Wing Civil Air Patrol
PO Box 608
Bismarck, ND 58502-0608

John Etchepare
Wyoming Department of Agriculture
2219 Carey Avenue
Cheyenne, WY 82002-0100

Joe Moore
Wyoming Office of Homeland Security
122 West 25th Street
Herschler Bldg, 1st Floor East
Cheyenne, WY 82002

Mike Rounds
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Office of the Governor
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Pierre, SD 57501

Larry Kotchman
North Dakota Forest Service
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Bottineu, ND 58318

David Freudenthal
State of Wyoming
State Capitol, 200 West 24th Street
Cheyenne, WY 82002-0010

Jeff Vonk
South Dakota Game, Fish and Parks
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Pierre, SD 57501

Tom Dravland
South Dakota Department of Public Safety
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Pierre, SD 57501

Douglass Prchal
North Dakota Parks and Recreation Department
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Bismarck, ND 58503-0649

Bruce Lindholm
South Dakota DOT
Office of Aeronautics
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Pierre, SD 57501-2586

John Cox
WYDOT Headquarters
5300 Bishop Blvd
Cheyenne, WY 82009-3340

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Department of Environmental Quality
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Wyoming Game and Fish
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Cheyenne, WY 82006

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Rapid City, SD 57702

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Bismarck, ND 58501-5095

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3540 Warlow Drive
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Tanner Shatto
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Sheridan Field Office
1866 S Sheridan Avenue
Sheridan, WY 82801

Jim Boyd
North Dakota Department of Commerce
1600 E Century Avenue, Ste. 2
PO Box 2057
Bismarck, ND 58502-2057

Melissa Bears
Town Clerk
PO Box 278
Hulett, WY 82720

Neiman Sawmill
Attn: Wes Bush
PO Box 218
Hulett, WY 82720

Wes Bush
PO Box 472
Hulett, WY 82720

Devil's Tower National Park
Dorothy Fire Cloud
Hwy 110 Bldg 170
Devils Tower, WY 82714

SAMPLE IICEP LETTER 8

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

The Honorable Jon Tester
United States Senator
Granite Tower
222 N 32nd St, Suite 101
Billings, MT 59101

Dear Senator Tester:

The United States Air Force (USAF) is in the process of preparing an Environmental Impact Statement (EIS) to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming, and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analysis and are discussed in the attached meeting brochure (Atch 1). All or portions of the following locations have the potential to be affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

The Air Force is committed to community outreach. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host public meetings in communities underlying and/or adjacent to the proposed airspace (Atch 2). Community meetings are also being coordinated on each Native American Reservation. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

Global Power For America

The scoping meetings will be in an open-house format, during which Air Force representatives will describe the proposed action and alternatives, explain the National Environmental Policy Act, outline opportunities for public involvement, and answer questions about the proposal. The public meetings will be held from 4:00 to 7:00 p.m., and interested parties are welcome to come at any time information will be provided throughout the duration of the open house. The Air Force will publish notices of EIS preparation and upcoming public scoping meetings in local newspapers.

Public and agency comments received during the meetings, as well as written comments received by the Air Force during the scoping period and throughout the environmental process, will be considered in the preparation of the EIS. The Air Force will accept comments at any time during the environmental process; however, to ensure the Air Force has sufficient time to consider public input in the preparation of the Draft EIS, comments should be submitted to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Rm 317, Langley AFB VA 23665-2769, by August 4, 2008.

If you any specific questions about this proposal, please contact Ms. Linda DeVine at (757) 764-9434 or via e-mail at acc.prtc@langley.af.mil. Thank you in advance for your assistance in this matter.

Sincerely,

ROBERT J. STAIB
Colonel, USAF
Acting Director of Installations and Mission Support (A7)

Attachments:
1. Scoping Meeting Brochure
2. Flyer

Global Power For America

The National Environmental Policy Act guides the PRTC EIS.

NEPA requires federal decision makers to consider potential environmental consequences of proposed actions and reasonable alternatives, including a No-Action Alternative in an EIS. The EIS complies with environmental regulations and documents potential impacts to the natural and human environment.

Resources initially identified for analysis in the EIS include (but are not limited to) the following:

- **Airspace Operations**
  Airspace, Noise, Air Quality, and Safety (ground and air)
- **Natural Resources**
  Physical and Biological Resources
- **Cultural Resources**
  Cultural, Native American, Traditional, and Historic Resources
- **Human Resources**
  Land Use, Quality of Life, Socioeconomics, and Environmental Justice

The EIS Process Timeline

Opportunities for Public Involvement

1. Notice of Intent (NOI) Published in Federal Register
2. **Scoping**
3. Preparation of Draft EIS
4. Notice of Availability of Draft EIS
5. **60-Day Public Comment Period**
6. Preparation of Final EIS
7. Notice of Availability of Final EIS
8. 30-Day Waiting Period
9. Record of Decision

Your input is essential to the environmental analysis process!

Providing Comments

To provide comments, please fill out a comment sheet. Please give your comments to an Air Force representative or place it in the comment box. Comment forms, or your own letter, may also be mailed to:

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

To ensure your comments are considered in the Draft EIS, please submit your comments before ***August 4, 2008.***

Public comments on this Draft EIS are requested pursuant to the NEPA, 42 USC 4321, et seq. All written comments received during the comment period will be made available to the public and considered during EIS preparation. Your provision of private address information with your comment is voluntary. Your private address information will not be released in the EIS or for any other purpose, unless required by law. However, your private address information will be used to compile the mailing list for EIS distribution. Failure to provide such information will result in your name not being included on the distribution list.

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

The United States Air Force is conducting scoping meetings for the PRTC EIS. The Air Force is preparing an EIS to determine the potential environmental consequences of a proposal to expand the Powder River Complex to create the PRTC. The PRTC would allow for more effective use of limited resources and finite flying hours by providing, locally, the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth and Minot AFBs. The options being analyzed could:

1. Restructure and reconfigure the existing PRC Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspace (ATCAA) and add new MOA/ATCAA airspace with a floor of 500 feet above ground level (AGL).
2. Increase sortie-operations (aircraft training) in the new and modified training airspace.
3. Support additional ground-based simulated threat emitters under the MOAs.
4. Authorize use of training chaff and flares throughout the new and modified airspace.
5. Permit supersonic flight above 10,000 feet AGL.

Scoping meetings provide the public an opportunity to learn about the proposed PRTC and provide input into this environmental impact analysis process. The scoping process helps us identify and address community-specific issues and concerns regarding the proposed airspace use.

Meeting Agenda

Open House.....4:00 p.m. - 7:00 p.m.

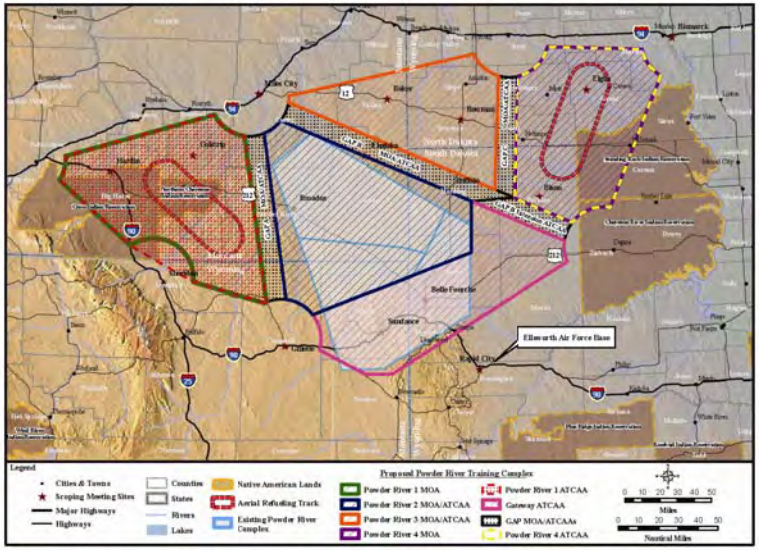
- View video presentation
- Visit information booths
- Discuss proposal with Air Force personnel
- Submit written comments

The Air Force is committed to community outreach and will consider your input to determine the scope of the issues to be addressed and to help identify the significant environmental issues to be analyzed in depth. Your involvement and input are vital to help us focus the environmental analysis.

Why is the PRTC Needed?

- Aircrews need adequately sized, configured, and available airspace to train as they fight during worldwide deployment.
- Increasing training in local airspace optimizes the limited amount of training hours allocated.
- Reducing commute time to remote training ranges like Nevada Test and Training Range (NTTR) reduces fuel consumption.
- Use of chaff and flares allows aircrews to deploy defensive countermeasures as they would in combat.
- Supersonic training assists aircrews to train for show of force and for quick reaction to enemy threats in combat.
- More effectively use limited resources and finite flying hours.

Proposed Alternative A Airspace Changes



The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

Increase Flight Operations: increase number, frequency and variety of sortie-operations.

Employ Large Force Exercises (LFE): use entire proposed PRTC for LFEs of 4 to more than 20 aircraft during scheduled exercises (typically once a quarter).

Support Training Transmitters: support additional ground based simulated emitters under the MOAs.

Permit Supersonic Flight: authorize above 10,000 feet AGL within the proposed PRTC.

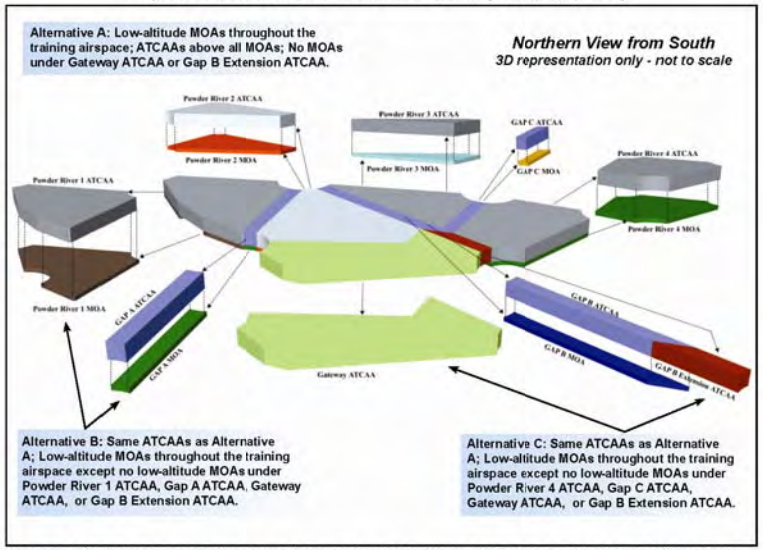
Authorize Defensive Countermeasures: allow training chaff and flare deployment throughout the proposed PRTC.

Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
- Combine and modify existing Crossbow and Powder River 1 ATCAAs to overlie Powder River 2 MOA and rename the ATCAAs - Powder River 2 ATCAA.
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
- Create the Powder River 1, 3, and 4 ATCAAs to connect/correspond with underlying MOAs.
- Establish Gap MOAs and ATCAAs between the Powder River 1, 2, 3, and 4 MOA/ATCAAs.

Proposed Action: Create Powder River Training Complex (PRTC)



All or portions of the following Reservations/counties have the potential of being affected by the training airspace under one or more of the alternatives: ***Montana***: Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***: Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***: Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, and Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

Training aircraft would continue to train in the existing PRC and to overfly parts or all of the following counties: **Montana:** Carter, Custer, Powder River; **South Dakota:** Butte, Custer, Harding, Lawrence, Meade, Pennington; **Wyoming:** Campbell, Crook, Weston.

Training aircraft in high-altitude ATCAAs would continue to overfly approximately 14,100 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would continue to overfly approximately 5,900 square miles.

Powder River

Powder River Training Complex • Environmental Impact Statement

Please Attend!

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Ellsworth Air Force Base (AFB), South Dakota proposes to modify their training airspace.

Please attend a public scoping meeting to:

- ☑ Learn more about the proposal
- ☑ Provide community-specific input
- ☑ Be included on our mailing list

Public Scoping Meetings

Open House 4:00 p.m. to 7:00 p.m.
Public invited to attend at any time. Information will be available throughout.

South Dakota

Rapid City
Monday, June 16, 2008
Rapid City Public Library
610 Quincy Street

Belle Fourche
Tuesday, June 17, 2008
Community Center
(Dakota Room)
1111 National Street

Buffalo
Monday, July 14, 2008
Harding County Memorial
Recreation Center
West Allison Street

Bison
Tuesday, July 15, 2008
Bison School Cafeteria
200 East Carr Street

Wyoming

Sundance
Wednesday, June 18, 2008
Crook County Public Library
414 East Main Street

Gillette
Thursday, June 19, 2008
Campbell County
Fire Department
106 Rohan Avenue

Sheridan
Friday, June 20, 2008
Sheridan Senior Center
North Entrance
211 Smith Street

Montana

Hardin
Monday, June 23
Hardin Chamber of Commerce
10 E. Railroad Street

Colstrip
Tuesday, June 24, 2008
Isabel Bills Community
Learning Center,
520 Poplar Drive

Miles City
Wednesday, June 25, 2008
Miles Community College
2715 Dickinson

Ekalaka
Thursday, June 26, 2008
St. Joan of Arc Parish Hall
Church Street

Broadus
Friday, June 27, 2008
Powder River County District
High School
500 North Trautman

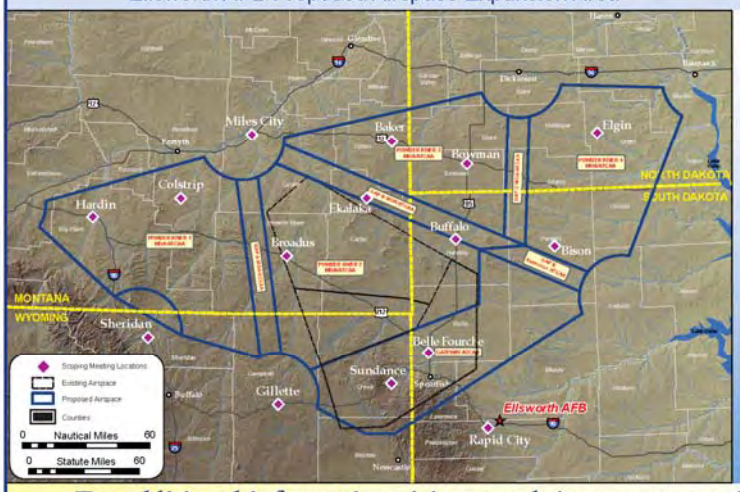
Baker
Tuesday, July 8, 2008
Baker High School
1015 South Third Street West

North Dakota

Bowman
Wednesday, July 9, 2008
City Hall Meeting Room
101 1st Street Southwest

Elgin
Thursday, July 10, 2008
Elgin Community Center
305 North Main Street

Ellsworth AFB Proposed Airspace Expansion Area



For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

Ms. Linda DeVine
EIS Project Manager
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

For additional information visit our website at www.accplanning.org

DISTRIBUTION LIST

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United States Senate
Washington, DC 20510-3403

Earl Pomeroy
House of Representatives
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Washington, DC 20515

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Washington, DC 20510

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Roundup, MT 59072

Keith Bales
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Otter, MT 59062

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Herbert Urlacher
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Taylor, ND 58656-9643

Kenneth McNenny
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Sturgis, SD 57785

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Bruce Burns
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Sheridan, WY 82801

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Jerry Krambeck
City of Spearfish
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Spearfish, SD 57783

Maury LaRue
City of Sturgis
1951 Junction
Sturgis, SD 57785

Alan Hanks
City of Rapid City
300 Sixth Street
Rapid City, SD 57701

Dave Schneider
City of Belle Fourche
606 Sixth Avenue
Belle Fourche, SD 57717

Elmer Miller
City of Washburn
PO Box 309
Washburn, ND 58577

Norman Schock
City of Elgin
309 3rd Ave NW
Elgin, ND 58533

Allen Roll
City of Dunn Center
3 W Main Street
Dunn Center, ND 58626

Lonny Adler
City of Hazen
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Hazen, ND 58545

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PO Box 436
Medora, ND 58645

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Ismay, MT 59336

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City of Sentinel Butte
PO Box 187
Sentinel Butte, ND 58654

Kyle Tschosik
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121 Dakota Avenue
Wilton, ND 58579

Terry Barden
City of Zap
PO Box 97
Zap, ND 58580

Ken LaMont
City of Mandan
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Mandan, ND 58554

Leo Schneider
City of Belfield
107 2nd Avenue NE
Belfield, ND 58622

Del Svalen
City of Braddock
PO Box 33
Braddock, ND 58524

Richard Zarr
City of Center
PO Box 76
Center, ND 58530

Joe Carey
Town of Ekalaka
PO Box 338
Ekalaka, MT 59324

Walt Losinski
City of Beach
Beach, ND

LeRoy Thomas
City of Hebron
PO Box V
Hebron, ND 58638

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SAMPLE IICEP LETTER 9

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR DISTRIBUTION

FROM: HQ ACC/A7P
129 Andrews Street, Room 317
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

2. The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1). All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

3. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host numerous public meetings in communities underlying and/or adjacent to the proposed action (Atch 2). Meetings with public and agency stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues throughout the environmental impact analysis process. The Federal Aviation Administration has accepted the Air Force's request to be a cooperating agency for this action

and has appointed the Central Service Area as their office of primary responsibility for this environmental impact analysis process.

4. The Air Force is committed to community outreach and as an additional effort to inform the public of these meetings, we request your assistance in posting the enclosed Scoping Meeting flyer in a conspicuous place within your community. The scoping meetings will be in held in an open-house format, where Air Force representatives will describe the proposed action and alternatives, the National Environmental Policy Act process which we are undertaking, outline opportunities for public involvement, and answer questions on the proposal. The meetings will last from 4:00 to 7:00 pm at all locations, and interested parties or citizens are welcome to come at any time since information will be provided throughout the duration of the open house.

5. The Air Force will accept comments at any time during the environmental process. However, to ensure the Air Force has sufficient time to consider public input in the preparation of the draft EIS, comments should be submitted to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Room 317, Langley AFB VA 23665-2769 by August 4, 2008.

6. Please direct specific questions about this proposal to the public affairs office at Ellsworth AFB SD, 605-385-5056. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachments:
1. Scoping Meeting Brochure
2. Flyer

The National Environmental Policy Act guides the PRTC EIS.

NEPA requires federal decision makers to consider potential environmental consequences of proposed actions and reasonable alternatives, including a No-Action Alternative in an EIS. The EIS complies with environmental regulations and documents potential impacts to the natural and human environment.

Resources initially identified for analysis in the EIS include (but are not limited to) the following:

- **Airspace Operations**
  Airspace, Noise, Air Quality, and Safety (ground and air)
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  Physical and Biological Resources
- **Cultural Resources**
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9. Record of Decision

Your input is essential to the environmental analysis process!

Providing Comments

To provide comments, please fill out a comment sheet. Please give your comments to an Air Force representative or place it in the comment box. Comment forms, or your own letter, may also be mailed to:

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

To ensure your comments are considered in the Draft EIS, please submit your comments before ***August 4, 2008.***

Public comments on this Draft EIS are requested pursuant to the NEPA, 42 USC 4321, et seq. All written comments received during the comment period will be made available to the public and considered during EIS preparation. Your provision of private address information with your comment is voluntary. Your private address information will not be released in the EIS or for any other purpose, unless required by law. However, your private address information will be used to compile the mailing list for EIS distribution. Failure to provide such information will result in your name not being included on the distribution list.

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Welcome!

The United States Air Force is conducting scoping meetings for the PRTC EIS. The Air Force is preparing an EIS to determine the potential environmental consequences of a proposal to expand the Powder River Complex to create the PRTC. The PRTC would allow for more effective use of limited resources and finite flying hours by providing, locally, the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth and Minot AFBs. The options being analyzed could:

1. Restructure and reconfigure the existing PRC Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspace (ATCAA) and add new MOA/ATCAA airspace with a floor of 500 feet above ground level (AGL).
2. Increase sortie-operations (aircraft training) in the new and modified training airspace.
3. Support additional ground-based simulated threat emitters under the MOAs.
4. Authorize use of training chaff and flares throughout the new and modified airspace.
5. Permit supersonic flight above 10,000 feet AGL.

Scoping meetings provide the public an opportunity to learn about the proposed PRTC and provide input into this environmental impact analysis process. The scoping process helps us identify and address community-specific issues and concerns regarding the proposed airspace use.

Meeting Agenda

Open House.....4:00 p.m. - 7:00 p.m.

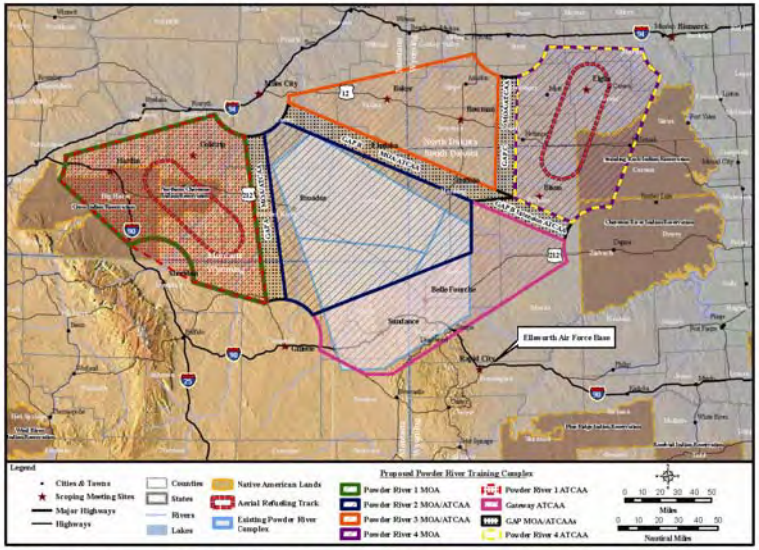
- View video presentation
- Visit information booths
- Discuss proposal with Air Force personnel
- Submit written comments

The Air Force is committed to community outreach and will consider your input to determine the scope of the issues to be addressed and to help identify the significant environmental issues to be analyzed in depth. Your involvement and input are vital to help us focus the environmental analysis.

Why is the PRTC Needed?

- Aircrews need adequately sized, configured, and available airspace to train as they fight during worldwide deployment.
- Increasing training in local airspace optimizes the limited amount of training hours allocated.
- Reducing commute time to remote training ranges like Nevada Test and Training Range (NTTR) reduces fuel consumption.
- Use of chaff and flares allows aircrews to deploy defensive countermeasures as they would in combat.
- Supersonic training assists aircrews to train for show of force and for quick reaction to enemy threats in combat.
- More effectively use limited resources and finite flying hours.

Proposed Alternative A Airspace Changes



The proposed action would make the following modifications to the existing PRC.

Create PRTC Airspace: create new low altitude (500 feet AGL - 17,999 feet MSL) MOA airspace and new high altitude (18,000 - 60,000 feet MSL) ATCAA airspace and restructure and reconfigure the existing PRC MOAs and ATCAAs.

Increase Flight Operations: increase number, frequency and variety of sortie-operations.

Employ Large Force Exercises (LFE): use entire proposed PRTC for LFEs of 4 to more than 20 aircraft during scheduled exercises (typically once a quarter).

Support Training Transmitters: support additional ground based simulated emitters under the MOAs.

Permit Supersonic Flight: authorize above 10,000 feet AGL within the proposed PRTC.

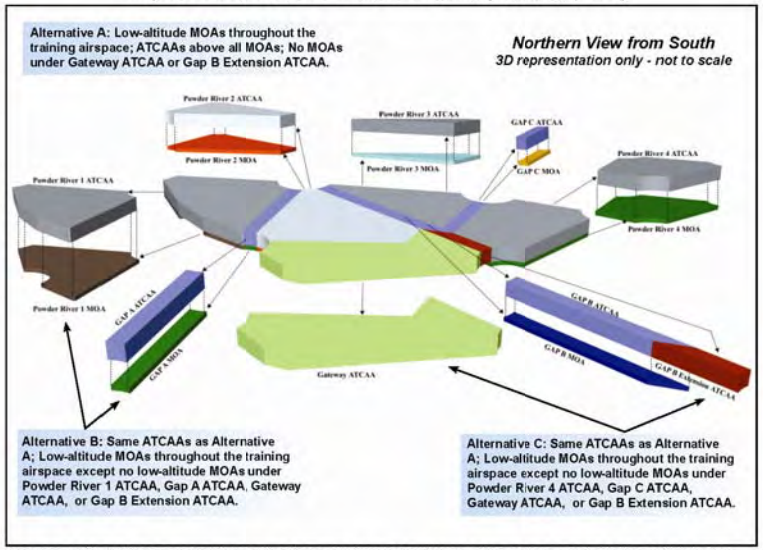
Authorize Defensive Countermeasures: allow training chaff and flare deployment throughout the proposed PRTC.

Alternative A

Under Alternative A, training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 31,700 square miles.

- Expand existing Powder River A/B MOAs and rename expanded airspace - Powder River 2 MOA (500 feet AGL to 17,999 feet MSL).
- Establish Powder River 1, 3, and 4 MOAs (500 feet AGL to 17,999 feet MSL).
- Combine and modify existing Crossbow and Powder River 1 ATCAAs to overlie Powder River 2 MOA and rename the ATCAAs - Powder River 2 ATCAA.
- Modify the Gateway ATCAA to lie adjacent to Powder River 2 ATCAA.
- Create the Powder River 1, 3, and 4 ATCAAs to connect/correspond with underlying MOAs.
- Establish Gap MOAs and ATCAAs between the Powder River 1, 2, 3, and 4 MOA/ATCAAs.

Proposed Action: Create Powder River Training Complex (PRTC)



All or portions of the following Reservations/counties have the potential of being affected by the training airspace under one or more of the alternatives: ***Montana***: Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***: Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***: Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, and Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

Alternative A Continued

- Configuration of the MOAs matches their corresponding and overlying ATCAAs, except Powder River 1 MOA.
- Locate two aerial refueling tracks (one each in Powder River 1 and 4 ATCAA).

Alternative B

Same as Alternative A except no low-altitude MOAs under proposed Powder River 1 or proposed Gap A ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 22,800 square miles.

Alternative C

Same as Alternative A except no low-altitude MOAs under proposed Powder River 4 or proposed Gap C ATCAA. Training aircraft in high-altitude ATCAAs would overfly approximately 37,800 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would overfly approximately 24,500 square miles.

No-Action Alternative

Training aircraft would continue to train in the existing PRC and to overfly parts or all of the following counties: **Montana:** Carter, Custer, Powder River; **South Dakota:** Butte, Custer, Harding, Lawrence, Meade, Pennington; **Wyoming:** Campbell, Crook, Weston.

Training aircraft in high-altitude ATCAAs would continue to overfly approximately 14,100 square miles and training aircraft in low-altitude MOAs, under the ATCAAs, would continue to overfly approximately 5,900 square miles.

Powder River

Powder River Training Complex • Environmental Impact Statement

Please Attend!

Scoping Meetings for the Powder River Training Complex (PRTC) Environmental Impact Statement (EIS)

Ellsworth Air Force Base (AFB), South Dakota proposes to modify their training airspace.

Please attend a public scoping meeting to:

- ☑ Learn more about the proposal
- ☑ Provide community-specific input
- ☑ Be included on our mailing list

Public Scoping Meetings

Open House 4:00 p.m. to 7:00 p.m.
Public invited to attend at any time. Information will be available throughout.

South Dakota

Rapid City
Monday, June 16, 2008
Rapid City Public Library
610 Quincy Street

Belle Fourche
Tuesday, June 17, 2008
Community Center
(Dakota Room)
1111 National Street

Buffalo
Monday, July 14, 2008
Harding County Memorial
Recreation Center
West Allison Street

Bison
Tuesday, July 15, 2008
Bison School Cafeteria
200 East Carr Street

Wyoming

Sundance
Wednesday, June 18, 2008
Crook County Public Library
414 East Main Street

Gillette
Thursday, June 19, 2008
Campbell County
Fire Department
106 Rohan Avenue

Sheridan
Friday, June 20, 2008
Sheridan Senior Center
North Entrance
211 Smith Street

Montana

Hardin
Monday, June 23
Hardin Chamber of Commerce
10 E. Railroad Street

Colstrip
Tuesday, June 24, 2008
Isabel Bills Community
Learning Center,
520 Poplar Drive

Miles City
Wednesday, June 25, 2008
Miles Community College
2715 Dickinson

Ekalaka
Thursday, June 26, 2008
St. Joan of Arc Parish Hall
Church Street

Broadus
Friday, June 27, 2008
Powder River County District
High School
500 North Trautman

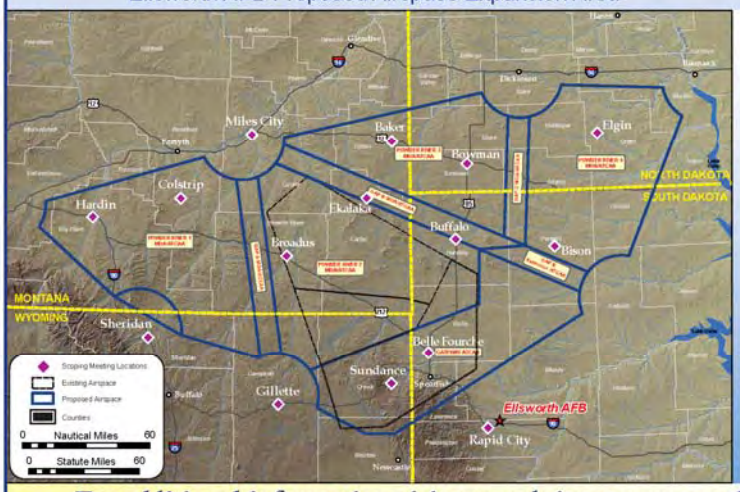
Baker
Tuesday, July 8, 2008
Baker High School
1015 South Third Street West

North Dakota

Bowman
Wednesday, July 9, 2008
City Hall Meeting Room
101 1st Street Southwest

Elgin
Thursday, July 10, 2008
Elgin Community Center
305 North Main Street

Ellsworth AFB Proposed Airspace Expansion Area



For more information about the meeting contact:

28th Bomb Wing
Ellsworth AFB, Public Affairs
(605) 385-5056

Send comments to:

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For additional information visit our website at www.accplanning.org

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SEP 28 2007

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Washington DC 20591

Dear Ms. Kalinowski

In accordance with the President's Council on Environmental Quality National Environmental Policy Act Regulations 40 CFR § 1501.6, *Cooperating Agencies*, the Air Force requests the participation of the Federal Aviation Administration (FAA) as a cooperating agency in the preparation of two unrelated Air Force Environmental Impact Statements (EIS) for:

a. Extension and modifications to the White Elk Military Operating Area in Nevada. This airspace initiative would support Ready Aircrew Program training of the 388 Fighter Wing, Hill AFB, Utah, during times when the Utah Test and Training Range is being used for higher priority testing.

b. Modification of the Powder River Training Complex in Montana, Wyoming, North Dakota and South Dakota. This airspace initiative would support the 28th Bomb Wing, Ellsworth AFB, South Dakota, among others, by providing realistic combat training that maximizes valuable aircrew flying hours while saving millions of dollars annually.

As a cooperating agency, the Air Force requests the FAA participate in various portions of the EIS development as may be required. Specifically, the Air Force asks the FAA to support as a cooperating agency by:

- Participating in the scoping process
- Assuming responsibility, upon request by the Air Force, for developing information and preparing analyses on issues for which the FAA has special expertise; and
- Making staff support available to enhance interdisciplinary review capability.

Please respond in writing to this request. Should you or your staff have any questions regarding this memo, our Headquarters Air Combat Command points of contact are Ms Sheryl K. Parker, A7PP, (757) 764-9334 for the White Elk, and Ms Linda DeVine, A7PP, (757)-764-9434 for the Powder River.

Sincerely

KEVIN W. BILLINGS
Deputy Assistant Secretary
(Environment, Safety and Occupational Health)

U.S. Department
of Transportation
**Federal Aviation
Administration**

RECEIVED OCT 15 2007

System Operations Airspace and
Aeronautical Information Management
800 Independence Ave., SW.
Washington, DC 20591

OCT 10 2007

Kevin W. Billings
Deputy Assistant Secretary
(Environment, Safety and Occupational Health)
SAF/IEE
1665 Air Force Pentagon
Washington, DC 20330-1665

Dear Mr. Billings:

Thank you for your letter of September 28, 2007 requesting Federal Aviation Administration participation in the environmental processes associated with two unrelated U. S. Air Force (USAF) proposals. We understand that the USAF is proposing to extend and modify the White Elk Military Operations Area (MOA) in Nevada; and, is also proposing to modify the Powder River Training Complex (PRTC), which includes airspace in the Montana, Wyoming, North Dakota, and South Dakota areas.

We are pleased to participate as a cooperating agency, in accordance with the National Environmental Policy Act of 1969, as Amended, and its' implementing regulations. Since the proposals contemplate activities associated with Special Use Airspace (SUA), the FAA will cooperate following the guidelines described in the Memorandum of Understanding between the FAA and the Department of Defense Concerning SUA Environmental Actions, dated October 4, 2005.

The FAA Western Service Area will be the primary focal point for matters related to the White Elk MOA, while the Central Service Area will be the primary focal point for matters related to the PRTC environmental processes. I have forwarded a copy of this letter and your letter to the Western System Support Group Manager, Mr. Clark Desing who can be contacted directly at (425) 917-6700; and to the Central System Support Group Manager, Mr. Don Smith who can be contacted directly at (817) 222-5530. The FAA looks forward to working with the USAF on the environmental process associated with the two proposals identified above.

Sincerely,

Edith V. Parish,
Acting Director

cc: Central and Western Service Areas, System Support

Consultation and Coordination Letters

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STATE HISTORICAL SOCIETY OF NORTH DAKOTA

John Hoeven
Governor of North Dakota

North Dakota State Historical Board

Albert I. Berger
Grand Forks - President

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Bismarck - Vice President

Gereld Gerntholz
Valley City - Secretary

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Douglass Prchal
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Parks and Recreation Department

Francis Ziegler
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Department of Transportation

Merlan E. Paaverud, Jr.
Director

Accredited by the American Association of Museums

June 18, 2008

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street
Langley AFB VA 23665-2769

ND SHPO 08-0893: Powder River Training Complex, Environmental Impact Statement (EIS), North Dakota

Dear Ms. DeVine;

We received your preliminary information regarding ND SHPO 08-0893: Powder River Training Complex, Environmental Impact Statement (EIS) in North Dakota and other western states. We seek additional information regarding practices that have the potential to impact cultural resources, including low-altitude training, the nature and distribution of "chaff" and "flares" and the type and distribution of "ground-based assets."

Thank you for the opportunity to review this project. We look forward to further consultation regarding this project. If you have any questions please contact Susan Quinnell, Review and Compliance Coordinator at (701) 328-3576, squinnell@nd.gov or Paul Picha, Chief Archaeologist, (701) 328-3574.

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer (North Dakota)

North Dakota Heritage Center • 612 East Boulevard Avenue, Bismarck, ND 58505-0830 • Phone 701-328-2666 • Fax: 701-328-3710
Email: histsoc@nd.gov • Web site: http://www.nd.gov/hist• TTY: 1-800-366-6888

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South Dakota
Department of Tourism and State Development

July 7, 2008

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

Project: 080604006F – Power River Training Complex, Environmental Impact Statement
Location: Multiple Counties
(DOD/Air Force)

Dear Ms. DeVine:

Thank you for the opportunity to comment on the above referenced project. The South Dakota Office of the State Historic Preservation Officer (SHPO) would like to provide the following list of areas in South Dakota that may be considered Traditional Cultural Properties and/or places of religious and cultural significance to Indian Tribes. The list also includes contact information for each land managing agency associated with the resource.

Bear Butte National Historic Landmark:	Bear Butte State Park PO Box 688; E Hwy 79 Sturgis, SD 57785
National Park Service:	Ernest Quintana, Regional Director National Park Service, MWRO 601 River Front Drive Omaha, NE 68102
Black Hills:	District Ranger Black Hills National Forest Northern Hills Ranger District 2014 N. Main Street Spearfish, SD 57783
Custer National Forest:	Forest Supervisor Custer National Forest 1310 Main Street Billings, MT 59105

Please note the above list is not all inclusive. For additional information concerning the identification of historic properties, we recommend contacting the appropriate consulting parties as outlined in 36 CFR part 800 – Protection of historic properties. For your convenience a list of Indian Tribes and contact information has been included.

Should you require additional information, please contact Paige Hoskinson Olson, Review and Compliance Coordinator, at (605) 773-6004. Your concern for the non-renewable cultural heritage of our state is appreciated.

Sincerely,

Jay D. Vogt
State Historic Preservation Officer

Paige Hoskinson Olson
Review and Compliance Coordinator

Enclosure: South Dakota Tribal Chairman and Tribal Historic Preservation Offices

South Dakota Tribal Chairman and Tribal Historic Preservation Offices

Chairman: Joseph Brings Plenty
Cheyenne River Sioux Tribe
PO Box 590
Eagle Butte, SD 57625-0590
Phone (605) 964-4155
Fax (605) 964-4151

THPO:
Cheyenne River Sioux Tribe
Tribal Historic Preservation Office
PO Box 590
Eagle Butte, SD 57625
Phone (605) 964-7554
Fax (605) 964-7552

Chairman: Brandon Sazue Sr.
Crow Creek Sioux Tribe
PO Box 50
Ft. Thompson, SD 57339-0050
Phone (605) 245-2221
Fax (605) 245-2470

Chairman: Josh Weston
Flandreau-Santee Sioux Tribe
PO Box 283
Flandreau, SD 57028-0283
Phone (605) 997-3512
Fax (605) 997-3878

Chairman: Michael Jandreau
Lower Brule Sioux Tribe
PO Box 187
Lower Brule, SD 57548-0187
Phone (605) 473-5561
Fax (605) 473-5606

Cultural Resources: Scott Jones
Lower Brule Sioux Tribe
PO Box 187
Lower Brule, SD 57548-0187
Phone (605) 473-5561
Fax (605) 473-5606

Chairman: John Yellow Bird Steele
Oglala Sioux Tribe
PO Box 2070
Pine Ridge, SD 57770-2070
Phone (605) 867-5821
Fax (605) 867-1449

Cultural Resources: Joyce Whiting
Oglala Sioux Tribe
US Highway 18
Behind Tribal Building
Pine Ridge, SD 57770
(605) 867-1271

Chairman: Rodney Bordeaux
Rosebud Sioux Tribe
PO Box 430
Rosebud, SD 57570-0430
Phone (605) 747-2381
Fax (605) 747-2243

THPO: Russell Eagle Bear
Rosebud Sioux Tribe
Tribal Historic Preservation Office
PO Box 658
Rosebud, SD 57570-0658
Phone (605) 747-2381
Fax (605) 747-4227
Kathy Arcoren
Phone (605) 747-4255
rstthpo@yahoo.com

Chairman: Mike Selvage
Sisseton-Wahpeton Oyate
PO Box 509
Agency Village, SD 57262-0509
Phone (605) 698-3911
Fax (605) 698-3708

Chairman: Ron His Horse Is Thunder
Standing Rock Sioux Tribe
PO Box D
Ft. Yates, ND 58538-0522
Phone (701) 854-8500
Fax (701) 854-7299

Chairman: Robert Cournoyer
Yankton Sioux Tribe
PO Box 248
Marty, SD 57361-0248
Phone (605) 384-3641
Fax (605) 384-5687

Chairman: Marcus D. Wells, Jr.
Mandan, Hidatsa & Arikara Nation
Three Affiliated Tribes
404 Frontage Road
New Town, ND 58763
Phone: (701) 627-4781
Fax (701) 627-4748

THPO: Dianne Desrosiers
Sisseton-Wahpeton Oyate
PO Box 907
Sisseton, SD 57262
Phone (605) 698-4972
Fax (605) 698-7054

THPO: Tim Mentz, Sr.
Standing Rock Sioux Tribe
Tribal Historic Preservation Office
PO Box D
Fort Yates, ND 58538
Phone (701) 854-2120
Fax (701) 854-2138

THPO:
Mandan, Hidatsa & Arikara Nation
Three Affiliated Tribes
404 Frontage Road
New Town, ND 58763
Phone: (701) 627-4781
Fax (701) 627-4748

THPO: Brady Grant
Turtle Mountain Band of Chippewa
PO Box 900
Belcourt, North Dakota 58316
(701) 477-2604

THPO: Pam Halverson
Lower Sioux Indian Community
PO Box 308
39527 Res Hwy 1
Morton MN 56270
(507)697-6185

THPO: Curley Youpee
Fort Peck
PO Box 836
Poplar MT 59255
(406) 768-5155

THPO: Joanne White
Northern Arapaho Tribe
533 Ethete Rd
Ethete, WY 82520

(74)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408

June 13, 2008

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Suite 122
Langley Air Force Base, Virginia 23665-2769

Re: Powder River Training Complex,
Environmental Impact Statement,
Multiple Counties in South Dakota

Dear Ms. DeVine:

This letter is in response to your request dated June 3, 2008, for environmental comments regarding the above referenced project involving the expansion and enhancement of the existing Powder River Complex near Ellsworth Air Force Base. The area under consideration includes Standing Rock and Cheyenne River Reservations and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, and Ziebach Counties in South Dakota.

Please consult National Wetlands Inventory maps (available online at http://wetlands.fws.gov/) for any wetlands that exist in the area of proposed activity. If a project may impact wetlands or other important fish and wildlife habitats, the U.S. Fish and Wildlife Service (Service), in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347) and other environmental laws and rules, recommends complete avoidance of these areas, if possible; then minimization of any adverse impacts; and finally, replacement of any lost acres; in that order. Alternatives should be examined and the least damaging practical alternative selected. If wetland impacts are unavoidable, a mitigation plan addressing the number and types of wetland acres to be impacted and the methods of replacement should be prepared and submitted to the resource agencies for review.

Work requiring the alteration or disturbance of wetlands or streams may require a permit from the U.S. Army Corps of Engineers (Corps) according to the regulations set forth in section 10 of the Rivers and Harbors Act or section 404 of the Clean Water Act. You may contact the Corps' Regulatory Office at 28563 Powerhouse Road, Room 118, Pierre, South Dakota 57501, Telephone No. (605) 224-8531.

Enclosed is a list of endangered species by county. In accordance with section 7(c) of the Endangered Species Act, as amended, 16 U.S.C. 1531 et seq., we have determined that the following federally listed species may occur in the project area (this list is considered valid for 90 days):

Species	Status	Expected Occurrence
Whooping crane (Grus americana)	Endangered	Migration.
Least tern (Sterna antillarum)	Endangered	Migration, Nesting.
Piping plover (Charadrius melodus)	Threatened	Migration, Nesting.
Black-footed ferret (Mustela nigripes)	Endangered/Proposed (Experimental Populations Only)	Potential Resident in Pennington County
Topeka shiner (Notropis topeka)	Endangered	Known Resident.
Bald eagle (Haliaeetus leucocephalus)	Delisted	Migration, Winter Resident, Possible Nesting.

Whooping cranes migrate through South Dakota on their way to northern breeding grounds and southern wintering areas. They occupy numerous habitats such as cropland and pastures; wet meadows; shallow marshes; shallow portions of rivers, lakes, reservoirs, and stock ponds; and both freshwater and alkaline basins for feeding and loafing. Overnight roosting sites frequently require shallow water in which they stand and rest. Should construction/activities occur during spring or fall migration, the potential for disturbances to whooping cranes exists. Disturbance (flushing the birds) stresses them at critical times of the year. We recommend that you remain vigilant for these birds. There is little that can be done to reduce disturbance besides ceasing construction at sites where the birds have been observed. The birds normally do not stay in any one area for long during migration. Any whooping crane sightings should be reported to this office.

Least terns and piping plovers are known to nest on the Missouri River and the Cheyenne River, and they may occur along the Moreau River. These species use sparsely vegetated interchannel sandbars, islands, and shorelines for nesting, foraging, and brood-rearing. They are sensitive to human disturbances which often limit reproduction. Surveys for nesting piping plovers and least terns should be performed prior to any construction, and no construction should take place within one-quarter (1/4) mile of any known piping plover or least tern nest. The birds typically breed in South Dakota between the dates of May 1 and August 15.

Several populations of black-footed ferrets have been reintroduced into South Dakota. Sustainable black-footed ferret populations are exclusively dependent on black-tailed prairie dog colonies for food and habitat. Any black-tailed prairie dog towns >80 acres in size or any towns that are part of a ≥1,000 acre complex of prairie dog colonies may be considered black-footed ferret habitat, and surveys for black-footed ferrets may be required prior to any construction on colonies meeting the above requirements.

Topeka shiners are known to occupy numerous small streams within eastern South Dakota, and most are concentrated within the Big Sioux, Vermillion, and James River watersheds. If any work/activities will be conducted in streams, please contact our office to determine which best management practices would minimize potential adverse impacts to the Topeka shiner.

Although the bald eagle has been delisted from the Endangered Species List, it is still protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles occur throughout South Dakota, and new nests are appearing each year. The birds are associated with large trees, such as cottonwoods, and large lake or river systems, such as the Missouri River. New nests may have been constructed this spring. The best means of avoiding impacts to these birds is by performing activities outside the nesting season of January to August. No construction should occur within one-quarter (1/4) mile of any known active bald eagle nest, and the Service requests notification if any nests are found within one (1) mile of a proposed construction site. Any nests found should be reported to this office.

If the Federal action agency or their designated representative determines that the project "may adversely affect" listed species in South Dakota, it should request formal consultation from this office. If a "may affect - not likely to adversely affect" determination is made for this project, it should be submitted to this office for concurrence. If a "no effect" determination is made, further consultation may not be necessary. However, a copy of the determination should be sent to this office. For more information regarding Federal action agency responsibilities as related to section 7 of the Endangered Species Act, please refer to the Service's Endangered Species Act Consultation Handbook, available online at http://endangered.fws.gov/consultations/index.html.

If changes are made in the project plans or operating criteria, or if additional information becomes available, the Service should be informed so that the above determinations can be reconsidered.

The Service appreciates the opportunity to provide comments. If you have any questions on these comments, please contact Charlene Bessken of this office at (605) 224-8693, Extension 231.

Sincerely,

Pete Gober
Field Supervisor
South Dakota Field Office

Enclosure

cc: Corps/Regulatory; Pierre, SD
(Attention: Steve Naylor)
SAIC; Carpinteria, CA
(Attention: Dr. Thomas W. Mulroy)

U.S. Fish & Wildlife Service

Mountain-Prairie Region
South Dakota Ecological Services Field Office

ENDANGERED SPECIES BY COUNTY LIST
(updated 18 December 2007)

STATE: SOUTH DAKOTA

The Bald Eagle was removed from the List of Endangered and Threatened Wildlife effective August 8, 2007. The protections provided to the bald eagle under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act will continue to remain in place after the species is delisted. National Bald Eagle Management Guidelines have been developed. This rule change does not affect the bald eagle's status as a threatened or endangered species under State laws or suspend any other legal protections provided by State law.

T - Threatened
E - Endangered
XN - Proposed/Experimental Population
CH - Critical Habitat
PCH - Proposed Critical Habitat

COUNTY	GROUP	SPECIES	CERTAINTY OF OCCURRENCE	STATUS
AURORA	BIRD	CRANE, WHOOPING	KNOWN	E
	FISH	SHINER, TOPEKA	KNOWN	E
BEADLE	BIRD	CRANE, WHOOPING	KNOWN	E
	FISH	SHINER, TOPEKA	KNOWN	E
BENNETT	BIRD	CRANE, WHOOPING	KNOWN	E
	INSECT	BEETLE, AMERICAN BURYING[2]	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
BON HOMME	BIRD	PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	KNOWN	E
BROOKINGS	INSECT	BEETLE, AMERICAN BURYING[2]	POSSIBLE	E
	FISH	SHINER, TOPEKA	KNOWN	E

	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
BROWN	BIRD	CURLEW, ESKIMO	EXTREMELY RARE	E
	FISH	SHINER, TOPEKA	KNOWN	E
BRULE	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	POSSIBLE	T
	FISH	STURGEON, PALLID	KNOWN	E
BUFFALO	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	POSSIBLE	T
	FISH	STURGEON, PALLID	KNOWN	E
BUTTE	BIRD	CRANE, WHOOPING	KNOWN	E
CAMPBELL	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	POSSIBLE	E
CHARLES MIX	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	KNOWN	E
CLARK	BIRD	CRANE, WHOOPING	KNOWN	E
	FISH	SHINER, TOPEKA[3]	KNOWN	E
CLAY	BIRD	PLOVER, PIPING	KNOWN	T (CH)

		TERN, LEAST	KNOWN	E
	FISH	SHINER, TOPEKA	KNOWN	E
		STURGEON, PALLID	POSSIBLE	E
	MOLLUSK	MUSSEL, SCALESHELL[6]	HISTORICAL, MISSOURI RIVER	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
CODINGTON	BIRD	CRANE, WHOOPING	KNOWN	E
	FISH	SHINER, TOPEKA	POSSIBLE	E
CORSON	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	SHINER, TOPEKA	HISTORICAL	E
		STURGEON, PALLID	POSSIBLE	E
CUSTER	MAMMAL	FERRET, BLACK-FOOTED	KNOWN	E
DAVISON	FISH	SHINER, TOPEKA	KNOWN	E
DAY	BIRD	PLOVER, PIPING	KNOWN	T
DEUEL	FISH	SHINER, TOPEKA[3]	KNOWN	E
DEWEY	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E

	FISH	SHINER, TOPEKA	HISTORICAL	E
		STURGEON, PALLID	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	KNOWN	XN
DOUGLAS	BIRD	CRANE, WHOOPING	KNOWN	E
EDMUNDS	BIRD	CRANE, WHOOPING	KNOWN	E
FALL RIVER				
FAULK	BIRD	CRANE, WHOOPING	KNOWN	E
GRANT	FISH	SHINER, TOPEKA[3]	POSSIBLE	E
GREGORY	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	INSECT	BEETLE, AMERICAN BURYING[2]	KNOWN	E
	FISH	STURGEON, PALLID	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	POSSIBLE	XN
HAAKON	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T
		TERN, LEAST	KNOWN	E
	INSECT	BEETLE, AMERICAN BURYING[2]	POSSIBLE	E
HAMLIN	FISH	SHINER, TOPEKA[3]	KNOWN	E
HAND	BIRD	CRANE, WHOOPING	KNOWN	E
HANSON	FISH	SHINER, TOPEKA	KNOWN	E
HARDING				
HUGHES	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)

		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	KNOWN	E
HUTCHINSON	FISH	SHINER, TOPEKA	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
HYDE	BIRD	CRANE, WHOOPING	KNOWN	E
JACKSON	BIRD	CRANE, WHOOPING	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	POSSIBLE	XN
JERAULD	BIRD	CRANE, WHOOPING	KNOWN	E
	FISH	SHINER, TOPEKA[3]	KNOWN	E
JONES	BIRD	CRANE, WHOOPING	KNOWN	E
KINGSBURY	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T
	FISH	SHINER, TOPEKA[3]	KNOWN	E
LAKE	FISH	SHINER, TOPEKA[3]	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
LAWRENCE	BIRD	CRANE, WHOOPING	KNOWN	E
LINCOLN	FISH	SHINER, TOPEKA	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
LYMAN	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	POSSIBLE	T
MARSHALL				
MCCOOK	FISH	SHINER, TOPEKA	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
MCPHERSON	BIRD	CRANE, WHOOPING	KNOWN	E
MEADE	BIRD	CRANE, WHOOPING	KNOWN	E
		TERN, LEAST	KNOWN	E
MELLETTE	BIRD	CRANE, WHOOPING	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	POSSIBLE	XN
MINER	FISH	SHINER, TOPEKA	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE	POSSIBLE	T

		FRINGED[1]		
MINNEHAHA	FISH	SHINER, TOPEKA	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
MOODY	FISH	SHINER, TOPEKA	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
PENNINGTON	BIRD	CRANE, WHOOPING	KNOWN	E
		TERN, LEAST	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	KNOWN	XN
PERKINS	BIRD	CRANE, WHOOPING	KNOWN	E
POTTER	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	KNOWN	E
ROBERTS	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
SANBORN	FISH	SHINER, TOPEKA	KNOWN	E
SHANNON	BIRD	CRANE, WHOOPING	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	KNOWN	XN
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
SPINK	BIRD	CRANE, WHOOPING	KNOWN	E
	FISH	SHINER, TOPEKA[3]	POSSIBLE	E
STANLEY	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	KNOWN	E
SULLY	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	KNOWN	E
TODD	INSECT	BEETLE, AMERICAN BURYING[2]	KNOWN	E
	MAMMAL		KNOWN	XN

		FERRET, BLACK-FOOTED[4]		
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
TRIPP	BIRD	CRANE, WHOOPING	KNOWN	E
	INSECT	BEETLE, AMERICAN BURYING[2]	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	POSSIBLE	XN
TURNER	FISH	SHINER, TOPEKA	KNOWN	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
UNION	BIRD	PLOVER, PIPING	KNOWN	T
		TERN, LEAST	KNOWN	E
	INSECT	BEETLE, AMERICAN BURYING[2]	POSSIBLE	E
	FISH	SHINER, TOPEKA	KNOWN	E
		STURGEON, PALLID	POSSIBLE	E
	MOLLUSK	MUSSEL, SCALESHELL	Historic, Missouri River	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
WALWORTH	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	STURGEON, PALLID	POSSIBLE	E
YANKTON	BIRD	CURLEW, ESKIMO	EXTREMELY RARE	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	FISH	SHINER, TOPEKA[3]	POSSIBLE	E
		STURGEON, PALLID	POSSIBLE	E
	MOLLUSK	MUSSEL, SCALESHELL[6]	Historic, Missouri River	E
		PEARLYMUSSEL, HIGGINS EYE[5,6]	One Dead Specimen Found	E
	PLANT	ORCHID, WESTERN PRAIRIE FRINGED[1]	POSSIBLE	T
ZIEBACH	BIRD	CRANE, WHOOPING	KNOWN	E
		PLOVER, PIPING	KNOWN	T (CH)
		TERN, LEAST	KNOWN	E
	MAMMAL	FERRET, BLACK-FOOTED[4]	POSSIBLE	XN

[1] The counties indicated for the Western Prairie Fringed Orchid are counties with potential habitat. Currently, there are no known populations of this species in South Dakota. Status surveys have been completed for the orchid in South Dakota. However, because of the ecology of this species, there is a possibility that plants may be overlooked.

[2] The American Burying Beetle is presently known to occur in Gregory, Tripp and Todd counties. One specimen was recently trapped in Bennett County. A comprehensive status survey has never been completed for the American burying beetle in South Dakota. Until status surveys have been completed, the beetle could and may occur in any county with suitable habitat. Suitable habitat is considered to be any site with significant humus or topsoil suitable for burying carrion.

[3] Although Topeka Shiners have not been formally documented within Clark, Grant, Jerauld, Kingsbury, Lake, Spink, or Yankton Counties, the shiners may still occur in these areas because the counties contain portions of known Topeka Shiner inhabited rivers and/or tributary streams.

[4] Block clearance is a strategy developed by the Service to determine the likelihood of black-footed ferret occurrence in a geographic area and provide sufficient information to allow the Service to assess an area for the biological potential for contributing to recovery of the ferret. The act of block clearing an area negates the need to conduct future ferret surveys to comply with section 7 of the Endangered Species Act. The exception is for National Park Service lands and US Fish and Wildlife Service lands - ferrets are considered threatened in those areas. Black-footed ferrets have been reintroduced in Badlands National Park, Buffalo Gap National Grasslands and Cheyenne River Sioux Tribe Reservation.

[5] A fresh dead shell of a Higgins Eye Pearlymussel was found below Gavins Point Dam on October 27, 2004.

[6] Shells of these species have been found, but no populations have been located.

Any corrections or additions to this list should be submitted to Pete Gober, U.S. Fish and Wildlife Service, South Dakota Field Office, Ecological Services, 420 South Garfield Avenue, Pierre, SD; Telephone (605)224-8693, ext. 224.

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APPENDIX F
RELEVANT STATUTES, REGULATIONS, AND GUIDELINES

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APPENDIX F RELEVANT STATUTES, REGULATIONS, AND GUIDELINES

GENERAL

National Environmental Policy Act (NEPA) of 1969 (Public Law [PL] 91-190, 42 United States Code [USC] 4347, as amended). Requires federal agencies to take the environmental consequences of proposed actions into consideration in their decision-making process. The intent of NEPA is to protect, restore or enhance the environment through well informed federal decisions. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee federal policy in this process.

40 Code of Federal Regulation (CFR) Parts 1500-1508 Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. Parts 1500 through 1508 of this title provide regulations applicable to and binding on all federal agencies for implementing the procedural provisions of the National Environmental Policy Act of 1969, as amended (Pub. L.91-190, 42 USC 4321 et seq.) (NEPA or the Act) except where compliance would be inconsistent with other statutory requirements.

Air Force Instruction 32-7061, Environmental Impact Analysis Process (EIAP), as promulgated at 32 CFR Part 989. Air Force implementation of the procedural provisions of NEPA and CEQ regulations.

***AFPD 32-70, Environmental Quality*.** Requires that the Air Force comply with applicable federal, state, and local environmental laws and regulations, including NEPA. Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality, as amended by EO 11991, sets policy directing the federal government in providing leadership in protecting and enhancing the environment.

Intergovernmental Coordination Act and EO 12372, Intergovernmental Review of Federal Programs. Requires federal agencies to cooperate with and consider state and local views in implementing a federal proposal. AFI 32-7061 requires proponents to implement a process known as Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), which is used for the purpose of agency coordination and implements scoping requirements.

Ensuring Quality of Information Disseminated to the Public by the Department of Defense. This memorandum, signed February 10, 2003 requires that all components of the Department of Defense adopt standards of data quality for information they disseminate.

AIRSPACE

Federal Aviation Act of 1958. Created the Federal Aviation Administration (FAA) and charges the FAA Administrator with ensuring the safety of aircraft and the efficient utilization of the National Airspace System, within the jurisdiction of the United States.

Federal Aviation Administration Regulation 14 CFR Part 71 (1975). Delineates the designation of federal airways, area low routes, controlled airspace, and navigational reporting points.

Federal Aviation Administration Regulation 14 CFR Part 73 (1975). Defines special use airspace and prescribes the requirements for the use of that airspace.

Federal Aviation Administration Regulation 14 CFR Part 91 (1990). Describes the rules governing the operation of aircraft within the United States.

FAA Order JO 7400.2. Includes policy, criteria, and procedures applicable to modification and establishment of Special Use Airspace, including Military Operations Areas.

FAA Order 7110.65. Prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services in the United States.

RANGE MANAGEMENT

AFI 13-212 Volume 1, 2 and 3 Range Planning and Operations. Ensures that Air Force ranges are planned, operated, and managed in a safe manner; that all required equipment and facilities are available to support range use, and that proper security for range assets is present.

NOISE ENVIRONMENT

Executive Order (EO) 12088 Federal Compliance with Pollution Control Standards (1978). Requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution, including noise pollution, with respect to federal facilities and activities under the control of the agency.

Federal Interagency Committee on Urban Noise (1980). Defines noise levels for various land uses and may result in areas that will not qualify for federal mortgage insurance. Additional sections allow for noise attenuation measures that are often required for HUD approval.

United States Environmental Protection Agency (USEPA) Report 550/9-74-004 Information of Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety (1974). This USEPA report summarizes the findings of numerous studies related to sleep disturbance, speech interference, and other potential noise impacts to human health and welfare and establishes guidelines based on these findings.

SAFETY

AFI 32-2001 The Fire Protection Operations and Fire Prevention Program (1 April 1999). Defines the requirements for Air Force installation fire protection programs, including equipment, response times, and training.

AFI 32-3001 Explosive Ordnance Disposal Program (1 October 1999). Regulates and provides procedures for explosives safety and handling. Defines criteria for quantity distances, clear zones, and facilities associated with ordnance.

AFI 91-202 The US Air Force Mishap Prevention Program (1 August 1998). Establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information.

AFI 91-301, Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH). Program implements AFPD 91-3, Occupational Safety and Health by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of Air Force resources and to protect Air Force people from occupational deaths, injuries, or illnesses by managing risks.

Air Force Manual 91-201, Safety: Explosives Safety Standards. Establishes safety standards, provides planning guidance, and defines safety requirements for explosives operations of any kind (including testing, disassembling, modifying, storing, transporting, and handling explosives or ammunition) at Air Force facilities.

Department of Defense Flight Information Publication. Indicates locations of potential hazards (e.g., bird aggregations, obstructions, and noise sensitive locations) under military airspace and defines horizontal and/or vertical avoidance measures. Updated monthly to present current conditions.

MATERIALS MANAGEMENT

Hazardous Materials Transportation Act (HTMA) of 1975 Title I Section 101. Establishes criteria for shippers and carriers that manage hazardous materials and includes training and qualifications of persons handling hazardous materials.

Resource Conservation and Recovery Act (RCRA) of 1976. Regulates the storage, transportation, treatment, and disposal of hazardous waste that could adversely affect the environment.

Occupational Safety and Health Administration (OSHA) Asbestos Standard (29CFR 1926.58) (1970). Lists federal requirements during construction activities for handling and removal of asbestos from equipment and building structures. The chemical hazard communication program (29CFR 1910.120) requires the identification, information, and training on chemical hazards to be available to employees using hazardous materials and instituted material safety data sheets (MSDS) which provide this information.

Solid Waste Disposal Act (SWDA) and Amendments of 1980. Amends RCRA with additional regulation of energy and materials conservation and the establishment of a National Advisory Council.

Hazardous and Solid Waste Amendments (HSWA) of 1984. Significantly expands the scope and requirements of RCRA and mandated underground storage tank (UST) regulations.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act (SARA) of 1986. Provides liability and compensation for cleanup and emergency response from hazardous substances discharged into the environment and the cleanup of hazardous disposal sites.

AFI 32-7080 Pollution Prevention Program (12 May 1994).

AFI 32-7042 Hazardous Waste Management and Regulation (12 May 1994).

AFI 32-7005 Facility Environmental Protection Committee (25 February 1994).

AFI 32-7086 Hazardous Material Management (1 August 1997).

AFI 32-4002 Facility Hazardous Emergency Planning and Response (1 December 1997).

Military Munitions Rule, Title 40 CFR Part 266, Subpart M, "Military Munitions."

PHYSICAL RESOURCES

Federal Water Pollution Control Act of 1948. Establishes procedures and programs for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters, thus protecting habitat conditions in aquatic and wetland ecosystems.

Clean Water Act of 1977 (33 USC 1251-1387). Requires a National Pollution Discharge Elimination System (NPDES) permit for all discharges into waters of the United States to reduce pollution that could affect any form of life. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers.

EO 19988 Floodplain Management (1977). Requires that governmental agencies, in carrying out their responsibilities, provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains.

BIOLOGICAL RESOURCES

Lacey Act of 1900 (16 USC 3371-13378). Brings the unlawful taking of fish, wildlife, and plants under federal jurisdiction by prohibiting specimens taken illegally from being shipped across state boundaries.

Migratory Bird Treaty Act of 1918 (16 USC 701-715s). Establishes protection for migratory birds and their parts (including eggs, nests, and feathers) from hunting, capture, or sale.

Bald Eagle Protection Act of 1940 (16 USC 668-668c). Protects bald eagles and golden eagles by prohibiting the take, possession, or transportation of these species, dead or alive, and includes protection of their nests and eggs.

Fish and Wildlife Coordination Act of 1958 (16 USC 661-666c as amended). Provides for conservation and management of fish and wildlife by encouraging cooperation between the U.S. Fish and Wildlife Service and other federal, state, public, and private agencies.

Wilderness Act of 1964 (16 USC 1131). Directs the Secretary of the Interior to review every roadless area greater than or equal to 5,000 acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System. The act provides criteria for determining suitability and establishes restrictions on activities that can be undertaken on designated areas.

Endangered Species Act of 1973 (16 USC 1531-1544, as amended). Establishes measures for the conservation of plant and animal species listed, or proposed for listing, as threatened or endangered, including the protection of critical habitat necessary for their continued existence.

EO 11990 Protection of Wetlands (1977). Requires the governmental agencies, in carrying out their responsibilities, to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Factors to be considered include conservation and long-term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, and wildlife.

Fish and Wildlife Conservation Act of 1980 (16 USC 2901-2911 as amended). Promotes state programs, and authorizes funding for grants, aimed at developing and implementing comprehensive state non-game fish and wildlife management plans.

North American Wetlands Conservation Act (16 USC 4401-4412) (1989). Supports the management and preservation of waterfowl by funding the implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, the U.S., and Mexico.

CULTURAL RESOURCES

***National Historic Preservation Act of 1966*, as amended.** Provides the principal authority used to protect historic properties, establishes the National Register of Historic Places (NRHP), and defines, in Section 106, the requirements for federal agencies to consider the effects of an action on properties listed on, or eligible for, the NRHP.

Archaeological Resources Protection Act (ARPA) of 1979 (16 USC section 470aa-47011). Ensures the protection and preservation of archaeological sites on federal or Native American lands and establishes a permitting system to allow legitimate scientific study of such resources.

Protection of Historic and Cultural Properties (36 CFR section 800) (2000). Provides an explicit set of procedures for federal agencies to meet their obligations under the National Historic Preservation Act including inventorying resources and consultation with State Historic Preservation Officers (SHPOs) and federally recognized tribes.

Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001-3013). Requires protection and repatriation of Native American burial items found or, or taken from, federal or tribal lands, and requires repatriation of burial items controlled by federal agencies or museums receiving federal funds.

AFI 32-7065 Cultural Resource Management (2004). Sets guidelines for protecting and managing cultural resources on lands managed by the Air Force.

American Indian Religious Freedom Act of 1978 (42 USC section 1996). States that it is the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

EO 13007 Indian Sacred Sites (1996). Requires that, to the extent practicable, federal agencies accommodate access to, and ceremonial use of, sacred sites by Native American religious practitioners, and to avoid adversely affecting the physical integrity of sacred sites.

EO 13084 Consultation and Coordination with Indian Tribal Governments (1998). Requires that federal agencies have an effective process to permit elected officials and other representatives of Indian tribal governments to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.

***Department of Defense (DoD) American Indian and Alaska Native Policy (21 November 1999*).** This policy emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis and requires an assessment, through consultation, of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the services.

LAND USE

Department of Transportation Act of 1966 (49 USC 303), Section 4(f) (formerly 49 USC 1651 (b)(2) and 49 USC 1653f). Protection of certain public lands and all historic sites was originally mandated in Section 4(f) of the 1966 Department of Transportation Act. Public law 90-495 (amended in 1968) amended Section 4(f) to its most commonly known form. In 1983, PL 97-449 re-codified the Act from 49 USC 1651 to 49 USC 303. Congress has amended this Act three other times without substantive changes. It is referred to as Section 4(f) in the Federal Highway Administration Environmental Procedures (23 CFR 772). It declares a national policy to preserve, where possible, "the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." It protects cultural resources that are on or eligible for the National Register of Historic Places.

Section 6(f) (3)-Land and Water Conservation Funds Act. Section 6(f)(3) of the 1964 Land and Water Conservation Funds (L&WCF) Act requires that all property acquired or developed with L&WCF assistance be maintained perpetually in public recreation use. Title 36, Chapter 1, Part 59 describes post-completion compliance responsibilities. These responsibilities apply to each 6(f) property regardless of the extent of program participation. The State is responsible for compliance and enforcement of these provisions and to ensure consistency with the contractual agreement with the National Park Service.

ENVIRONMENTAL JUSTICE

EO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1995). Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The essential purpose of EO 12898 is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

AF Guidance, Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (November 1997). Provides guidance for implementation of EO 12898 in relevant Air Force environmental impact assessments.

EO 13045 Protection of Children from Environmental Health Risks and Safety Risks (1998). This Executive Order directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

APPENDIX G
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Reserved

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APPENDIX H
NOISE

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APPENDIX H NOISE

Noise is generally described as unwanted sound. Unwanted sound can be based on objective effects (such as hearing loss or damage to structures) or subjective judgments (community annoyance). Noise analysis thus requires a combination of physical measurement of sound, physical and physiological effects, plus psycho- and socio-acoustic effects.

Section 1.0 of this appendix describes how sound is measured and summarizes noise impacts in terms of community acceptability and land use compatibility. Section 2.0 gives detailed descriptions of the effects of noise that lead to the impact guidelines presented in Section 1.0. Section 3.0 provides a description of the specific methods used to predict aircraft noise, including a detailed description of sonic booms.

1.0 NOISE DESCRIPTORS AND IMPACT

Aircraft operating in military airspace generate two types of sound. One is "subsonic" noise, which is continuous sound generated by the aircraft's engines and also by air flowing over the aircraft itself. The other is sonic booms (where authorized for supersonic), which are transient impulsive sounds generated during supersonic flight. These are quantified in different ways.

Section 1.1 describes the characteristics which are used to describe sound. Section 1.2 describes the specific noise metrics used for noise impact analysis. Section 1.3 describes how environmental impact and land use compatibility are judged in terms of these quantities.

1.1 Quantifying Sound

Measurement and perception of sound involve two basic physical characteristics: amplitude and frequency. Amplitude is a measure of the strength of the sound and is directly measured in terms of the pressure of a sound wave. Because sound pressure varies in time, various types of pressure averages are usually used. Frequency, commonly perceived as pitch, is the number of times per second the sound causes air molecules to oscillate. Frequency is measured in units of cycles per second, or hertz (Hz).

Amplitude. The loudest sounds the human ear can comfortably hear have acoustic energy one trillion times the acoustic energy of sounds the ear can barely detect. Because of this vast range, attempts to represent sound amplitude by pressure are generally unwieldy. Sound is, therefore, usually represented on a logarithmic scale with a unit called the decibel (dB). Sound measured on the decibel scale is referred to as a sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Because of the logarithmic nature of the decibel scale, sounds levels do not add and subtract directly and are somewhat cumbersome to handle mathematically. However, some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

60 dB + 60 dB = 63 dB, and

80 dB + 80 dB = 83 dB.

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition." The latter term arises from the fact that the combination of decibel values consists of first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

The difference in dB between two sounds represents the ratio of the amplitudes of those two sounds. Because human senses tend to be proportional (i.e., detect whether one sound is twice as big as another) rather than absolute (i.e., detect whether one sound is a given number of pressure units bigger than another), the decibel scale correlates well with human response.

Under laboratory conditions, differences in sound level of 1 dB can be detected by the human ear. In the community, the smallest change in average noise level that can be detected is about 3 dB. A change in sound level of about 10 dB is usually perceived by the average person as a doubling (or halving) of the sound's loudness, and this relation holds true for loud sounds and for quieter sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound *intensity* but only a 50 percent decrease in perceived *loudness* because of the nonlinear response of the human ear (similar to most human senses).

The one exception to the exclusive use of levels, rather than physical pressure units, to quantify sound is in the case of sonic booms. As described in Section 3.2, sonic booms are coherent waves with specific characteristics. There is a long-standing tradition of describing individual sonic booms by the amplitude of the shock waves, in pounds per square foot (psf). This is particularly relevant when assessing structural effects as opposed to loudness or cumulative community response. In this environmental analysis, sonic booms are quantified by either dB or psf, as appropriate for the particular impact being assessed.

***Frequency*.** The normal human ear can hear frequencies from about 20 Hz to about 20,000 Hz. It is most sensitive to sounds in the 1,000 to 4,000 Hz range. When measuring community response to noise, it is common to adjust the frequency content of the measured sound to correspond to the frequency sensitivity of the human ear. This adjustment is called A-weighting (American National Standards Institute 1988). Sound levels that have been so adjusted are referred to as A-weighted sound levels.

The audible quality of high thrust engines in modern military combat aircraft can be somewhat different than other aircraft, including (at high throttle settings) the characteristic nonlinear crackle of high thrust engines. The spectral characteristics of various noises are accounted for by A-weighting, which approximates the response of the human ear but does not necessarily account for quality. There are other, more detailed, weighting factors that have been applied to sounds. In the 1950s and 1960s, when noise from civilian jet aircraft became an issue, substantial research was performed to determine what characteristics of jet noise were a problem. The metrics Perceived Noise Level and Effective Perceived Noise Level were developed. These accounted for nonlinear behavior of hearing and the importance of low frequencies at high levels, and for many years airport/airbase noise contours were presented in terms of Noise Exposure Forecast, which was based on Perceived Noise Level and Effective

Perceived Noise Level. In the 1970s, however, it was realized that the primary intrusive aspect of aircraft noise was the high noise level, a factor which is well represented by A-weighted levels and day-night average sound level (DNL). The refinement of Perceived Noise Level, Effective Perceived Noise Level, and Noise Exposure Forecast was not significant in protecting the public from noise.

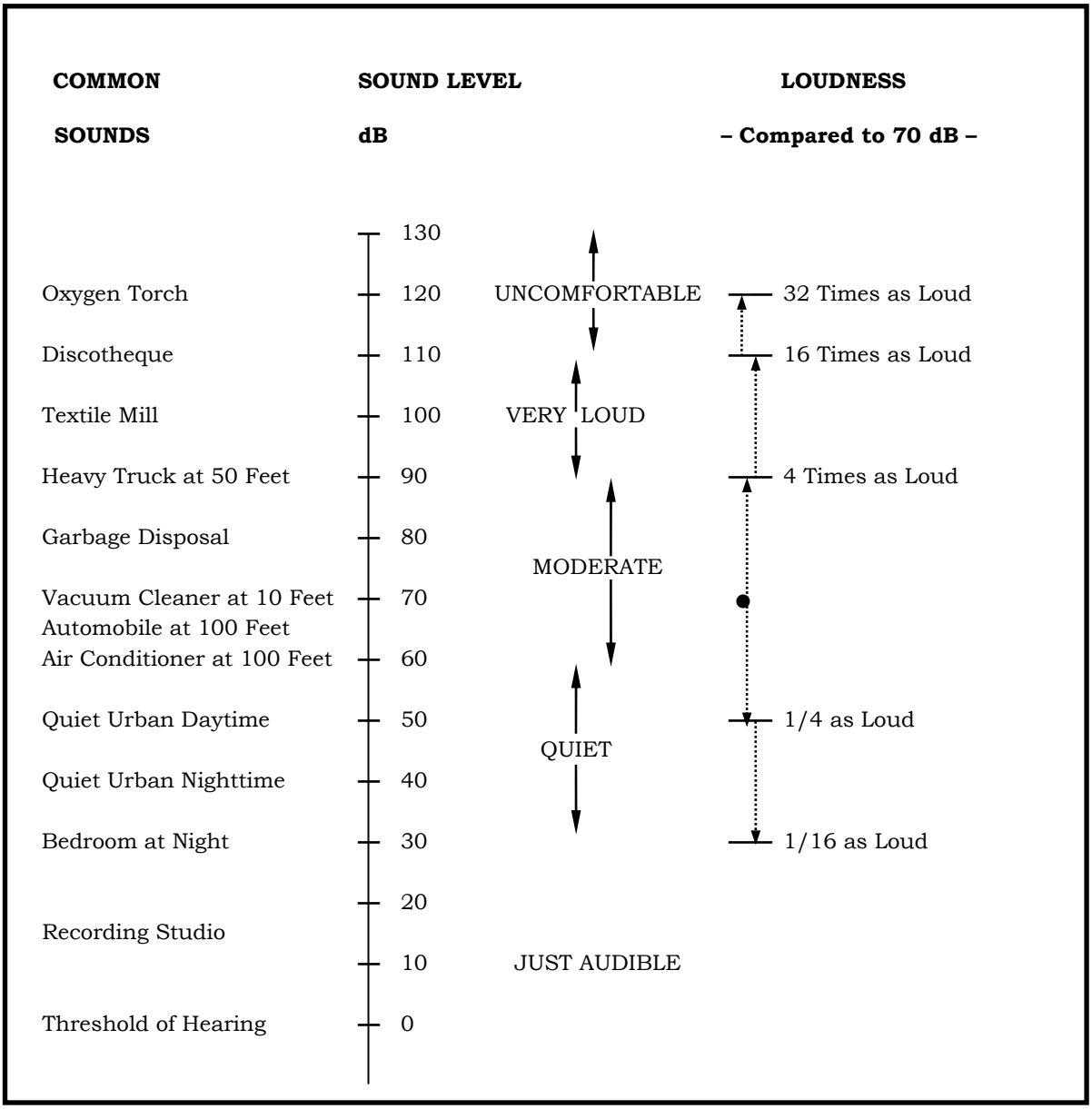
There has been continuing research on noise metrics and the importance of sound quality, sponsored by the Department of Defense (DoD) for military aircraft noise and by the Federal Aviation Administration (FAA) for civil aircraft noise. The metric L_{dnmr}, which is described later and accounts for the increased annoyance of rapid onset rate of sound, is a product of this long-term research.

The amplitude of A-weighted sound levels is measured in dB. It is common for some noise analysts to denote the unit of A-weighted sounds by dBA. As long as the use of A-weighting is understood, there is no difference between dB and dBA: it is only important that the use of A-weighting be made clear. In this environmental analysis, A-weighted sound levels are reported as dB.

A-weighting is appropriate for continuous sounds, which are perceived by the ear. Impulsive sounds, such as sonic booms, are perceived by more than just the ear. When experienced indoors, there can be secondary noise from rattling of the building. Vibrations may also be felt. C-weighting (American National Standards Institute 1988) is applied to such sounds. This is a frequency weighting that is relatively flat over the range of human hearing (about 20 Hz to 20,000 Hz) that rolls off above 5,000 Hz and below 50 Hz. In this study, C-weighted sound levels are used for the assessment of sonic booms and other impulsive sounds. As with A-weighting, the unit is dB, but dBC is sometimes used for clarity. In this study, sound levels are reported in both A-weighting and C-weighting dBs, and C-weighted metrics are denoted when used.

***Time Averaging*.** Sound pressure of a continuous sound varies greatly with time, so it is customary to deal with sound levels that represent averages over time. Levels presented as instantaneous (i.e., as might be read from the display of a sound level meter) are based on averages of sound energy over either 1/8 second (fast) or 1 second (slow). The formal definitions of fast and slow levels are somewhat complex, with details that are important to the makers and users of instrumentation. They may, however, be thought of as levels corresponding to the root-mean-square sound pressure measured over the 1/8-second or 1-second periods.

The most common uses of the fast or slow sound level in environmental analysis is in the discussion of the maximum sound level that occurs from the action, and in discussions of typical sound levels. Figure H-1 is a chart of A-weighted sound levels from typical sounds. Some (air conditioner, vacuum cleaner) are continuous sounds whose levels are constant for some time. Some (automobile, heavy truck) are the maximum sound during a vehicle passby. Some (urban daytime, urban nighttime) are averages over some extended period. A variety of noise metrics have been developed to describe noise over different time periods. These are described in Section 1.2.



Source: *Handbook of Noise Control*, C.M. Harris, Editor, McGraw-Hill Book Co., 1979, and FICON 1992.

Figure H-1. Typical A-Weighted Sound Levels of Common Sounds

1.2 Noise Metrics

Maximum Sound Level

The highest A-weighted sound level measured during a single event in which the sound level changes value as time goes on (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level, for short. It is usually abbreviated by ALM, L_{max}, or L_{Amax}. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleeping, or other common activities. Table H-1 reflects L_{max} values for typical aircraft associated with this assessment operating at the indicated flight profiles and power settings.

Table H-1. Representative Maximum Sound Levels (L_{max})

Aircraft (engine type)	*Power Setting*	*Power Unit*	L_{MAX} VALUES (IN DBA) AT VARYING DISTANCES (IN FEET)				
			500	*1,000*	*2,000*	*5,000*	*10,000*
Takeoff/Departure Operations (at 300 knots airspeed)							
A-10A	6200	NF	99.9	91.7	82.2	68.2	57.8
B-1	97.5%	RPM	126.5	118.3	109.9	98.3	88.7
F-15 (P220)	90%	NC	111.4	104.3	96.6	85	74.7
F-16 (P229)	93%	NC	113.7	106.2	98.1	86.1	75.7
F-22	100%	ETR	119.7	112.4	104.6	93	82.9
Landing/Arrival Operations (at 160 knots airspeed)							
A-10A	5225	NF	97	88.9	78.8	60.2	46.4
B-1	90%	RPM	98.8	91.9	84.5	72.8	62
F-15 (P220)	75%	NC	88.5	81.6	74.3	63.2	53.4
F-16 (P229)	83.5%	NC	92.6	85.5	77.8	66.1	55.6
F-22	43%	ETR	111.3	103.9	95.9	83.9	73.1

Engine Unit of Power: RPM—Revolutions Per Minute; ETR—Engine Thrust Ratio; NC—Engine Core RPM; and NF—Engine Fan RPM.
Source: SELCalc2 (Flyover Noise Calculator), Using Noisemap 6/7 and Maximum Omega10 Result as the defaults.

Peak Sound Level

For impulsive sounds, the true instantaneous sound pressure is of interest. For sonic booms, this is the peak pressure of the shock wave, as described in Section 3.2 of this appendix. This pressure is usually presented in physical units of pounds per square foot. Sometimes it is represented on the decibel scale, with symbol Lpk. Peak sound levels do not use either A or C weighting.

Sound Exposure Level

Individual time-varying noise events have two main characteristics: a sound level that changes throughout the event and a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (abbreviated SEL or L_{AE} for A-weighted sounds) combines both of these characteristics into a single metric.

SEL is a composite metric that represents both the intensity of a sound and its duration. Mathematically, the mean square sound pressure is computed over the duration of the event, then multiplied by the duration in seconds, and the resultant product is turned into a sound level. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that SEL measures this impact much more reliably than just the maximum sound level. Table H-2 shows SEL values corresponding to the aircraft and power settings reflected in Table H-1.

Table H-2. Representative Sound Exposure Levels (SEL)

Aircraft (engine type)	*Power Setting*	*Power Unit*	SEL VALUES (IN DBA) AT VARYING DISTANCES (IN FEET)				
			500	*1,000*	*2,000*	*5,000*	*10,000*
Takeoff/Departure Operations (at 300 knots airspeed)							
A-10A	6200	NF	102.6	96.2	88.5	76.9	68.3
B-1	97.5%	RPM	129.5	123.1	116.5	107.3	99.3
F-15 (P220)	90%	NC	117.3	112	106.1	97	88.4
F-16 (P229)	93%	NC	116.5	110.8	104.6	95	86.3
F-22	100%	ETR	124.2	118.7	112.7	103.5	95.2
Landing/Arrival Operations (at 160 knots airspeed)							
A-10A	5225	NF	97.9	91.5	83.3	67	55
B-1	90%	RPM	103.4	98.3	92.7	83.4	74.4
F-15 (P220)	75%	NC	94.2	89.2	83.6	74.9	66.9
F-16 (P229)	83.5%	NC	97.4	92.1	86.3	76.9	68.2
F-22	43%	ETR	114.9	109.3	103.1	93.5	84.5

Engine Unit of Power: RPM—Revolutions Per Minute; ETR—Engine Thrust Ratio; NC—Engine Core RPM; and NF—Engine Fan RPM.
Source: SELCalc2 (Flyover Noise Calculator), Using Noisemap 6/7 and Maximum Omega10 Result as the defaults.

Because the SEL and the maximum sound level are both used to describe single events, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

SEL can be computed for C-weighted levels (appropriate for impulsive sounds), and the results denoted CSEL or L_{CE}. SEL for A-weighted sound is sometimes denoted ASEL. Within this study, SEL is used for A-weighted sounds and CSEL for C-weighted.

Equivalent Sound Level

For longer periods of time, total sound is represented by the equivalent continuous sound pressure level (L_{eq}). L_{eq} is the average sound level over some time period (often an hour or a day, but any explicit time span can be specified), with the averaging being done on the same energy basis as used for SEL. SEL and L_{eq} are closely related, with L_{eq} being SEL over some time period normalized by that time.

Just as SEL has proven to be a good measure of the noise impact of a single event, L_{eq} has been established to be a good measure of the impact of a series of events during a given time period. Also, while Leq is defined as an average, it is effectively a sum over that time period and is, thus, a measure of the cumulative impact of noise.

Day-Night Average Sound Level

Noise tends to be more intrusive at night than during the day. This effect is accounted for by applying a 10 dB penalty to events that occur after 10 pm and before 7 am. If L_{eq} is computed over a 24-hour period with this nighttime penalty applied, the result is the DNL. DNL is the community noise metric recommended by the USEPA (United States Environmental Protection Agency [USEPA] 1974) and has been adopted by most federal agencies (Federal Interagency Committee on Noise 1992). It has been well established that DNL correlates well with long-term community response to noise (Schultz 1978; Finegold *et al.* 1994). This correlation is presented in Section 1.3 of this appendix.

DNL accounts for the total, or cumulative, noise impact at a given location, and for this reason is often referred to as a "cumulative" metric.

It was noted earlier that, for impulsive sounds, such as sonic booms, C-weighting is more appropriate than A-weighting. The day-night average sound level computed with C-weighting is denoted CDNL or L_{Cdn}. This procedure has been standardized, and impact interpretive criteria similar to those for DNL have been developed (Committee on Hearing, Bioacoustics and Biomechanics 1981).

Onset-Adjusted Monthly Day-Night Average Sound Level

Aircraft operations in military training airspace generate a noise environment somewhat different from other community noise environments. Overflights are sporadic, occurring at random times and varying from day to day and week to week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned. Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high-airspeed flyover can have a rather sudden onset.

To represent these differences, the conventional DNL metric is adjusted to account for the "surprise" effect of the sudden onset of aircraft noise events on humans (Plotkin *et al.* 1987; Stusnick *et al.* 1992; Stusnick *et al.* 1993). For aircraft exhibiting a rate of increase in sound level (called onset rate) of from 15 to 150 dB per second, an adjustment or penalty ranging from 0 to 11 dB is added to the normal SEL. Onset rates above 150 dB per second require an 11 dB penalty, while onset rates below 15 dB per second require no adjustment. The DNL is then determined in the same manner as for conventional aircraft noise events and is designated as Onset-Rate Adjusted Day-Night Average Sound Level (abbreviated L_{dnmr}).

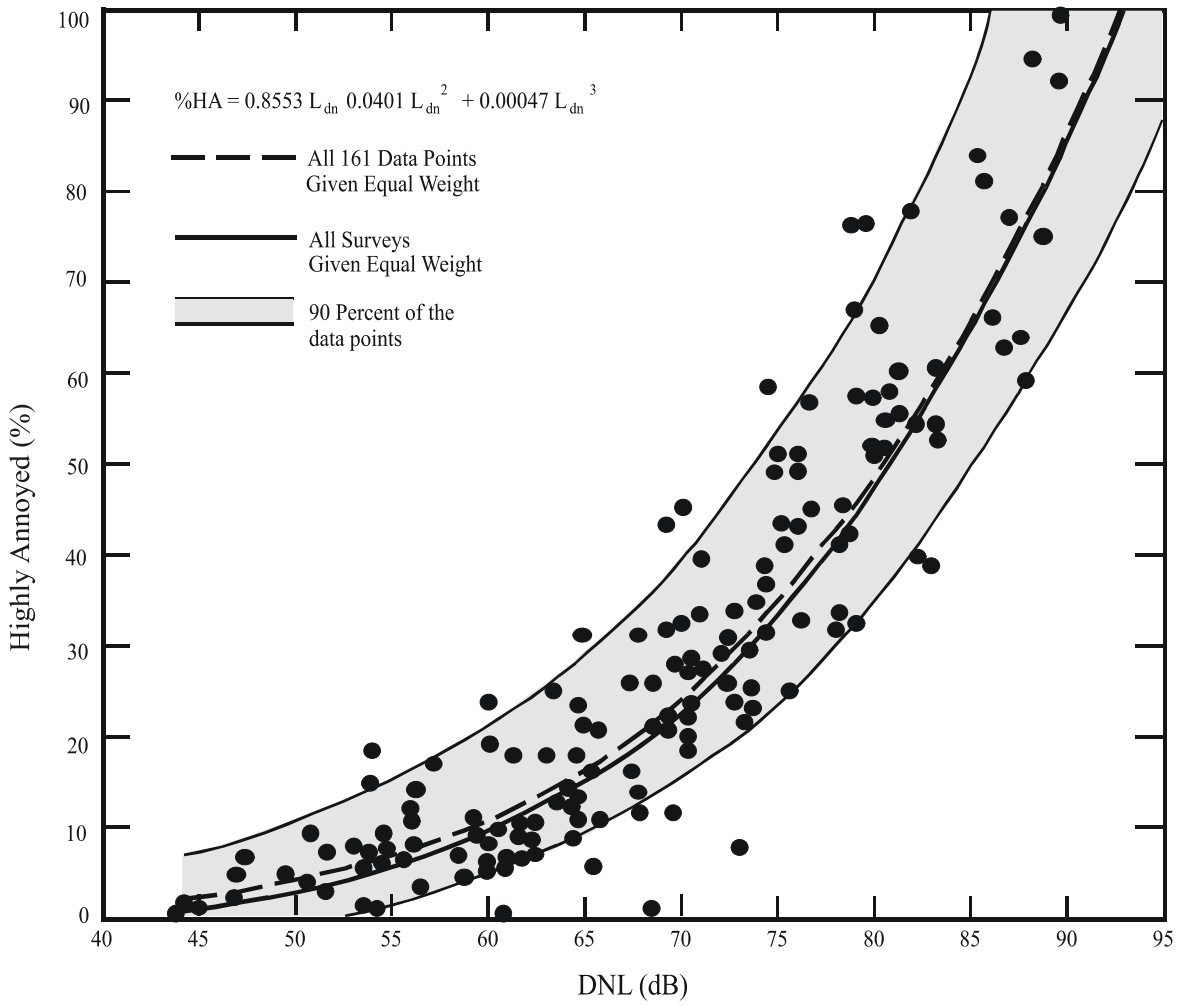
Because of the irregular occurrences of aircraft operations, the number of average daily operations is determined by using the calendar month with the highest number of operations. The monthly average is denoted L_{dnmr}. Noise levels are calculated the same way for both DNL and L_{dnmr}. L_{dnmr} is interpreted by the same criteria as used for DNL.

1.3 Noise Impact

Community Reaction

Studies of long-term community annoyance to numerous types of environmental noise show that DNL correlates well with the annoyance. Schultz (1978) showed a consistent relationship between DNL and annoyance. Shultz's original curve fit (Figure H-2) shows that there is a remarkable consistency in results

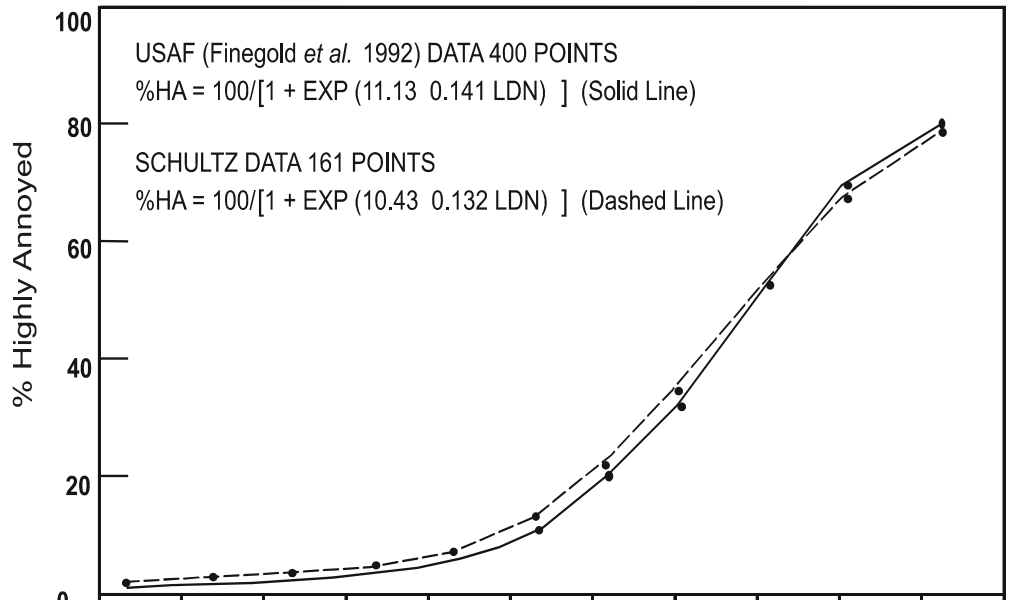
of attitudinal surveys which relate the percentages of groups of people who express various degrees of annoyance when exposed to different DNL.



Source: Schultz 1978

Figure H-2. Community Surveys of Noise Annoyance

A more recent study has reaffirmed this relationship (Fidell *et al.* 1991). Figure H-3 (Federal Interagency Committee on Noise 1992) shows an updated form of the curve fit (Finegold *et al.* 1994) in comparison with the original. The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors that influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.



Day-Night Average Sound Level in dB	40	45	50	55	60	65	70	75	80	85	90
Calculated %HA Points: USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
Calculated %HA Points: SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Figure H-3. Response of Communities to Noise; Comparison of Original (Schultz 1978) and Current (Finegold *et al.* 1994) Curve Fits

As noted earlier for SEL, DNL does not represent the sound level heard at any particular time, but rather represents the total sound exposure. DNL accounts for the sound level of individual noise events, the duration of those events, and the number of events. Its use is endorsed by the scientific community (American National Standards Institute 1980, 1988, 2005; USEPA 1974; Federal Interagency Committee on Urban Noise 1980; Federal Interagency Committee on Noise 1992).

While DNL is the best metric for quantitatively assessing cumulative noise impact, it does not lend itself to intuitive interpretation by non-experts. Accordingly, it is common for environmental noise analyses to include other metrics for illustrative purposes. A general indication of the noise environment can be presented by noting the maximum sound levels which can occur and the number of times per day noise events will be loud enough to be heard. Use of other metrics as supplements to DNL has been endorsed by federal agencies (Federal Interagency Committee on Noise 1992).

The Schultz curve is generally applied to annual average DNL. In Section 1.2, L_{dnmr} was described and presented as being appropriate for quantifying noise in military airspace. The Schultz curve is used with L_{dnmr} as the noise metric. L_{dnmr} is always equal to or greater than DNL, so impact is generally higher than would have been predicted if the onset rate and busiest-month adjustments were not accounted for.

There are several points of interest in the noise-annoyance relation. The first is DNL of 65 dB. This is a level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like aviation which do cause noise. Areas exposed to DNL above 65 dB are generally not considered suitable for residential use. The second is DNL of 55 dB, which was identified by USEPA as a level "...requisite to protect the public health and welfare with an adequate margin of safety," (USEPA 1974) which is essentially a level below which adverse impact is not expected. The third is DNL of 75 dB. This is the lowest level at which adverse health effects could be credible (USEPA 1974). The very high annoyance levels correlated with DNL of 75 dB make such areas unsuitable for residential land use.

Sonic boom exposure is measured by C-weighting, with the corresponding cumulative metric being CDNL. Correlation between CDNL and annoyance has been established, based on community reaction to impulsive sounds (Committee on Hearing, Bioacoustics and Biomechanics 1981). Values of the C-weighted equivalent to the Schultz curve are different than that of the Schultz curve itself. Table H-3 shows the relation between annoyance, DNL, and CDNL.

Table H-3. Relation Between Annoyance, DNL and CDNL

DNL	*% Highly Annoyed*	*CDNL*
45	0.83	42
50	1.66	46
55	3.31	51
60	6.48	56
65	12.29	60
70	22.10	65

Interpretation of CDNL from impulsive noise is accomplished by using the CDNL versus annoyance values in Table H-3. CDNL can be interpreted in terms of an "equivalent annoyance" DNL. For example, CDNL of 52, 61, and 69 dB are equivalent to DNL of 55, 65, and 75 dB, respectively. If both continuous and impulsive noise occurs in the same area, impacts are assessed separately for each.

Land Use Compatibility

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the DNL or L_{dnmr} for military overflights. Impulsive noise can be assessed by relating CDNL to an "equivalent annoyance" DNL, as outlined in Section 1.3.1.

In June 1980, an ad hoc Federal Interagency Committee on Urban Noise published guidelines (Federal Interagency Committee on Urban Noise 1980) relating DNL to compatible land uses. This committee was composed of representatives from DoD, Transportation, and Housing and Urban Development; USEPA; and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

Following the lead of the committee, DoD and FAA adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. The FAA included the committee's guidelines in the Federal Aviation Regulations (United States Department of Transportation 1984). These guidelines are reprinted in Table H-4, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (note the footnote "*" in the table), they provide the best means for determining noise impact in airport communities. In general, residential land uses normally are not compatible with outdoor DNL values above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions. In some cases a change in noise level, rather than an absolute threshold, may be a more appropriate measure of impact.

Table H-4. Land-Use Compatibility With Yearly Day-Night Average Sound Levels

	Yearly Day-Night Average Sound Level (DNL) in Decibels					
Land Use	***Below 65***	***65–70***	***70–75***	***75–80***	***80–85***	***Over 85***
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoria, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail—building materials, hardware, and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

* The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE H-4

Y (YES) = Land Use and related structures compatible without restrictions.

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

NLR = Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, or 35 = Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.

NOTES FOR TABLE H-4

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential 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 and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.

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

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

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

(5) Land-use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

2.0 NOISE EFFECTS

The discussion in Section 1.3 presents the global effect of noise on communities. The following sections describe particular noise effects.

2.1 Hearing Loss

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal workplace standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4,000 Hz, after a 40-year exposure suggests a time-average sound level of 70 dB over a 24-hour period (USEPA 1974). Since it is unlikely that airport neighbors will remain outside their homes 24 hours per day for extended periods of time, there is little possibility of hearing loss below a DNL of 75 dB, and this level is extremely conservative.

2.2 Nonauditory Health Effects

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have not been found to occur at levels below those protective against noise-induced hearing loss, described above. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in workplace conditions. The best scientific summary of these findings is contained in the lead paper at the National Institutes of Health Conference on Noise and Hearing Loss, held on January 22–24, 1990, in Washington, D.C., which states "The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an eight-hour day)" (von Gierke 1990; parenthetical wording added for clarification). At the International Congress (1988) on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss; and even above these criteria, results regarding such health effects were ambiguous.

Consequently, it can be concluded that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place.

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous, at best, and often contradictory. Yet, even those studies which purport to find such health effects use time-average noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two University of California at Los Angeles researchers found a relation between aircraft noise levels under the approach path to Los Angeles International Airport and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the "noise-exposed" population (Meecham and Shaw 1979). Nevertheless, three other

University of California at Los Angeles professors analyzed those same data and found no relation between noise exposure and mortality rates (Frerichs *et al*. 1980).

As a second example, two other University of California at Los Angeles researchers used this same population near Los Angeles International Airport to show a higher rate of birth defects during the period of 1970 to 1972 when compared with a control group residing away from the airport (Jones and Tauscher 1978). Based on this report, a separate group at the United States Centers for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970 to 1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds 1979).

A recent review of health effects, prepared by a Committee of the Health Council of The Netherlands (Committee of the Health Council of the Netherlands 1996), analyzed currently available published information on this topic. The committee concluded that the threshold for possible long-term health effects was a 16-hour (6:00 a.m. to 10:00 p.m.) L_{eq} of 70 dB. Projecting this to 24 hours and applying the 10 dB nighttime penalty used with DNL, this corresponds to DNL of about 75 dB. The study also affirmed the risk threshold for hearing loss, as discussed earlier.

In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

2.3 Annoyance

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the USEPA as any negative subjective reaction on the part of an individual or group (USEPA 1974). As noted in the discussion of DNL above, community annoyance is best measured by that metric.

Because the USEPA Levels Document (USEPA 1974) identified DNL of 55 dB as ". . . requisite to protect public health and welfare with an adequate margin of safety," it is commonly assumed that 55 dB should be adopted as a criterion for community noise analysis. From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified DNL of 65 dB as a criterion which protects those most impacted by noise, and which can often be achieved on a practical basis (Federal Interagency Committee on Noise 1992). This corresponds to about 12 percent of the exposed population being highly annoyed.

Although DNL of 65 dB is widely used as a benchmark for significant noise impact, and is often an acceptable compromise, it is not a statutory limit, and it is appropriate to consider other thresholds in particular cases.

In this analysis, no specific threshold is used. The noise in the affected environment is evaluated on the basis of the information presented in this appendix and in the body of the environmental analysis.

Community annoyance from sonic booms is based on CDNL, as discussed in Section 1.3. These effects are implicitly included in the "equivalent annoyance" CDNL values in Table H-3, since those were developed from actual community noise impact.

2.4 Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities in the home, such as radio or television listening, telephone use, or family conversation, gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that the use of the SEL metric will measure speech interference successfully, and that a SEL exceeding 65 dB will begin to interfere with speech communication.

2.5 Sleep Interference

Sleep interference is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning.

Sleep interference may be measured in either of two ways. "Arousal" represents actual awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without actual awakening. In general, arousal requires a somewhat higher noise level than does a change in sleep stage.

An analysis sponsored by the Air Force summarized 21 published studies concerning the effects of noise on sleep (Pearsons *et al*. 1989). The analysis concluded that a lack of reliable in-home studies, combined with large differences among the results from the various laboratory studies, did not permit development of an acceptably accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions. A recent extensive study of sleep interference in people's own homes (Ollerhead 1992) showed very little disturbance from aircraft noise.

There is some controversy associated with the recent studies, so a conservative approach should be taken in judging sleep interference. Based on older data, the USEPA identified an indoor DNL of 45 dB as necessary to protect against sleep interference (USEPA 1974). Assuming a very conservative structural noise insulation of 20 dB for typical dwelling units, this corresponds to an outdoor DNL of 65 dB as minimizing sleep interference.

A 1984 publication reviewed the probability of arousal or behavioral awakening in terms of SEL (Kryter 1984). Figure H-4, extracted from Figure 10.37 of Kryter (1984), indicates that an indoor SEL of 65 dB or lower should awaken less than 5 percent of those exposed. These results do not include any habituation over time by sleeping subjects. Nevertheless, this provides a reasonable guideline for assessing sleep interference and corresponds to similar guidance for speech interference, as noted above.

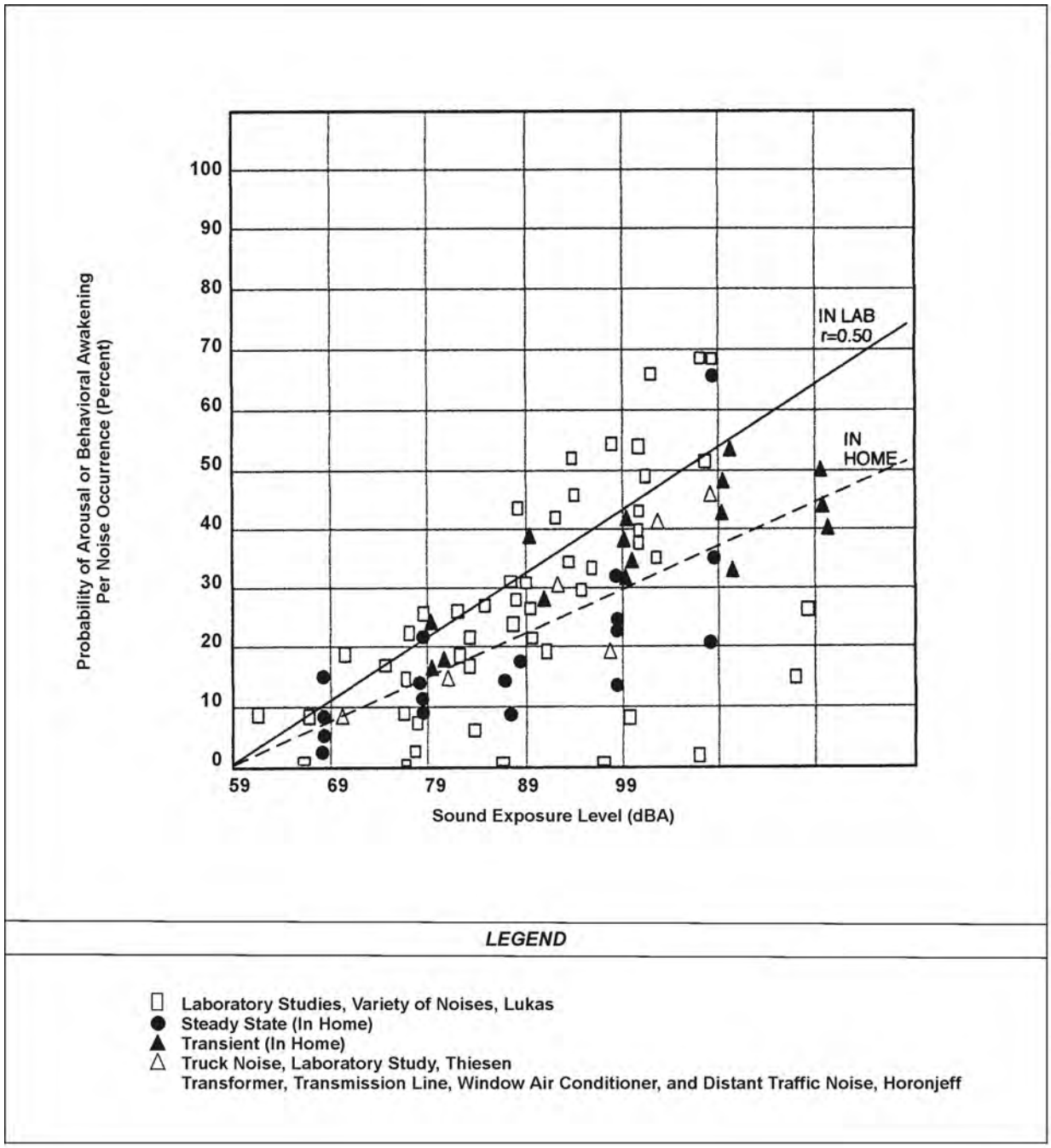


Figure H-4 Probability of Arousal or Behavioral Awakening in Terms of Sound Exposure Level

2.6 Noise Effects on Domestic Animals and Wildlife

Animal species differ greatly in their responses to noise. Each species has adapted, physically and behaviorally, to fill its ecological role in nature, and its hearing ability usually reflects that role. Animals rely on their hearing to avoid predators, obtain food, and communicate with and attract other members of their species. Aircraft noise may mask or interfere with these functions. Secondary effects may

include nonauditory effects similar to those exhibited by humans: stress, hypertension, and other nervous disorders. Tertiary effects may include interference with mating and resultant population declines.

2.7 Noise Effects on Structures

Subsonic Aircraft Noise

Normally, the most sensitive components of a structure to airborne noise are the windows and, infrequently, the plastered walls and ceilings. An evaluation of the peak sound pressures impinging on the structure is normally sufficient to determine the possibility of damage. In general, at sound levels above 130 dB, there is the possibility of the excitation of structural component resonance. While certain frequencies (such as 30 Hz for window breakage) may be of more concern than other frequencies, conservatively, only sounds lasting more than one second above a sound level of 130 dB are potentially damaging to structural components (National Research Council/National Academy of Sciences 1977).

A study directed specifically at low-altitude, high-speed aircraft showed that there is little probability of structural damage from such operations (Sutherland 1989). One finding in that study is that sound levels at damaging frequencies (e.g., 30 Hz for window breakage or 15 to 25 Hz for whole-house response) are rarely above 130 dB.

Noise-induced structural vibration may also cause annoyance to dwelling occupants because of induced secondary vibrations, or “rattle,” of objects within the dwelling, such as hanging pictures, dishes, plaques, and bric-a-brac. Window panes may also vibrate noticeably when exposed to high levels of airborne noise, causing homeowners to fear breakage. In general, such noise-induced vibrations occur at sound levels above those considered normally incompatible with residential land use. Thus assessments of noise exposure levels for compatible land use should also be protective of noise-induced secondary vibrations.

Sonic Booms

Sonic booms are commonly associated with structural damage. Most damage claims are for brittle objects, such as glass and plaster. Table H-5 summarizes the threshold of damage that might be expected at various overpressures. There is a large degree of variability in damage experience, and much damage depends on the pre-existing condition of a structure. Breakage data for glass, for example, spans a range of two to three orders of magnitude at a given overpressure. At 1 psf, the probability of a window breaking ranges from one in a billion (Sutherland 1990) to one in a million (Hershey and Higgins 1976). These damage rates are associated with a combination of boom load and glass condition. At 10 psf, the probability of breakage is between one in a hundred and one in a thousand. Laboratory tests of glass (White 1972) have shown that properly installed window glass will not break at overpressures below 10 psf, even when subjected to repeated booms, but in the real world glass is not in pristine condition.

Table H-5. Possible Damage to Structures From Sonic Booms

Sonic Boom Overpressure Nominal (psf)	*Type of Damage*	*Item Affected*
0.5 - 2	Plaster	Fine cracks; extension of existing cracks; more in ceilings; over door frames; between some plaster boards.
	Glass	Rarely shattered; either partial or extension of existing.
	Roof	Slippage of existing loose tiles/slates; sometimes new cracking of old slates at nail hole.
	Damage to outside walls	Existing cracks in stucco extended.
	Bric-a-brac	Those carefully balanced or on edges can fall; fine glass, such as large goblets, can fall and break.
	Other	Dust falls in chimneys.
2 - 4	Glass, plaster, roofs, ceilings	Failures show that would have been difficult to forecast in terms of their existing localized condition. Nominally in good condition.
4 - 10	Glass	Regular failures within a population of well-installed glass; industrial as well as domestic greenhouses.
	Plaster	Partial ceiling collapse of good plaster; complete collapse of very new, incompletely cured, or very old plaster.
	Roofs	High probability rate of failure in nominally good state, slurry-wash; some chance of failures in tiles on modern roofs; light roofs (bungalow) or large area can move bodily.
	Walls (out)	Old, free standing, in fairly good condition can collapse.
	Walls (in)	Inside ("party") walls known to move at 10 psf.
Greater than 10	Glass	Some good glass will fail regularly to sonic booms from the same direction. Glass with existing faults could shatter and fly. Large window frames move.
	Plaster	Most plaster affected.
	Ceilings	Plaster boards displaced by nail popping.
	Roofs	Most slate/slurry roofs affected, some badly; large roofs having good tile can be affected; some roofs bodily displaced causing gale-end and will-plate cracks; domestic chimneys dislodged if not in good condition.
	Walls	Internal party walls can move even if carrying fittings such as hand basins or taps; secondary damage due to water leakage.
	Bric-a-brac	Some nominally secure items can fall; e.g., large pictures, especially if fixed to party walls.

Source: Haber and Nakaki 1989

Damage to plaster occurs at similar ranges to glass damage. Plaster has a compounding issue in that it will often crack due to shrinkage while curing, or from stresses as a structure settles, even in the absence of outside loads. Sonic boom damage to plaster often occurs when internal stresses are high from these factors.

Some degree of damage to glass and plaster should thus be expected whenever there are sonic booms, but usually at the low rates noted above. In general, structural damage from sonic booms should be expected only for overpressures above 10 psf.

2.8 Noise Effects on Terrain

Subsonic Aircraft Noise

Members of the public often believe that noise from low-flying aircraft can cause avalanches or landslides by disturbing fragile soil or snow structures in mountainous areas. There are no known instances of such effects, and it is considered improbable that such effects will result from routine, subsonic aircraft operations.

Sonic Booms

In contrast to subsonic noise, sonic booms are considered to be a potential trigger for snow avalanches. Avalanches are highly dependent on the physical status of the snow, and do occur spontaneously. They can be triggered by minor disturbances, and there are documented accounts of sonic booms triggering avalanches. Switzerland routinely restricts supersonic flight during avalanche season.

Landslides are not an issue for sonic booms. There was one anecdotal report of a minor landslide from a sonic boom generated by the Space Shuttle during landing, but there is no credible mechanism or consistent pattern of reports.

2.9 Noise Effects on Historical and Archaeological Sites

Because of the potential for increased fragility of structural components of historical buildings and other historical sites, aircraft noise may affect such sites more severely than newer, modern structures. Again, there are few scientific studies of such effects to provide guidance for their assessment.

One study involved the measurements of sound levels and structural vibration levels in a superbly restored plantation house, originally built in 1795, and now situated approximately 1,500 feet from the centerline at the departure end of Runway 19L at Washington Dulles International Airport. These measurements were made in connection with the proposed scheduled operation of the supersonic Concorde airplane at Dulles (Wesler 1977). There was special concern for the building's windows, since roughly half of the 324 panes were original. No instances of structural damage were found. Interestingly, despite the high levels of noise during Concorde takeoffs, the induced structural vibration levels were actually less than those induced by touring groups and vacuum cleaning within the building itself.

As noted above for the noise effects of noise-induced vibrations on normal structures, assessments of noise exposure levels for normally compatible land uses should also be protective of historic and archaeological sites.

3.0 NOISE MODELING

3.1 Subsonic Aircraft Noise

An aircraft in subsonic flight generally emits noise from two sources: the engines and flow noise around the airframe. Noise generation mechanisms are complex and, in practical models, the noise sources must be based on measured data. The Air Force has developed a series of computer models and aircraft

noise databases for this purpose. The models include NOISEMAP (Moulton 1992) for noise around airbases, and MR_NMAP (Lucas and Calamia 1996) for use in MOAs, ranges, and low-level training routes. These models use the NOISEFILE database developed by the Air Force. NOISEFILE data includes SEL and L_{Amax} as a function of speed and power setting for aircraft in straight flight.

Noise from an individual aircraft is a time-varying continuous sound. It is first audible as the aircraft approaches, increases to a maximum when the aircraft is near its closest point, then diminishes as it departs. The noise depends on the speed and power setting of the aircraft and its trajectory. The models noted above divide the trajectory into segments whose noise can be computed from the data in NOISEFILE. The contributions from these segments are summed.

MR_NMAP was used to compute noise levels in the airspace. The primary noise metric computed by MR_NMAP was L_{dnmr} averaged over each airspace. Supporting routines from NOISEMAP were used to calculate SEL and L_{Amax} for various flight altitudes and lateral offsets from a ground receiver position.

3.2 Sonic Booms

When an aircraft moves through the air, it pushes the air out of its way. At subsonic speeds, the displaced air forms a pressure wave that disperses rapidly. At supersonic speeds, the aircraft is moving too quickly for the wave to disperse, so it remains as a coherent wave. This wave is a sonic boom. When heard at the ground, a sonic boom consists of two shock waves (one associated with the forward part of the aircraft, the other with the rear part) of approximately equal strength and (for fighter aircraft) separated by 100 to 200 milliseconds. When plotted, this pair of shock waves and the expanding flow between them have the appearance of a capital letter “N,” so a sonic boom pressure wave is usually called an “N-wave.” An N-wave has a characteristic "bang-bang" sound that can be startling. Figure H-5 shows the generation and evolution of a sonic boom N-wave under the aircraft. Figure H-6 shows the sonic boom pattern for an aircraft in steady supersonic flight. The boom forms a cone that is said to sweep out a “carpet” under the flight track.

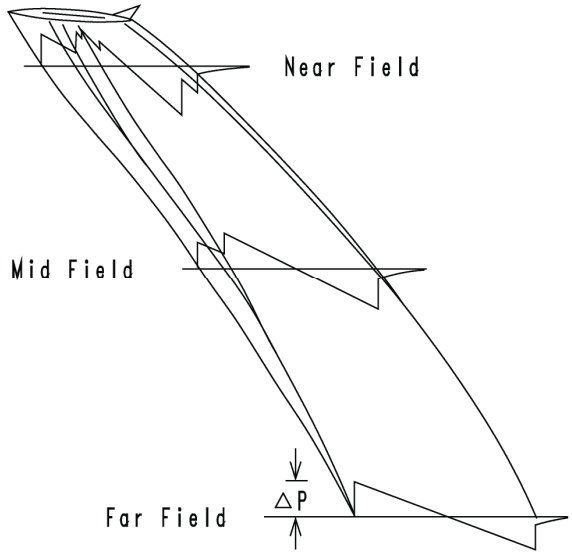


Figure H-5. Sonic Boom Generation and Evolution to N-Wave

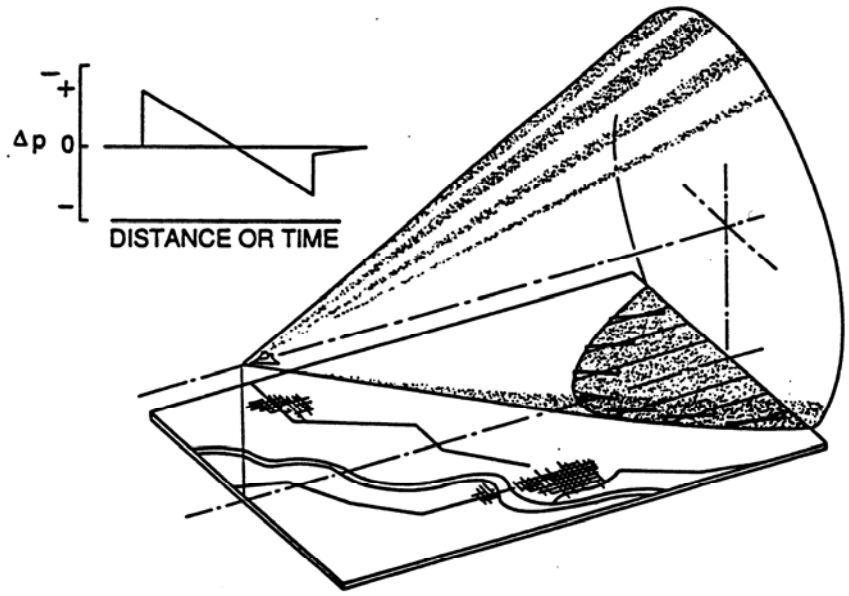


Figure H-6. Sonic Boom Carpet in Steady Flight

The complete ground pattern of a sonic boom depends on the size, shape, speed, and trajectory of the aircraft. Even for a nominally steady mission, the aircraft must accelerate to supersonic speed at the start, decelerate back to subsonic speed at the end, and usually change altitude. Figure H-7 illustrates the complexity of a nominal full mission.

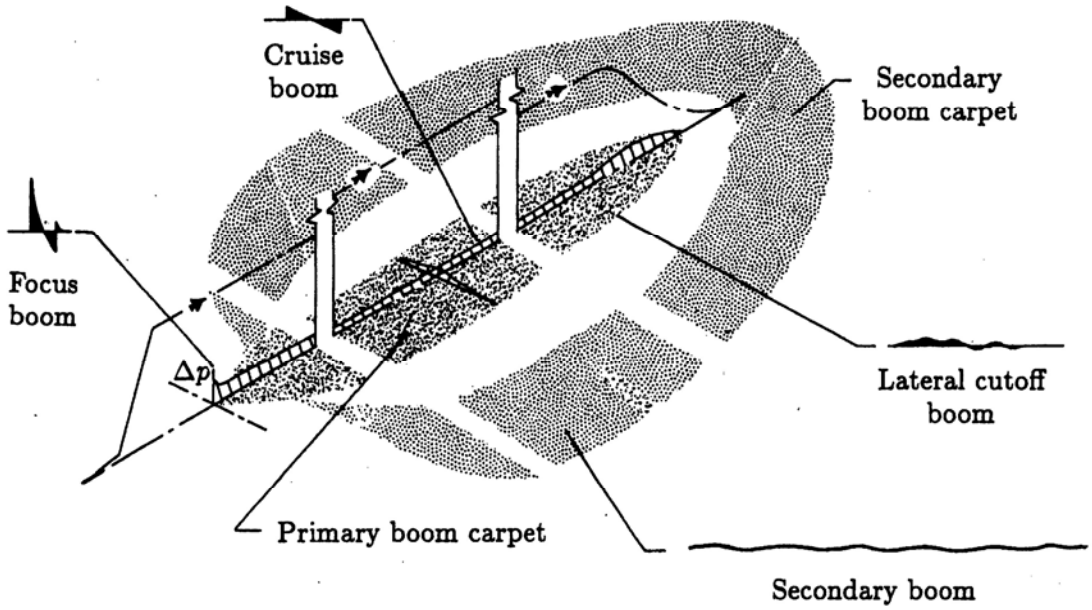


Figure H-7. Complex Sonic Boom Pattern for Full Mission

The Air Force's PCBoom4 computer program (Plotkin and Grandi 2002) can be used to compute the complete sonic boom footprint for a given single event, accounting for details of a particular maneuver.

Supersonic operations for the proposed action and alternatives are, however, associated with air combat training, which cannot be described in the deterministic manner that PCBoom4 requires. Supersonic events occur as aircraft approach an engagement, break at the end, and maneuver for advantage during the engagement. Long time cumulative sonic boom exposure, CDNL, is meaningful for this kind of environment.

Long-term sonic boom measurement projects have been conducted in four supersonic air combat training airspaces: White Sands, New Mexico (Plotkin *et al.* 1989); the eastern portion of the Goldwater Range, Arizona (Plotkin *et al.* 1992); the Elgin MOA at Nellis AFB, Nevada (Frampton *et al.* 1993); and the western portion of the Goldwater Range (Page *et al.* 1994). These studies included analysis of schedule and air combat maneuvering instrumentation data and supported development of the 1992 BOOMAP model (Plotkin *et al.* 1992). The current version of BOOMAP (Frampton *et al.* 1993; Plotkin 1996) incorporates results from all four studies. Because BOOMAP is directly based on long-term measurements, it implicitly accounts for such variables as maneuvers, statistical variations in operations, atmosphere effects, and other factors.

Figure H-8 shows a sample of supersonic flight tracks measured in the air combat training airspace at White Sands (Plotkin *et al.* 1989). The tracks fall into an elliptical pattern aligned with preferred

engagement directions in the airspace. Figure H-9 shows the CDNL contours that were fit to six months of measured booms in that airspace. The subsequent measurement programs refined the fit, and demonstrated that the elliptical maneuver area is related to the size and shape of the airspace (Frampton *et al*. 1993). BOOMAP quantifies the size and shape of CDNL contours, and also numbers of booms per day, in air combat training airspaces. That model was used for prediction of cumulative sonic boom exposure in this analysis.

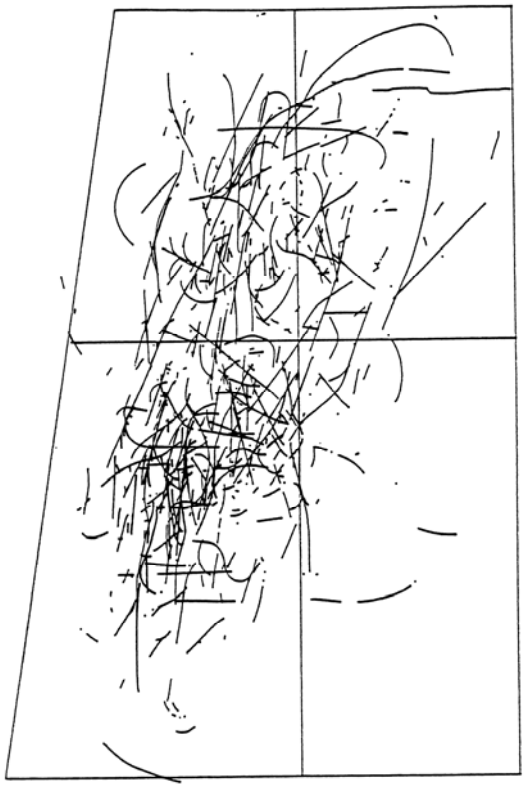


Figure H-8. Supersonic Flight Tracks in Supersonic Air Combat Training Airspace

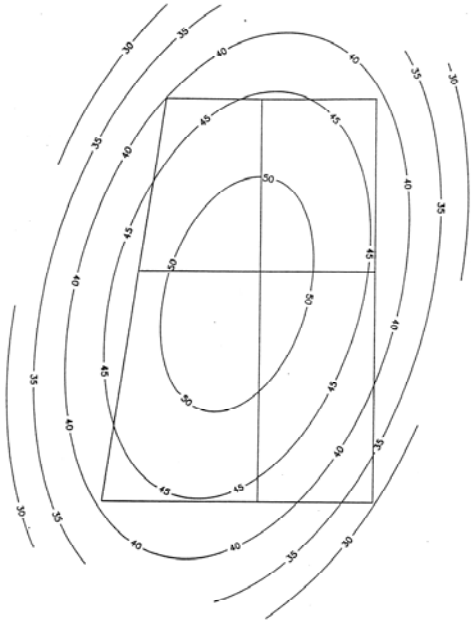


Figure H-9. Elliptical CDNL Contours in Supersonic Air Combat Training Airspace

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APPENDIX I
OBSTRUCTION MARKING AND LIGHTING

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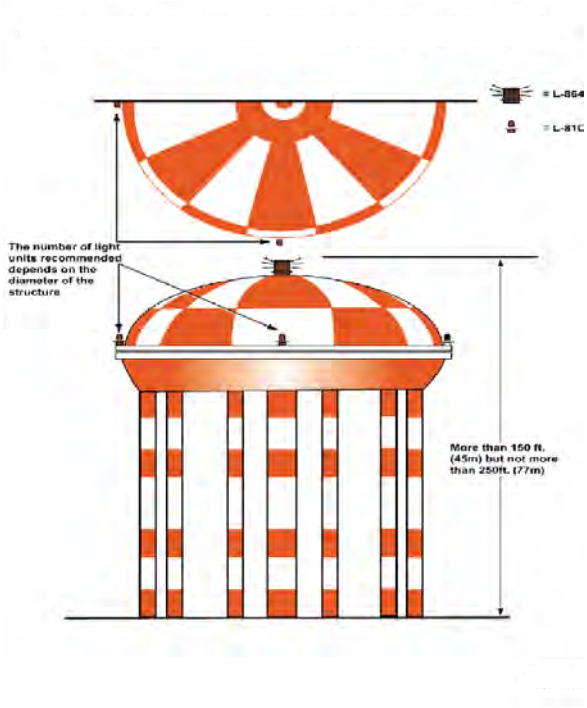
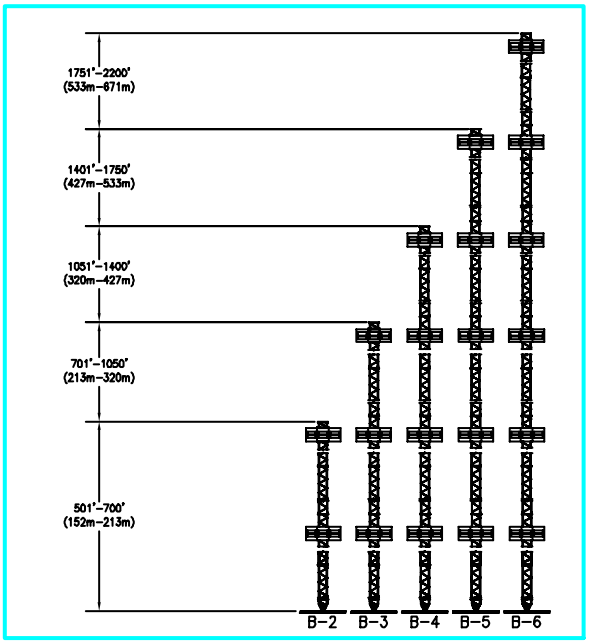
U.S. Department
of Transportation
Federal Aviation Administration

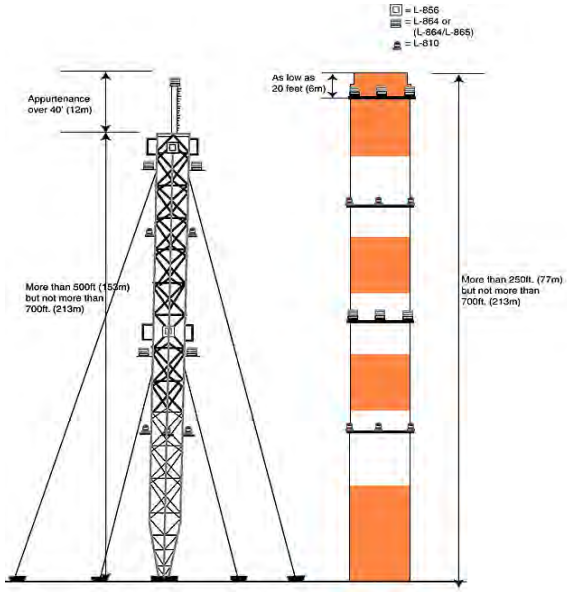
ADVISORY CIRCULAR

AC 70/7460-1K

Obstruction Marking and Lighting







Subject: CHANGE 2 TO OBSTRUCTION MARKING AND LIGHTING | **Date:** 2/1/07 | **AC No.:** 70/7460-1K
Initiated by: AJR-33 | **Change:** 2

1. PURPOSE. This change amends the Federal Aviation Administration's standards for marking and lighting structures to promote aviation safety. The change number and date of the change material are located at the top of the page.

2. EFFECTIVE DATE. This change is effective February 1, 2007.

3. EXPLANATION OF CHANGES.

   a. Table of Contents. Change pages i through iii.

   b. Page 1. Paragraph 1. **Reporting Requirements**. Incorporated the word "Title" in reference to the 14 Code of Federal Regulations (14 CFR part 77). FAA Regional Air Traffic Division office to read Obstruction Evaluation service (OES). FAA website to read http://oeaaa.faa.gov.

   c. Page 1. Paragraph 4. **Supplemental Notice Requirement** (subpart b). FAA Regional Air Traffic Division office to read OES.

   d. Page 1. Paragraph 5. **Modifications and Deviations** (subpart a). FAA Regional Air Traffic Division office to read OES.

   e. Page 1. Paragraph 5. **Modifications and Deviations** (subpart c). FAA Regional office to read OES.

   f. Page 2. Paragraph 5. **Modifications and Deviations** (subpart d). Removed period to create one sentence.

   g. Page 2. Paragraph 7. **Metric Units**. And to read however.

   h. Page 3. Paragraph 23. **Light Failure Notification** (subpart b). Nearest to read appropriate. FAA's website to read web. Website www.faa.gov/ats/ata/ata400 to read http://www.afss.com.

   i. Page 4. Paragraph 24. **Notification of Restoration**. Removed AFSS.

   j. Page 5. Paragraph 32. **Paint Standards**. Removed a comma after "Since".

   k. Page 5. Paragraph 33. **Paint Patterns** (subpart d. **Alternate Bands**). Removed number 6. Number 7 to read number 6.

   l. Page 9. Paragraph 41. **Standards**. TASC to read OTS. SVC-121.23 to read M-30.

m. Page 14. Paragraph 55. **Wind Turbine Structures**. Removed. The paragraph numbers that follow have been changed accordingly.

n. Page 18. Paragraph 65. **Wind Turbine Structures**. Removed. The paragraph numbers that follow have been changed accordingly.

o. Page 20. Paragraph 77. **Radio and Television Towers and Similar Skeletal Structures**. Excluding to read including.

p. Page 23. Paragraph 85. **Wind Turbine Structures**. Removed. The paragraph number that follows has been changed accordingly.

q. Page 33-34. Chapter 13. **Marking and Lighting Wind Turbine Farms**. Added.

r. Page A1-3. Appendix 1. Verbiage removed under first structure.

Nancy B Kalinowski

Nancy B. Kalinowski
Director, System Operations Airspace and Aeronautical Information Management

Remove Pages	Dated	Insert Pages	Dated
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9	3/1/00	9	1/1/07
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CHAPTER 1. ADMINISTRATIVE AND GENERAL PROCEDURES

1. REPORTING REQUIREMENTS

A sponsor proposing any type of construction or alteration of a structure that may affect the National Airspace System (NAS) is required under the provisions of Title 14 Code of Federal Regulations (14 CFR part 77) to notify the FAA by completing the Notice of Proposed Construction or Alteration form (FAA Form 7460-1). The form should be sent to the Obstruction Evaluation service (OES). Copies of FAA Form 7460-1 may be obtained from OES, Airports District Office or FAA Website at http://oeaaa.faa.gov.

2. PRECONSTRUCTION NOTICE

The notice must be submitted:

a. At least 30 days prior to the date of proposed construction or alteration is to begin.

b. On or before the date an application for a construction permit is filed with the Federal Communications Commission (FCC). (The FCC advises its applicants to file with the FAA well in advance of the 30-day period in order to expedite FCC processing.)

3. FAA ACKNOWLEDGEMENT

The FAA will acknowledge, in writing, receipt of each FAA Form 7460-1 notice received.

4. SUPPLEMENTAL NOTICE REQUIREMENT

a. If required, the FAA will include a FAA Form 7460-2, Notice of Actual Construction or Alteration, with a determination.

b. FAA Form 7460-2 Part 1 is to be completed and sent to the FAA at least 48 hours prior to starting the actual construction or alteration of a structure. Additionally, Part 2 shall be submitted no later than 5 days after the structure has reached its greatest height. The form should be sent to the OES.

c. In addition, supplemental notice shall be submitted upon abandonment of construction.

d. Letters are acceptable in cases where the construction/alteration is temporary or a proposal is abandoned. This notification process is designed to permit the FAA the necessary time to change affected procedures and/or minimum flight altitudes, and to otherwise alert airmen of the structure's presence.

Note-
NOTIFICATION AS REQUIRED IN THE DETERMINATION IS CRITICAL TO AVIATION SAFETY.

5. MODIFICATIONS AND DEVIATIONS

a. Requests for modification or deviation from the standards outlined in this AC must be submitted to the OES. The sponsor is responsible for adhering to approved marking and/or lighting limitations, and/or recommendations given, and should notify the FAA and FCC (for those structures regulated by the FCC) prior to removal of marking and/or lighting. A request received after a determination is issued may require a new study and could result in a new determination.

b. ***Modifications***. Modifications will be based on whether or not they impact aviation safety. Examples of modifications that may be considered:

1. ***Marking and/or Lighting Only a Portion of an Object.*** The object may be so located with respect to other objects or terrain that only a portion of it needs to be marked or lighted.

2. ***No Marking and/or Lighting***. The object may be so located with respect to other objects or terrain, removed from the general flow of air traffic, or may be so conspicuous by its shape, size, or color that marking or lighting would serve no useful purpose.

3. ***Voluntary Marking and/or Lighting***. The object may be so located with respect to other objects or terrain that the sponsor feels increased conspicuity would better serve aviation safety. Sponsors who desire to voluntarily mark and/or light their structure should request the proper marking and/or lighting from the FAA to ensure no aviation safety issues are impacted.

4. ***Marking or Lighting an Object in Accordance with the Standards for an Object of Greater Height or Size.*** The object may present such an extraordinary hazard potential that higher standards may be recommended for increased conspicuity to ensure the safety to air navigation.

c. ***Deviations***. The OES conducts an aeronautical study of the proposed deviation(s) and forwards its recommendation to FAA headquarters in Washington, DC, for final approval. Examples of deviations that may be considered:

1. Colors of objects.

2. Dimensions of color bands or rectangles.

3. Colors/types of lights.

4. Basic signals and intensity of lighting.

5. Night/day lighting combinations.

6. Flash rate.

d. The FAA strongly recommends that owners become familiar with the different types of lighting systems and to specifically request the type of lighting system desired when submitting FAA Form 7460-1. (This request should be noted in "item 2.D" of the FAA form.) Information on these systems can be found in Chapter 12, Table 4 of this AC. While the FAA will make every effort to accommodate the structure sponsor's request, sponsors should also request information from system manufacturers in order to determine which system best meets their needs based on purpose, installation, and maintenance costs.

6. ADDITIONAL NOTIFICATION

Sponsors are reminded that any change to the submitted information on which the FAA has based its determination, including modification, deviation or optional upgrade to white lighting on structures which are regulated by the FCC, must also be filed with the FCC prior to making the change for proper authorization and annotations of obstruction marking and lighting. These structures will be subject to inspection and enforcement of marking and lighting requirements by the FCC. FCC Forms and Bulletins can be obtained from the FCC's National Call Center at 1-888-CALL-FCC (1-888-225-5322). Upon completion of the actual change, notify the Aeronautical Charting office at:

NOAA/NOS
Aeronautical Charting Division
Station 5601, N/ACC113
1305 East-West Highway
Silver Spring, MD 20910-3233

7. METRIC UNITS

To promote an orderly transition to metric units, sponsors should include both English and metric (SI units) dimensions. The metric conversions may not be exact equivalents, however, until there is an official changeover to the metric system, the English dimensions will govern.

CHAPTER 2. GENERAL

20. STRUCTURES TO BE MARKED AND LIGHTED

Any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200 feet (61m) above ground level (AGL) or exceeds any obstruction standard contained in 14 CFR part 77, should normally be marked and/or lighted. However, an FAA aeronautical study may reveal that the absence of marking and/or lighting will not impair aviation safety. Conversely, the object may present such an extraordinary hazard potential that higher standards may be recommended for increased conspicuity to ensure safety to air navigation. Normally outside commercial lighting is not considered sufficient reason to omit recommended marking and/or lighting. Recommendations on marking and/or lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structures and overall layout of design. The FAA may also recommend marking and/or lighting a structure that does not exceed 200 (61m) feet AGL or 14 CFR part 77 standards because of its particular location.

21. GUYED STRUCTURES

The guys of a 2,000-foot (610m) skeletal tower are anchored from 1,600 feet (488m) to 2,000 feet (610m) from the base of the structure. This places a portion of the guys 1,500 feet (458m) from the tower at a height of between 125 feet (38m) to 500 feet (153m) AGL. 14 CFR part 91, section 119, requires pilots, when operating over other than congested areas, to remain at least 500 feet (153m) from man-made structures. Therefore, the tower must be cleared by 2,000 feet (610m) horizontally to avoid all guy wires. Properly maintained marking and lighting are important for increased conspicuity since the guys of a structure are difficult to see until aircraft are dangerously close.

22. MARKING AND LIGHTING EQUIPMENT

Considerable effort and research have been expended in determining the minimum marking and lighting systems or quality of materials that will produce an acceptable level of safety to air navigation. The FAA will recommend the use of only those marking and lighting systems that meet established technical standards. While additional lights may be desirable to identify an obstruction to air navigation and may, on occasion be recommended, the FAA will recommend minimum standards in the interest of safety, economy, and related concerns. Therefore, to provide an adequate level of safety, obstruction lighting systems should be installed, operated, and maintained in accordance with the recommended standards herein.

23. LIGHT FAILURE NOTIFICATION

a. Sponsors should keep in mind that conspicuity is achieved only when all recommended lights are working. Partial equipment outages decrease the margin of safety. Any outage should be corrected as soon as possible. Failure of a steady burning side or intermediate light should be corrected as soon as possible, but notification is not required.

b. Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to the appropriate flight service station (FSS) so a Notice to Airmen (NOTAM) can be issued. Toll-free numbers for FSS are listed in most telephone books or on the web at http://www.afss.com. This report should contain the following information:

1. Name of persons or organizations reporting light failures including any title, address, and telephone number.

2. The type of structure.

3. Location of structure (including latitude and longitude, if known, prominent structures, landmarks, etc.).

4. Height of structure above ground level (AGL)/above mean sea level (AMSL), if known.

5. A return to service date.

6. FCC Antenna Registration Number (for structures that are regulated by the FCC).

Note-

1. *When the primary lamp in a double obstruction light fails, and the secondary lamp comes on, no report is required. However, when one of the lamps in an incandescent L-864 flashing red beacon fails, it should be reported.*

2. *After 15 days, the NOTAM is automatically deleted from the system. The sponsor is responsible for calling the nearest FSS to extend the outage date or to report a return to service date.*

24. NOTIFICATION OF RESTORATION

As soon as normal operation is restored, notify the same FSS that received the notification of failure. The FCC advises that noncompliance with notification procedures could subject its sponsor to penalties or monetary forfeitures.

25. FCC REQUIREMENT

FCC licensees are required to file an environmental assessment with the Commission when seeking authorization for the use of the high intensity flashing white lighting system on structures located in residential neighborhoods, as defined by the applicable zoning law.

CHAPTER 3. MARKING GUIDLINES

30. PURPOSE

This chapter provides recommended guidelines to make certain structures conspicuous to pilots during daylight hours. One way of achieving this conspicuity is by painting and/or marking these structures. Recommendations on marking structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structures and overall layout of design.

31. PAINT COLORS

Alternate sections of aviation orange and white paint should be used as they provide maximum visibility of an obstruction by contrast in colors.

32. PAINT STANDARDS

The following standards should be followed. To be effective, the paint used should meet specific color requirements when freshly applied to a structure. Since all outdoor paints deteriorate with time and it is not practical to give a maintenance schedule for all climates, surfaces should be repainted when the color changes noticeably or its effectiveness is reduced by scaling, oxidation, chipping, or layers of contamination.

a. ***Materials and Application***. Quality paint and materials should be selected to provide extra years of service. The paint should be compatible with the surfaces to be painted, including any previous coatings, and suitable for the environmental conditions. Surface preparation and paint application should be in accordance with manufacturer's recommendations.

Note-
In-Service Aviation Orange Color Tolerance Charts are available from private suppliers for determining when repainting is required. The color should be sampled on the upper half of the structure, since weathering is greater there.

b. ***Surfaces Not Requiring Paint***. Ladders, decks, and walkways of steel towers and similar structures need not be painted if a smooth surface presents a potential hazard to maintenance personnel. Paint may also be omitted from precision or critical surfaces if it would have an adverse effect on the transmission or radiation characteristics of a signal. However, the overall marking effect of the structure should not be reduced.

c. ***Skeletal Structures***. Complete all marking/painting prior to or immediately upon completion of construction. This applies to catenary support structures, radio and television towers, and similar skeletal structures. To be effective, paint should be applied to all inner and outer surfaces of the framework.

33. PAINT PATTERNS

Paint patterns of various types are used to mark structures. The pattern to be used is determined by the size and shape of the structure. The following patterns are recommended.

a. ***Solid Pattern***. Obstacles should be colored aviation orange if the structure has both horizontal and vertical dimensions not exceeding 10.5 feet (3.2m).

b. ***Checkerboard Pattern***. Alternating rectangles of aviation orange and white are normally displayed on the following structures:

1. Water, gas, and grain storage tanks.

2. Buildings, as required.

3. Large structures exceeding 10.5 feet (3.2m) across having a horizontal dimension that is equal to or greater than the vertical dimension.

c. ***Size of Patterns***. Sides of the checkerboard pattern should measure not less than 5 feet (1.5m) or more than 20 feet (6m) and should be as nearly square as possible. However, if it is impractical because of the size or shape of a structure, the patterns may have sides less than 5 feet (1.5m). When possible, corner surfaces should be colored orange.

d. ***Alternate Bands***. Alternate bands of aviation orange and white are normally displayed on the following structures:

1. Communication towers and catenary support structures.

2. Poles.

3. Smokestacks.

4. Skeletal framework of storage tanks and similar structures.

5. Structures which appear narrow from a side view, that are 10.5 feet (3.2m) or more across and the horizontal dimension is less than the vertical dimension.

6. Coaxial cable, conduits, and other cables attached to the face of a tower.

e. ***Color Band Characteristics***. Bands for structures of any height should be:

1. Equal in width, provided each band is not less than $1^1/_2$ feet (0.5m) or more than 100 feet (31m) wide.

2. Perpendicular to the vertical axis with the bands at the top and bottom ends colored orange.

3. An odd number of bands on the structure.

4. Approximately one-seventh the height if the structure is 700 feet (214m) AGL or less. For each additional 200 feet (61m) or fraction thereof, add one (1) additional orange and one (1) additional white band.

5. Equal and in proportion to the structure's height AGL.

Structure Height to Bandwidth Ratio

Example: If a Structure is:		
Greater Than	**But Not More Than**	**Band Width**
10.5 feet (3.2m)	700 feet (214m)	$^1/_7$ of height
701 feet (214m)	900 feet (275m)	$^1/_9$ of height
901 feet (275m)	1,100 feet (336m)	$^1/_{11}$ of height
1,100 feet (336m)	1,300 feet (397m)	$^1/_{13}$ of height

TBL 1

f. ***Structures With a Cover or Roof***. If the structure has a cover or roof, the highest orange band should be continued to cover the entire top of the structure.

g. ***Skeletal Structures Atop Buildings***. If a flagpole, skeletal structure, or similar object is erected on top of a building, the combined height of the object and building will determine whether marking is recommended; however, only the height of the object under study determines the width of the color bands.

h. ***Partial Marking***. If marking is recommended for only a portion of a structure because of shielding by other objects or terrain, the width of the bands should be determined by the overall height of the structure. A minimum of three bands should be displayed on the upper portion of the structure.

i. ***Teardrop Pattern***. Spherical water storage tanks with a single circular standpipe support may be marked in a teardrop-striped pattern. The tank should show alternate stripes of aviation orange and white. The stripes should extend from the top center of the tank to its supporting standpipe. The width of the stripes should be equal, and the width of each stripe at the greatest girth of the tank should not be less than 5 feet (1.5m) nor more than 15 feet (4.6m).

j. ***Community Names***. If it is desirable to paint the name of the community on the side of a tank, the stripe pattern may be broken to serve this purpose. This open area should have a maximum height of 3 feet (0.9m).

k. ***Exceptions.*** Structural designs not conducive to standard markings may be marked as follows:

1. If it is not practical to color the roof of a structure in a checkerboard pattern, it may be colored solid orange.

2. If a spherical structure is not suitable for an exact checkerboard pattern, the shape of the rectangles may be modified to fit the shape of the surface.

3. Storage tanks not suitable for a checkerboard pattern may be colored by alternating bands of aviation orange and white or a limited checkerboard pattern applied to the upper one-third of the structure.

4. The skeletal framework of certain water, gas, and grain storage tanks may be excluded from the checkerboard pattern.

34. MARKERS

Markers are used to highlight structures when it is impractical to make them conspicuous by painting. Markers may also be used in addition to aviation orange and white paint when additional conspicuity is necessary for aviation safety. They should be displayed in conspicuous positions on or adjacent to the structures so as to retain the general definition of the structure. They should be recognizable in clear air from a distance of at least 4,000 feet (1219m) and in all directions from which aircraft are likely to approach. Markers should be distinctively shaped, i.e., spherical or cylindrical, so they are not mistaken for items that are used to convey other information. They should be replaced when faded or otherwise deteriorated.

a. ***Spherical Markers***. Spherical markers are used to identify overhead wires. Markers may be of another shape, i.e., cylindrical, provided the projected area of such markers will not be less than that presented by a spherical marker.

1. ***Size and Color***.

The diameter of the markers used on extensive catenary wires across canyons, lakes, rivers, etc., should be not less than 36 inches (91cm). Smaller 20-inch (51cm) spheres are permitted on less extensive power lines or on power lines below 50 feet (15m) above the ground and within 1,500 feet (458m) of an airport runway end. Each marker should be a solid color such as aviation orange, white, or yellow.

2. ***Installations.***

(a) ***Spacing.*** Markers should be spaced equally along the wire at intervals of approximately 200 feet (61m) or a fraction thereof. Intervals between markers should be less in critical areas near runway ends (i.e., 30 to 50 feet (10m to 15m)). They should be displayed on the highest wire or by another means at the same height as the highest wire. Where there is more than one wire at the highest point, the markers may be installed alternately along each wire if the distance between adjacent markers meets the spacing standard. This method allows the weight and wind loading factors to be distributed.

(b) ***Pattern***. An alternating color scheme provides the most conspicuity against all backgrounds. Mark overhead wires by alternating solid colored markers of aviation orange, white, and yellow. Normally, an orange sphere is placed at each end of a line and the spacing is adjusted (not to exceed 200 feet (61m)) to accommodate the rest of the markers. When less than four markers are used, they should all be aviation orange.

b. ***Flag Markers***. Flags are used to mark certain structures or objects when it is technically impractical to use spherical markers or painting. Some examples are temporary construction equipment, cranes, derricks, oil and other drilling rigs. Catenaries should use spherical markers.

1. ***Minimum Size***. Each side of the flag marker should be at least 2 feet (0.6m) in length.

2. ***Color Patterns***. Flags should be colored as follows:

(a) ***Solid***. Aviation orange.

(b) ***Orange and White***. Arrange two triangular sections, one aviation orange and the other white to form a rectangle.

(c) ***Checkerboard.*** **Flags** 3 feet (0.9m) or larger should be a checkerboard pattern of aviation orange and white squares, each 1 foot (0.3m) plus or minus 10 percent.

3. ***Shape***. Flags should be rectangular in shape and have stiffeners to keep them from drooping in calm wind.

4. ***Display***. Flag markers should be displayed around, on top, or along the highest edge of the obstruction. When flags are used to mark extensive or closely grouped obstructions, they should be displayed approximately 50 feet (15m) apart. The flag stakes should be of such strength and height that they will support the flags above all surrounding ground, structures, and/or objects of natural growth.

35. UNUSUAL COMPLEXITIES

The FAA may also recommend appropriate marking in an area where obstructions are so grouped as to present a common obstruction to air navigation.

36. OMISSION OR ALTERNATIVES TO MARKING

There are two alternatives to marking. Either alternative requires FAA review and concurrence.

a. ***High Intensity Flashing White Lighting Systems***. The high intensity lighting systems are more effective than aviation orange and white paint and therefore can be recommended instead of marking. This is particularly true under certain ambient light conditions involving the position of the sun relative to the direction of flight. When high intensity lighting systems are operated during daytime and twilight, other methods of marking may be omitted. When operated 24 hours a day, other methods of marking and lighting may be omitted.

b. ***Medium Intensity Flashing White Lighting Systems.*** When medium intensity lighting systems are operated during daytime and twilight on structures 500 feet (153m) AGL or less, other methods of marking may be omitted. When operated 24 hours a day on structures 500 feet (153m) AGL or less, other methods of marking and lighting may be omitted.

Note-
SPONSORS MUST ENSURE THAT ALTERNATIVES TO MARKING ARE COORDINATED WITH THE FCC FOR STRUCTURES UNDER ITS JURISDICTION PRIOR TO MAKING THE CHANGE.

CHAPTER 4. LIGHTING GUIDELINE

40. PURPOSE

This chapter describes the various obstruction lighting systems used to identify structures that an aeronautical study has determined will require added conspicuity. The lighting standards in this circular are the minimum necessary for aviation safety. Recommendations on lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structures and overall layout of design.

41. STANDARDS

The standards outlined in this AC are based on the use of light units that meet specified intensities, beam patterns, color, and flash rates as specified in AC 150/5345-43.

These standards may be obtained from:

Department of Transportation
OTS
Subsequent Distribution Office, M-30
Ardmore East Business Center
3341 Q 75th Avenue
Landover, MD 20785

42. LIGHTING SYSTEMS

Obstruction lighting may be displayed on structures as follows:

a. ***Aviation Red Obstruction Lights***. Use flashing beacons and/or steady burning lights during nighttime.

b. *Medium Intensity Flashing White Obstruction Lights.* Medium intensity flashing white obstruction lights may be used during daytime and twilight with automatically selected reduced intensity for nighttime operation. When this system is used on structures 500 feet (153m) AGL or less in height, other methods of marking and lighting the structure may be omitted. Aviation orange and white paint is always required for daytime marking on structures exceeding 500 feet (153m) AGL. This system is not normally recommended on structures 200 feet (61m) AGL or less.

c. ***High Intensity Flashing White Obstruction Lights***. Use high intensity flashing white obstruction lights during daytime with automatically selected reduced intensities for twilight and nighttime operations. When this system is used, other methods of marking and lighting the structure may be omitted.

This system should not be recommended on structures 500 feet (153m) AGL or less, unless an FAA aeronautical study shows otherwise.

Note-
All flashing lights on a structure should flash simultaneously except for catenary support structures, which have a distinct sequence flashing between levels.

d. ***Dual Lighting***. This system consists of red lights for nighttime and high or medium intensity flashing white lights for daytime and twilight. When a dual lighting system incorporates medium flashing intensity lights on structures 500 feet (153m) or less, or high intensity flashing white lights on structures of any height, other methods of marking the structure may be omitted.

e. ***Obstruction Lights During Construction***. As the height of the structure exceeds each level at which permanent obstruction lights would be recommended, two or more lights of the type specified in the determination should be installed at that level. Temporary high or medium intensity flashing white lights, as recommended in the determination, should be operated 24 hours a day until all permanent lights are in operation. In either case, two or more lights should be installed on the uppermost part of the structure any time it exceeds the height of the temporary construction equipment. They may be turned off for periods when they would interfere with construction personnel. If practical, permanent obstruction lights should be installed and operated at each level as construction progresses. The lights should be positioned to ensure that a pilot has an unobstructed view of at least one light at each level.

f. ***Obstruction Lights in Urban Areas***. When a structure is located in an urban area where there are numerous other white lights (e.g., streetlights, etc.) red obstruction lights with painting or a medium intensity dual system is recommended. Medium intensity lighting is not normally recommended on structures less than 200 feet (61m).

g. ***Temporary Construction Equipment Lighting***. Since there is such a variance in construction cranes, derricks, oil and other drilling rigs, each case should be considered individually. Lights should be installed according to the standards given in Chapters 5, 6, 7, or 8, as they would apply to permanent structures.

43. CATENARY LIGHTING

Lighted markers are available for increased night conspicuity of high-voltage (69KV or greater) transmission line catenary wires. These markers should be used on transmission line catenary wires near airports, heliports, across rivers, canyons, lakes, etc. The lighted markers should be manufacturer certified as recognizable from a minimum distance of 4,000 feet (1219m) under nighttime conditions, minimum visual flight rules (VFR) conditions or having a minimum intensity of at least 32.5 candela. The lighting unit should emit a steady burning red light. They should be used on the highest energized line. If the lighted markers are installed on a line other than the highest catenary, then markers specified in paragraph 34 should be used in addition to the lighted markers. (The maximum distance between the line energizing the lighted markers and the highest catenary above the lighted marker should be no more than 20 feet (6m).) Markers should be distinctively shaped, i.e., spherical, cylindrical, so they are not mistaken for items that are used to convey other information. They should be visible in all directions from which aircraft are likely to approach. The area in the immediate vicinity of the supporting structure's base should be clear of all items and/or objects of natural growth that could interfere with the line-of-sight between a pilot and the structure's lights. Where a catenary wire crossing requires three or more supporting structures, the inner structures should be equipped with enough light units per level to provide a full coverage.

44. INSPECTION, REPAIR AND MAINTENANCE

To ensure the proper candela output for fixtures with incandescent lamps, the voltage provided to the lamp filament should not vary more than plus or minus 3 percent of the rated voltage of the lamp. The input voltage should be measured at the lamp socket with the lamp operating during the hours of normal operation. (For strobes, the input voltage of the power supplies should be within 10 percent of rated voltage.) Lamps should be replaced after being operated for not more than 75 percent of their rated life or immediately upon failure. Flashtubes in a light unit should be replaced immediately upon failure, when the peak effective intensity falls below specification limits or when the fixture begins skipping flashes, or at the manufacturer's recommended intervals. Due to the effects of harsh environments, beacon lenses should be visually inspected for ultraviolet damage, cracks, crazing, dirt build up, etc., to insure that the certified light output has not deteriorated. (See paragraph 23, for reporting requirements in case of failure.)

45. NONSTANDARD LIGHTS

Moored balloons, chimneys, church steeples, and similar obstructions may be floodlighted by fixed search light projectors installed at three or more equidistant points around the base of each obstruction. The searchlight projectors should provide an average illumination of at least 15 foot-candles over the top one-third of the obstruction.

46. PLACEMENT FACTORS

The height of the structure AGL determines the number of light levels. The light levels may be adjusted slightly, but not to exceed 10 feet (3m), when necessary to accommodate guy wires and personnel who replace or repair light fixtures. Except for catenary support structures, the following factors should be considered when determining the placement of obstruction lights on a structure.

a. ***Red Obstruction Lighting Systems***. The overall height of the structure including all appurtenances such as rods, antennas, obstruction lights, etc., determines the number of light levels.

b. ***Medium Intensity Flashing White Obstruction Lighting Systems***. The overall height of the structure including all appurtenances such as rods, antennas, obstruction lights, etc., determines the number of light levels.

c. ***High Intensity Flashing White Obstruction Lighting Systems***. The overall height of the main structure including all appurtenances such as rods, antennas, obstruction lights, etc., determines the number of light levels.

d. ***Dual Obstruction Lighting Systems***. The overall height of the structure including all appurtenances such as rods, antennas, obstruction lights, etc., is used to determine the number of light levels for a medium intensity white obstruction light/red obstruction dual lighting system. The overall height of the structure including all appurtenances is used to determine the number of light levels for a high intensity white obstruction light/red obstruction dual lighting system.

e. ***Adjacent Structures***. The elevation of the tops of adjacent buildings in congested areas may be used as the equivalent of ground level to determine the proper number of light levels required.

f. ***Shielded Lights***. If an adjacent object shields any light, horizontal placement of the lights should be adjusted or additional lights should be mounted on that object to retain or contribute to the definition of the obstruction.

47. MONITORING OBSTRUCTION LIGHTS

Obstruction lighting systems should be closely monitored by visual or automatic means. It is extremely important to visually inspect obstruction lighting in all operating intensities at least once every 24 hours on systems without automatic monitoring. In the event a structure is not readily accessible for visual observation, a properly maintained automatic monitor should be used. This monitor should be designed to register the malfunction of any light on the obstruction regardless of its position or color. When using remote monitoring devices, the communication status and operational status of the system should be confirmed at least once every 24 hours. The monitor (aural or visual) should be located in an area generally occupied by responsible personnel. In some cases, this may require a remote monitor in an attended location. For each structure, a log should be maintained in which daily operations status of the lighting system is recorded. Beacon lenses should be replaced if serious cracks, crazing, dirt build up, etc., has occurred.

48. ICE SHIELDS

Where icing is likely to occur, metal grates or similar protective ice shields should be installed directly over each light unit to prevent falling ice or accumulations from damaging the light units.

49. DISTRACTION

a. Where obstruction lights may distract operators of vessels in the proximity of a navigable waterway, the sponsor must coordinate with the Commandant, U.S. Coast Guard, to avoid interference with marine navigation.

b. The address for marine information and coordination is:

Chief, Aids to Navigation
Division (OPN)
U.S. Coast Guard Headquarters
2100 2nd Street, SW., Rm. 3610
Washington, DC 20593-0001
Telephone: (202) 267-0980

CHAPTER 5. RED OBSTRUCTION LIGHT SYSTEM

50. PURPOSE

Red Obstruction lights are used to increase conspicuity during nighttime. Daytime and twilight marking is required. Recommendations on lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structutes and overall layout of design.

51. STANDARDS

The red obstruction lighting system is composed of flashing omnidirectional beacons (L-864) and/or steady burning (L-810) lights. When one or more levels is comprised of flashing beacon lighting, the lights should flash simultaneously.

a. ***Single Obstruction Light***. A single (L-810) light may be used when more than one obstruction light is required either vertically or horizontally or where maintenance can be accomplished within a reasonable time.

1. ***Top Level***. A single light may be used to identify low structures such as airport ILS buildings and long horizontal structures such as perimeter fences and building roof outlines.

2. ***Intermediate Level***. Single lights may be used on skeletal and solid structures when more than one level of lights is installed and there are two or more single lights per level.

b. ***Double Obstruction Light***. A double (L-810) light should be installed when used as a top light, at each end of a row of single obstruction lights, and in areas or locations where the failure of a single unit could cause an obstruction to be totally unlighted.

1. ***Top Level.*** **Structures** 150 feet (46m) AGL or less should have one or more double lights installed at the highest point and operating simultaneously.

2. ***Intermediate Level***. Double lights should be installed at intermediate levels when a malfunction of a single light could create an unsafe condition and in remote areas where maintenance cannot be performed within a reasonable time. Both units may operate simultaneously, or a transfer relay may be used to switch to a spare unit should the active system fail.

3. ***Lowest Level***. The lowest level of light units may be installed at a higher elevation than normal on a structure if the surrounding terrain, trees, or adjacent building(s) would obscure the lights. In certain instances, as determined by an FAA aeronautical study, the lowest level of lights may be eliminated.

52. CONTROL DEVICE

Red obstruction lights should be operated by a satisfactory control device (e.g., photo cell, timer, etc.) adjusted so the lights will be turned on when the northern sky illuminance reaching a vertical surface falls below a level of 60 foot-candles (645.8 lux) but before reaching a level of 35 foot-candles (367.7 lux). The control device should turn the lights off when the northern sky illuminance rises to a level of not more than 60 foot-candles (645.8 lux). The lights may also remain on continuously. The sensing device should, if practical, face the northern sky in the Northern Hemisphere. (See AC 150/5345-43.)

53. POLES, TOWERS, AND SIMILAR SKELETAL STRUCTURES

The following standards apply to radio and television towers, supporting structures for overhead transmission lines, and similar structures.

a. ***Top Mounted Obstruction Light.***

1. ***Structures 150 Feet (46m) AGL or Less***. Two or more steady burning (L-810) lights should be installed in a manner to ensure an unobstructed view of one or more lights by a pilot.

2. ***Structures Exceeding 150 Feet (46m) AGL***. At least one red flashing (L-864) beacon should be installed in a manner to ensure an unobstructed view of one or more lights by a pilot.

3. ***Appurtenances 40 Feet (12m) or Less***. If a rod, antenna, or other appurtenance 40 feet (12m) or less in height is incapable of supporting a red flashing beacon, then it may be placed at the base of the appurtenance. If the mounting location does not allow unobstructed viewing of the beacon by a pilot, then additional beacons should be added.

4. ***Appurtenances Exceeding 40 Feet (12m)***. If a rod, antenna, or other appurtenance exceeding 40 feet (12m) in height is incapable of supporting a red flashing beacon, a supporting mast with one or more beacons should be installed adjacent to the appurtenance. Adjacent installations should not exceed the height of the appurtenance and be within 40 feet (12m) of the tip to allow the pilot an unobstructed view of at least one beacon.

b. ***Mounting Intermediate Levels***. The number of light levels is determined by the height of the structure, including all appurtenances, and is detailed in Appendix 1. The number of lights on each level is

determined by the shape and height of the structure. These lights should be mounted so as to ensure an unobstructed view of at least one light by a pilot.

1. ***Steady Burning Lights (L-810).***

(a) ***Structures 350 Feet (107m) AGL or Less***. Two or more steady burning (L-810) lights should be installed on diagonally or diametrically opposite positions.

(b) ***Structures Exceeding 350 Feet (107m) AGL.*** Install steady burning (L-810) lights on each outside corner of each level.

2. ***Flashing Beacons (L-864).***

(a) ***Structures 350 Feet (107m) AGL or Less***. These structures do not require flashing (L-864) beacons at intermediate levels.

(b) ***Structure Exceeding 350 Feet (107m) AGL***. At intermediate levels, two beacons (L-864) should be mounted outside at diagonally opposite positions of intermediate levels.

54. CHIMNEYS, FLARE STACKS, AND SIMILAR SOLID STRUCTURES

a. *Number of Light Units.*

1. The number of units recommended depends on the diameter of the structure at the top. The number of lights recommended below are the minimum.

2. When the structure diameter is:

(a) *20 Feet (6m) or Less.* Three light units per level.

(b) *Exceeding 20 Feet (6m) But Not More Than 100 Feet (31m).* Four light units per level.

(c) *Exceeding 100 Feet (31m) But Not More Than 200 Feet (61m).* Six light units per level.

(d) *Exceeding 200 Feet (61m).* Eight light units per level.

b. ***Top Mounted Obstruction Lights***.

1. *Structures 150 Feet (46m) AGL or Less.* L-810 lights should be installed horizontally at regular intervals at or near the top.

2. *Structures Exceeding 150 Feet (46m) AGL.* At least three L-864 beacons should be installed.

3. *Chimneys, Cooling Towers, and Flare Stacks.* Lights may be displayed as low as 20 feet (6m) below the top to avoid the obscuring effect of deposits and heat generally emitted by this type of structure. It is important that these lights be readily accessible for cleaning and lamp replacement. It is understood that with flare stacks, as well as any other structures associated with the petrol-chemical industry, normal lighting requirements may not be necessary. This could be due to the location of the flare stack/structure within a large well-lighted petrol-chemical plant or the fact that the flare, or working lights surrounding the flare stack/structure, is as conspicuous as obstruction lights.

c. ***Mounting Intermediate Levels***. The number of light levels is determined by the height of the structure including all appurtenances. For cooling towers 600 feet (183m) or less, intermediate light levels are not necessary. Structures exceeding 600 feet (183m) AGL should have a second level of light units installed approximately at the midpoint of the structure and in a vertical line with the top level of lights.

1. ***Steady Burning (L-810) Lights***. The recommended number of light levels may be obtained from Appendix 1. At least three lights should be installed on each level.

2. ***Flashing (L-864) Beacons***. The recommended number of beacon levels may be obtained from Appendix 1. At least three lights should be installed on each level.

(a) *Structures 350 Feet (107m) AGL or Less.* These structures do not need intermediate levels of flashing beacons.

(b) *Structures Exceeding 350 Feet (107m) AGL.* At least three flashing (L-864) beacons should be installed on each level in a manner to allow an unobstructed view of at least one beacon.

55. GROUP OF OBSTRUCTIONS

When individual objects, except wind turbines, within a group of obstructions are not the same height and are spaced a maximum of 150 feet (46m) apart, the prominent objects within the group should be lighted in accordance with the standards for individual obstructions of a corresponding height. If the outer structure is shorter than the prominent, the outer structure should be lighted in accordance with the standards for individual obstructions of a corresponding height. Light units should be placed to ensure that the light is visible to a pilot approaching from **any** direction. In addition, at least one flashing beacon should be installed at the top of a prominent center obstruction or on a special tower located near the center of the group.

56. ALTERNATE METHOD OF DISPLAYING OBSTRUCTION LIGHTS

When recommended in an FAA aeronautical study, lights may be placed on poles equal to the height of the obstruction and installed on or adjacent to the structure instead of installing lights on the obstruction.

57. PROMINENT BUILDINGS, BRIDGES, AND SIMILAR EXTENSIVE OBSTRUCTIONS

When objects within a group of obstructions are approximately the same overall height above the surface and are located a maximum of 150 feet (46m) apart, the group of obstructions may be considered an extensive obstruction. Install light units on the same horizontal plane at the highest portion or edge of prominent obstructions. Light units should be placed to ensure that the light is visible to a pilot approaching from **any** direction. If the structure is a bridge and is over navigable water, the sponsor must obtain prior approval of the lighting installation from the Commander of the District Office of the United States Coast Guard to avoid interference with marine navigation. Steady burning lights should be displayed to indicate the extent of the obstruction as follows:

a. ***Structures 150 Feet (46m) or Less in Any Horizontal Direction***. If the structure/bridge/extensive obstruction is 150 feet (46m) or less horizontally, at least one steady burning light (L-810) should be displayed on the highest point at each end of the major axis of the obstruction. If this is impractical because of the overall shape, display a double obstruction light in the center of the highest point.

b. ***Structures Exceeding 150 Feet (46m) in at Least One Horizontal Direction***. If the structure/bridge/ extensive obstruction exceeds 150 feet (46m) horizontally, display at least one steady burning light for each 150 feet (46m), or fraction thereof, of the overall length of the major axis. At least one of these lights should be displayed on the highest point at each end of the obstruction. Additional lights should be displayed at approximately equal intervals not to exceed 150 feet (46m) on the highest points along the edge between the end lights. If an obstruction is located near a landing area and two or more edges are the same height, the edge nearest the landing area should be lighted.

c. ***Structures Exceeding 150 Feet (46m) AGL***. Steady burning red obstruction lights should be installed on the highest point at each end. At intermediate levels, steady burning red lights should be displayed for each 150 feet (46m) or fraction thereof. The vertical position of these lights should be equidistant between the top lights and the ground level as the shape and type of obstruction will permit. One such light should be displayed at each outside corner on each level with the remaining lights evenly spaced between the corner lights.

d. ***Exceptions***. Flashing red beacons (L-864) may be used instead of steady burning obstruction lights if early or special warning is necessary. These beacons should be displayed on the highest points of an extensive obstruction at intervals not exceeding 3,000 feet (915m). At least three beacons should be displayed on one side of the extensive obstruction to indicate a line of lights.

e. ***Ice Shields***. Where icing is likely to occur, metal grates or similar protective ice shields should be installed directly over each light unit to prevent falling ice or accumulations from damaging the light units. The light should be mounted in a manner to ensure an unobstructed view of at least one light by a pilot approaching from any direction.

CHAPTER 6. MEDIUM INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEMS

60. PURPOSE

Medium intensity flashing white (L-865) obstruction lights may provide conspicuity both day and night. Recommendations on lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structures and overall layout of design.

61. STANDARDS

The medium intensity flashing white light system is normally composed of flashing omnidirectional lights. Medium intensity flashing white obstruction lights may be used during daytime and twilight with automatically selected reduced intensity for nighttime operation. When this system is used on structures 500 feet (153m) AGL or less in height, other methods of marking and lighting the structure may be omitted. Aviation orange and white paint is always required for daytime marking on structures exceeding 500 feet (153m) AGL. This system is not normally recommended on structures 200 feet (61m) AGL or less.

The use of a 24-hour medium intensity flashing white light system in urban/populated areas in not normally recommended due to their tendency to merge with background lighting in these areas at night. This makes it extremely difficult for some types of aviation operations, i.e., med-evac, and police helicopters to see these structures. The use of this type of system in urban and rural areas often results in complaints. In addition, this system is not recommended on structures within 3 nautical miles of an airport.

62. RADIO AND TELEVISION TOWERS AND SIMILAR SKELETAL STRUCTURES

a. ***Mounting Lights***. The number of levels recommended depends on the height of the structure, including antennas and similar appurtenances.

1. ***Top Levels***. One or more lights should be installed at the highest point to provide 360-degree coverage ensuring an unobstructed view.

2. ***Appurtenances 40 feet (12m) or less***. If a rod, antenna, or other appurtenance 40 feet (12m) or less in height is incapable of supporting the medium intensity flashing white light, then it may be placed at the base of the appurtenance. If the mounting location does not allow unobstructed viewing of the medium intensity flashing white light by a pilot, then additional lights should be added.

3. ***Appurtenances Exceeding 40 feet (12m)***. If a rod, antenna, or other appurtenance exceeds 40 feet (12m) above the tip of the main structure, a medium intensity flashing white light should be placed within 40 feet (12m) from the top of the appurtenance. If the appurtenance (such as a whip antenna) is incapable of supporting the light, one or more lights should be mounted on a pole adjacent to the appurtenance. Adjacent installations should not exceed the height of the appurtenance and be within 40 feet (12m) of the tip to allow the pilot an unobstructed view of at least one light.

b. ***Intermediate Levels***. At intermediate levels, two beacons (L-865) should be mounted outside at diagonally or diametrically opposite positions of intermediate levels. The lowest light level should not be less than 200 feet (61m) AGL.

c. ***Lowest Levels***. The lowest level of light units may be installed at a higher elevation than normal on a structure if the surrounding terrain, trees, or adjacent building(s) would obscure the lights. In certain instances, as determined by an FAA aeronautical study, the lowest level of lights may be eliminated.

d. ***Structures 500 Feet (153m) AGL or Less***. When white lights are used during nighttime and twilight only, marking is required for daytime. When operated 24 hours a day, other methods of marking and lighting are not required.

e. ***Structures Exceeding 500 Feet (153m) AGL***. The lights should be used during nighttime and twilight and may be used 24 hours a day. Marking is always required for daytime.

f. ***Ice Shields***. Where icing is likely to occur, metal grates or similar protective ice shields should be installed directly over each light unit to prevent falling ice or accumulations from damaging the light units. The light should be mounted in a manner to ensure an unobstructed view of at least one light by a pilot approaching from any direction.

63. CONTROL DEVICE

The light intensity is controlled by a device that changes the intensity when the ambient light changes. The system should automatically change intensity steps when the northern sky illumination in the Northern Hemisphere on a vertical surface is as follows:

a. ***Twilight-to-Night***. This should not occur before the illumination drops below five foot-candles (53.8

lux) but should occur before it drops below two foot-candles (21.5 lux).

b. ***Night-to-Day***. The intensity changes listed in subparagraph 63a above should be reversed when changing from the night to day mode.

64. CHIMNEYS, FLARE STACKS, AND SIMILAR SOLID STRUCTURES

a. ***Number of Light Units***. The number of units recommended depends on the diameter of the structure at the top. Normally, the top level is on the highest point of a structure. However, the top level of chimney lights may be installed as low as 20 feet (6m) below the top to minimize deposit build-up due to emissions. The number of lights recommended are the minimum. When the structure diameter is:

1. *20 Feet (6m) or Less.* Three light units per level.

2. *Exceeding 20 Feet (6m) But Not More Than 100 Feet (31m).* Four light units per level.

3. *Exceeding 100 Feet (31m) But Not More Than 200 Feet (61m).* Six light units per level.

4. *Exceeding 200 Feet (61m).* Eight light units per level.

65. GROUP OF OBSTRUCTIONS

When individual objects within a group of obstructions are not the same height and are spaced a maximum of 150 feet (46m) apart, the prominent objects within the group should be lighted in accordance with the standards for individual obstructions of a corresponding height. If the outer structure is shorter than the prominent, the outer structure should be lighted in accordance with the standards for individual obstructions of a corresponding height. Light units should be placed to ensure that the light is visible to a pilot approaching from **any** direction. In addition, at least one medium intensity flashing white light should be installed at the top of a prominent center obstruction or on a special tower located near the center of the group.

66. SPECIAL CASES

Where lighting systems are installed on structures located near highways, waterways, airport approach areas, etc., caution should be exercised to ensure that the lights do not distract or otherwise cause a hazard to motorists, vessel operators, or pilots on an approach to an airport. In these cases, shielding may be necessary. This shielding should not derogate the intended purpose of the lighting system.

67. PROMINENT BUILDINGS AND SIMILAR EXTENSIVE OBSTRUCTIONS

When objects within a group of obstructions are approximately the same overall height above the surface and are located a maximum of 150 feet (46m) apart, the group of obstructions may be considered an extensive obstruction. Install light units on the same horizontal plane at the highest portion or edge of prominent obstructions. Light units should be placed to ensure that the light is visible to a pilot approaching from **any** direction. Lights should be displayed to indicate the extent of the obstruction as follows:

a. ***Structures 150 Feet (46m) or Less in Any Horizontal Direction.*** If the structure/extensive obstruction is 150 feet (46m) or less horizontally, at least one light should be displayed on the highest point at each end of the major axis of the obstruction. If this is impractical because of the overall shape, display a double obstruction light in the center of the highest point.

b. ***Structures Exceeding 150 Feet (46m) in at Least One Horizontal Direction***. If the structure/extensive obstruction exceeds 150 feet (46m) horizontally, display at least one light for each 150 feet (46m) or fraction thereof, of the overall length of the major axis. At least one of these lights should be displayed on the highest point at each end of the obstruction. Additional lights should be displayed at approximately equal intervals not to exceed 150 feet (46m) on the highest points along the edge between the end lights. If an obstruction is located near a landing area and two or more edges are the same height, the edge nearest the landing area should be lighted.

c. ***Structures Exceeding 150 Feet (46m) AGL***. Lights should be installed on the highest point at each end. At intermediate levels, lights should be displayed for each 150 feet (46m), or fraction thereof. The vertical position of these lights should be equidistant between the top lights and the ground level as the shape and type of obstruction will permit. One such light should be displayed at each outside corner on each level with the remaining lights evenly spaced between the corner lights.

CHAPTER 7. HIGH INTENSITY FLASHING WHITE OBSTRUCTION LIGHT SYSTEMS

70. PURPOSE

Lighting with high intensity (L-856) flashing white obstruction lights provides the highest degree of conspicuity both day and night. Recommendations on lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structutes and overall layout of design.

71. STANDARDS

Use high intensity flashing white obstruction lights during daytime with automatically selected reduced intensities for twilight and nighttime operations. When high intensity white lights are operated 24 hours a day, other methods of marking and lighting may be omitted. This system should not be recommended on structures 500 feet (153m) AGL or less unless an FAA aeronautical study shows otherwise.

72. CONTROL DEVICE

Light intensity is controlled by a device that changes the intensity when the ambient light changes. The use of a 24-hour high intensity flashing white light system in urban/populated areas is not normally recommended due to their tendency to merge with background lighting in these areas at night. This makes it extremely difficult for some types of aviation operations, i.e., med-evac, and police helicopters to see these structures. The use of this type of system in urban and rural areas often results in complaints.

The system should automatically change intensity steps when the northern sky illumination in the Northern Hemisphere on a vertical surface is as follows:

a. ***Day-to-Twilight***. This should not occur before the illumination drops to 60 foot-candles (645.8 lux), but should occur before it drops below 35 foot-candles (376.7 lux). The illuminance-sensing device should, if practical, face the northern sky in the Northern Hemisphere.

b. ***Twilight-to-Night***. This should not occur before the illumination drops below five foot-candles (53.8 lux), but should occur before it drops below two foot-candles (21.5 lux).

c. ***Night-to-Day***. The intensity changes listed in subparagraph 72 a and b above should be reversed when changing from the night to day mode.

73. UNITS PER LEVEL

One or more light units is needed to obtain the desired horizontal coverage. The number of light units recommended per level (except for the supporting structures of catenary wires and buildings) depends upon the average outside diameter of the specific structure, and the horizontal beam width of the light fixture. The light units should be installed in a manner to ensure an unobstructed view of the system by a pilot approaching from any direction. The number of lights recommended are the minimum. When the structure diameter is:

a. *20 Feet (6m) or Less.* Three light units per level.

b. *Exceeding 20 Feet (6m) But Not More Than 100 Feet (31m).* Four light units per level.

c. *Exceeding 100 Feet (31m).* Six light units per level.

74. INSTALLATION GUIDANCE

Manufacturing specifications provide for the effective peak intensity of the light beam to be adjustable from zero to 8 degrees above the horizon. Normal installation should place the top light at zero degrees to the horizontal and all other light units installed in accordance with Table 2:

Light Unit Elevation Above the Horizontal

Height of Light Unit Above Terrain	Degrees of Elevation Above the Horizontal
Exceeding 500 feet AGL	0
401 feet to 500 feet AGL	1
301 feet to 400 feet AGL	2
300 feet AGL or less	3

TBL 2

a. ***Vertical Aiming***. Where terrain, nearby residential areas, or other situations dictate, the light beam may be further elevated above the horizontal. The main beam of light at the lowest level should not strike the ground closer than 3 statute miles (5km) from the structure. If additional adjustments are necessary, the lights may be individually adjusted upward, in 1-degree increments, starting at the bottom. Excessive elevation may reduce its conspicuity by raising the beam above a collision course flight path.

b. ***Special Cases***. Where lighting systems are installed on structures located near highways, waterways, airport approach areas, etc., caution should be exercised to ensure that the lights do not distract or otherwise cause a hazard to motorists, vessel operators, or pilots on an approach to an airport. In these cases,

shielding or an adjustment to the vertical or horizontal light aiming may be necessary. This adjustment should not derogate the intended purpose of the lighting system. Such adjustments may require review action as described in Chapter 1, paragraph 5.

c. ***Relocation or Omission of Light Units***. Light units should not be installed in such a manner that the light pattern/output is disrupted by the structure.

1. ***Lowest Level***. The lowest level of light units may be installed at a higher elevation than normal on a structure if the surrounding terrain, trees, or adjacent building(s) would obscure the lights. In certain instances, as determined by an FAA aeronautical study, the lowest level of lights may be eliminated.

2. ***Two Adjacent Structures***. Where two structures are situated within 500 feet (153m) of each other and the light units are installed at the same levels, the sides of the structures facing each other need not be lighted. However, all lights on both structures must flash simultaneously, except for adjacent catenary support structures. Adjust vertical placement of the lights to either or both structures' intermediate levels to place the lights on the same horizontal plane. Where one structure is higher than the other, complete level(s) of lights should be installed on that part of the higher structure that extends above the top of the lower structure. If the structures are of such heights that the levels of lights cannot be placed in identical horizontal planes, then the light units should be placed such that the center of the horizontal beam patterns do not face toward the adjacent structure. For example, structures situated north and south of each other should have the light units on both structures installed on a northwest/southeast and northeast/southwest orientation.

3. ***Three or More Adjacent Structures***. The treatment of a cluster of structures as an individual or a complex of structures will be determined by the FAA as the result of an aeronautical study, taking into consideration the location, heights, and spacing with other structures.

75. ANTENNA OR SIMILAR APPURTENANCE LIGHT

When a structure lighted by a high intensity flashing light system is topped with an antenna or similar appurtenance exceeding 40 feet (12m) in height, a medium intensity flashing white light (L-865) should be placed within 40 feet (12m) from the tip of the appurtenance. This light should operate 24 hours a day and flash simultaneously with the rest of the lighting system.

76. CHIMNEYS, FLARE STACKS, AND SIMILAR SOLID STRUCTURES

The number of light levels depends on the height of the structure excluding appurtenances. Three or more lights should be installed on each level in such a manner to ensure an unobstructed view by the pilot. Normally, the top level is on the highest point of a structure. However, the top level of chimney lights may be installed as low as 20 feet (6m) below the top to minimize deposit build-up due to emissions.

77. RADIO AND TELEVISION TOWERS AND SIMILAR SKELETAL STRUCTURES

a. ***Mounting Lights***. The number of levels recommended depends on the height of the structure, including antennas and similar appurtenances. At least three lights should be installed on each level and mounted to ensure that the effective intensity of the full horizontal beam coverage is not impaired by the structural members.

b. ***Top Level***. One level of lights should be installed at the highest point of the structure. If the highest point is a rod or antenna incapable of supporting a lighting system, then the top level of lights should be installed at the highest portion of the main skeletal structure. When guy wires come together at the top, it may be necessary to install this level of lights as low as 10 feet (3m) below the top. If the rod or antenna exceeds 40 feet (12m) above the main structure, a medium intensity flashing white light (L-865) should be mounted on the highest point. If the appurtenance (such as a whip antenna) is incapable of supporting a medium intensity light, one or more lights should be installed on a pole adjacent to the appurtenance. Adjacent installation should not exceed the height of the appurtenance and be within 40 feet (12m) of the top to allow an unobstructed view of at least one light.

c. ***Ice Shields***. Where icing is likely to occur, metal grates or similar protective ice shields should be installed directly over each light unit to prevent falling ice or accumulations from damaging the light units.

78. HYPERBOLIC COOLING TOWERS

Light units should be installed in a manner to ensure an unobstructed view of at least two lights by a pilot approaching from **any** direction.

a. ***Number of Light Units***. The number of units recommended depends on the diameter of the structure

at the top. The number of lights recommended in the following table are the minimum. When the structure diameter is:

1. *20 Feet (6m) or Less.* Three light units per level.

2. *Exceeding 20 Feet (6m) But Not More Than 100 Feet (31m).* Four light units per level.

3. *Exceeding 100 Feet (31m) But Not More Than 200 Feet (61m).* Six light units per level.

4. *Exceeding 200 Feet (61m).* Eight light units per level.

b. ***Structures Exceeding 600 Feet (183m) AGL***. Structures exceeding 600 feet (183m) AGL should have a second level of light units installed approximately at the midpoint of the structure and in a vertical line with the top level of lights.

79. PROMINENT BUILDINGS AND SIMILAR EXTENSIVE OBSTRUCTIONS

When objects within a group of obstructions are approximately the same overall height above the surface and are located not more than 150 feet (46m) apart, the group of obstructions may be considered an extensive obstruction. Install light units on the same horizontal plane at the highest portion or edge of prominent obstructions. Light units should be placed to ensure that the light is visible to a pilot approaching from **any** direction. These lights may require shielding, such as louvers, to ensure minimum adverse impact on local communities. Extreme caution in the use of high intensity flashing white lights should be exercised.

a. ***If the Obstruction is 200 feet (61m) or Less in Either Horizontal*** *Dimension*, install three or more light units at the highest portion of the structure in a manner to ensure that at least one light is visible to a pilot approaching from **any** direction. Units may be mounted on a single pedestal at or near the center of the obstruction. If light units are placed more than 10 feet (3m) from the center point of the structure, use a minimum of four units.

b. ***If the Obstruction Exceeds 200 Feet (61m) in One Horizontal Dimension***, but is 200 feet (61m) or less in the other, two light units should be placed on each of the shorter sides. These light units may either be installed adjacent to each other at the midpoint of the edge of the obstruction or at (near) each corner with the light unit aimed to provide 180 degrees of coverage at each edge. One or more light units should be installed along the overall length of the major axis. These lights should be installed at approximately equal intervals not to exceed a distance of 100 feet (31m) from the corners or from each other.

c. ***If the Obstruction Exceeds 200 Feet (61m) in Both Horizontal Dimensions***, light units should be equally spaced along the overall perimeter of the obstruction at intervals of 100 feet (31m) or fraction thereof.

CHAPTER 8. DUAL LIGHTING WITH RED/MEDIUM INTENSITY FLASHING WHITE SYSTEMS

80. PURPOSE

This dual lighting system includes red lights (L-864) for nighttime and medium intensity flashing white lights (L-865) for daytime and twilight use. This lighting system may be used in lieu of operating a medium intensity flashing white lighting system at night. There may be some populated areas where the use of medium intensity at night may cause significant environmental concerns. The use of the dual lighting system should reduce/mitigate those concerns. Recommendations on lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structutes and overall layout of design.

81. INSTALLATION

The light units should be installed as specified in the appropriate portions of Chapters 4, 5, and 6. The number of light levels needed may be obtained from Appendix 1.

82. OPERATION

Lighting systems should be operated as specified in Chapter 3. Both systems should not be operated at the same time; however, there should be no more than a 2-second delay when changing from one system to the other. Outage of one of two lamps in the uppermost red beacon (L-864 incandescent unit) or outage of any uppermost red light shall cause the white obstruction light system to operate in its specified ”night” step intensity.

83. CONTROL DEVICE

The light system is controlled by a device that changes the system when the ambient light changes. The system should automatically change steps when

the northern sky illumination in the Northern Hemisphere on a vertical surface is as follows:

a. ***Twilight-to-Night***. This should not occur before the illumination drops below 5 foot-candles (53.8 lux) but should occur before it drops below 2 foot-candles (21.5 lux).

b. ***Night-to-Day***. The intensity changes listed in subparagraph 83 a above should be reversed when changing from the night to day mode.

84. ANTENNA OR SIMILAR APPURTENANCE LIGHT

When a structure utilizing this dual lighting system is topped with an antenna or similar appurtenance exceeding 40 feet (12m) in height, a medium intensity flashing white (L-865) and a red flashing beacon (L-864) should be placed within 40 feet (12m) from the tip of the appurtenance. The white light should operate during daytime and twilight and the red light during nighttime. These lights should flash simultaneously with the rest of the lighting system.

85. OMISSION OF MARKING

When medium intensity white lights are operated on structures 500 feet (153m) AGL or less during daytime and twilight, other methods of marking may be omitted.

CHAPTER 9. DUAL LIGHTING WITH RED/HIGH INTENSITY FLASHING WHITE SYSTEMS

90. PURPOSE

This dual lighting system includes red lights (L-864) for nighttime and high intensity flashing white lights (L-856) for daytime and twilight use. This lighting system may be used in lieu of operating a flashing white lighting system at night. There may be some populated areas where the use of high intensity lights at night may cause significant environmental concerns and complaints. The use of the dual lighting system should reduce/mitigate those concerns. Recommendations on lighting structures can vary depending on terrain features, weather patterns, geographic location, and in the case of wind turbines, number of structutes and overall layout of design.

91. INSTALLATION

The light units should be installed as specified in the appropriate portions of Chapters 4, 5, and 7. The number of light levels needed may be obtained from Appendix 1.

92. OPERATION

Lighting systems should be operated as specified in Chapters 4, 5, and 7. Both systems should not be operated at the same time; however, there should be no more than a 2-second delay when changing from one system to the other. Outage of one of two lamps in the uppermost red beacon (L-864 incandescent unit) or outage of any uppermost red light shall cause the white obstruction light system to operate in its specified “night” step intensity.

93. CONTROL DEVICE

The light intensity is controlled by a device that changes the intensity when the ambient light changes. The system should automatically change intensity steps when the northern sky illumination in the Northern Hemisphere on a vertical surface is as follows:

a. ***Day-to-Twilight***. This should not occur before the illumination drops to 60 foot-candles (645.8 lux) but should occur before it drops below 35 foot-candles (376.7 lux). The illuminance-sensing device should, if practical, face the northern sky in the Northern Hemisphere.

b. ***Twilight-to-Night***. This should not occur before the illumination drops below 5 foot-candles (53.8 lux) but should occur before it drops below 2 foot-candles (21.5 lux).

c. ***Night-to-Day***. The intensity changes listed in subparagraph 93 a and b above should be reversed when changing from the night to day mode.

94. ANTENNA OR SIMILAR APPURTENANCE LIGHT

When a structure utilizing this dual lighting system is topped with an antenna or similar appurtenance exceeding 40 feet (12m) in height, a medium intensity flashing white light (L-865) and a red flashing beacon (L-864) should be placed within 40 feet (12m) from the tip of the appurtenance. The white light should operate during daytime and twilight and the red light during nighttime.

95. OMISSION OF MARKING

When high intensity white lights are operated during daytime and twilight, other methods of marking may be omitted.

CHAPTER 10. MARKING AND LIGHTING OF CATENARY AND CATENARY SUPPORT STRUCTURES

100. PURPOSE

This chapter provides guidelines for marking and lighting catenary and catenary support structures. The recommended marking and lighting of these structures is intended to provide day and night conspicuity and to assist pilots in identifying and avoiding catenary wires and associated support structures.

101. CATENARY MARKING STANDARDS

Lighted markers are available for increased night conspicuity of high-voltage (69KV or greater) transmission line catenary wires. These markers should be used on transmission line catenary wires near airports, heliports, across rivers, canyons, lakes, etc. The lighted markers should be manufacturer certified as recognizable from a minimum distance of 4,000 feet (1219m) under nighttime conditions, minimum VFR conditions or having a minimum intensity of at least 32.5 candela. The lighting unit should emit a steady burning red light. They should be used on the highest energized line. If the lighted markers are installed on a line other than the highest catenary, then markers specified in paragraph 34 should be used in addition to the lighted markers. (The maximum distance between the line energizing the lighted markers and the highest catenary above the lighted marker should be no more than 20 feet (6m).) Markers should be distinctively shaped, i.e., spherical, cylindrical, so they are not mistaken for items that are used to convey other information. They should be visible in all directions from which aircraft are likely to approach. The area in the immediate vicinity of the supporting structure's base should be clear of all items and/or objects of natural growth that could interfere with the line-of-sight between a pilot and the structure's lights. Where a catenary wire crossing requires three or more supporting structures, the inner structures should be equipped with enough light units per level to provide a full coverage.

a. ***Size and Color***. The diameter of the markers used on extensive catenary wires across canyons, lakes, rivers, etc., should be not less than 36 inches (91cm). Smaller 20-inch (51cm) markers are permitted on less extensive power lines or on power lines below 50 feet (15m) above the ground and within 1,500 feet (458m) of an airport runway end. Each marker should be a solid color such as aviation orange, white, or yellow.

b. ***Installation.***

1. ***Spacing.*** Lighted markers should be spaced equally along the wire at intervals of approximately 200 feet (61m) or a fraction thereof. Intervals between markers should be less in critical areas near runway ends, i.e., 30 to 50 feet (10m to 15m). If the markers are installed on a line other than the highest catenary, then markers specified in paragraph 34 should be used in addition to the lighted markers. The maximum distance between the line energizing the lighted markers and the highest catenary above the markers can be no more than 20 feet (6m). The lighted markers may be installed alternately along each wire if the distance between adjacent markers meets the spacing standard. This method allows the weight and wind loading factors to be distributed.

2. ***Pattern***. An alternating color scheme provides the most conspicuity against all backgrounds. Mark overhead wires by alternating solid colored markers of aviation orange, white, and yellow. Normally, an orange marker is placed at each end of a line and the spacing is adjusted (not to exceed 200 feet (61m)) to accommodate the rest of the markers. When less than four markers are used, they should all be aviation orange.

102. CATENARY LIGHTING STANDARDS

When using medium intensity flashing white (L-866), high intensity flashing white (L-857), dual medium intensity (L-866/L-885) or dual high intensity (L-857/885) lighting systems, operated 24 hours a day, other marking of the support structure is not necessary.

a. ***Levels***. A system of three levels of sequentially flashing light units should be installed on each supporting structure or adjacent terrain. Install one level at the top of the structure, one at the height of the lowest point in the catenary and one level approximately midway between the other two light levels. The middle level should normally be at least 50 feet (15m) from the other two levels. The middle light unit may be deleted when the distance between the top and the bottom light levels is less than 100 feet (30m).

1. ***Top Levels***. One or more lights should be installed at the top of the structure to provide 360-degree coverage ensuring an unobstructed view. If the installation presents a potential danger to maintenance personnel, or when necessary for lightning protection, the top level of lights may be mounted as low as 20 feet (6m) below the highest point of the structure.

2. ***Horizontal Coverage***. The light units at the middle level and bottom level should be installed so as to provide a minimum of 180-degree coverage centered perpendicular to the flyway. Where a catenary crossing is situated near a bend in a river, canyon, etc., or is not perpendicular to the flyway, the

horizontal beam should be directed to provide the most effective light coverage to warn pilots approaching from either direction of the catenary wires.

3. ***Variation.*** The vertical and horizontal arrangements of the lights may be subject to the structural limits of the towers and/or adjacent terrain. A tolerance of 20 percent from uniform spacing of the bottom and middle light is allowed. If the base of the supporting structure(s) is higher than the lowest point in the catenary, such as a canyon crossing, one or more lights should be installed on the adjacent terrain at the level of the lowest point in the span. These lights should be installed on the structure or terrain at the height of the lowest point in the catenary.

b. ***Flash Sequence***. The flash sequence should be middle, top, and bottom with all lights on the same level flashing simultaneously. The time delay between flashes of levels is designed to present a unique system display. The time delay between the start of each level of flash duration is outlined in FAA AC 150/5345-43, Specification for Obstruction Lighting Equipment.

c. ***Synchronization***. Although desirable, the corresponding light levels on associated supporting towers of a catenary crossing need not flash simultaneously.

d. ***Structures 500 feet (153m) AGL or Less***. When medium intensity white lights (L-866) are operated 24 hours a day, or when a dual red/medium intensity system (L-866 daytime & twilight/L-885 nighttime) is used, marking can be omitted. When using a medium intensity while light (L-866) or a flashing red light (L-885) during twilight or nighttime only, painting should be used for daytime marking.

e. *Structures Exceeding 500 Feet (153m) AGL*. When high intensity white lights (L-857) are operated 24 hours a day, or when a dual red/high intensity system (L-857 daytime and twilight/L-885 nighttime) is used, marking can be omitted. This system should not be recommended on structures 500 feet (153m) or less unless an FAA aeronautical study shows otherwise. When a flashing red obstruction light (L-885), a medium intensity (L-866) flashing white lighting system or a high intensity white lighting system (L-857) is used for nighttime and twilight only, painting should be used for daytime marking.

103. CONTROL DEVICE

The light intensity is controlled by a device (photocell) that changes the intensity when the ambient light changes. The lighting system should automatically change intensity steps when the northern sky illumination in the Northern Hemisphere on a vertical surface is as follows:

a. ***Day-to-Twilight (L-857 System)***. This should not occur before the illumination drops to 60 foot-candles (645.8 lux), but should occur before it drops below 35 foot-candles (376.7 lux). The illuminant-sensing device should, if practical, face the northern sky in the Northern Hemisphere.

b. ***Twilight-to-Night (L-857 System).*** This should not occur before the illumination drops below 5 foot-candles (53.8 lux), but should occur before it drops below 2 foot-candles (21.5 lux).

c. ***Night-to-Day***. The intensity changes listed in subparagraph 103 a. and b. above should be reversed when changing from the night to day mode.

d. ***Day-to-Night (L-866 or L-885/L-866).*** This should not occur before the illumination drops below 5 foot-candles (563.8 lux) but should occur before it drops below 2 foot-candles (21.5 lux).

e. ***Night-to-Day***. The intensity changes listed in subparagraph d. above should be reversed when changing from the night to day mode.

f. ***Red Obstruction (L-885).*** The red lights should not turn on until the illumination drops below 60 foot-candles (645.8 lux) but should occur before reaching a level of 35 foot-candles (367.7 lux). Lights should not turn off before the illuminance rises above 35 foot-candles (367.7 lux), but should occur before reaching 60 foot-candles (645.8 lux).

104. AREA SURROUNDING CATENARY SUPPORT STRUCTURES

The area in the immediate vicinity of the supporting structure's base should be clear of all items and/or objects of natural growth that could interfere with the line-of-sight between a pilot and the structure's lights.

105. THREE OR MORE CATENARY SUPPORT STRUCTURES

Where a catenary wire crossing requires three or more supporting structures, the inner structures should be equipped with enough light units per level to provide a full 360-degree coverage.

CHAPTER 11. MARKING AND LIGHTING MOORED BALLOONS AND KITES

110. PURPOSE

The purpose of marking and lighting moored balloons, kites, and their cables or mooring lines is to indicate the presence and general definition of these objects to pilots when converging from any normal angle of approach.

111. STANDARDS

These marking and lighting standards pertain to all moored balloons and kites that require marking and lighting under 14 CFR, part 101.

112. MARKING

Flag markers should be used on mooring lines to warn pilots of their presence during daylight hours.

a. ***Display.*** Markers should be displayed at no more than 50-foot (15m) intervals and should be visible for at least 1 statute mile.

b. ***Shape.*** Markers should be rectangular in shape and not less than 2 feet (0.6m) on a side. Stiffeners should be used in the borders so as to expose a large area, prevent drooping in calm wind, or wrapping around the cable.

c. ***Color Patterns***. One of the following color patterns should be used:

1. ***Solid Color***. Aviation orange.

2. ***Orange and White.*** Two triangular sections, one of aviation orange and the other white, combined to form a rectangle.

113. PURPOSE

Flashing obstruction lights should be used on moored balloons or kites and their mooring lines to warn pilots of their presence during the hours between sunset and sunrise and during periods of reduced visibility. These lights may be operated 24 hours a day.

a. ***Systems***. Flashing red (L-864) or white beacons (L-865) may be used to light moored balloons or kites. High intensity lights (L-856) are not recommended.

b. ***Display***. Flashing lights should be displayed on the top, nose section, tail section, and on the tether cable approximately 15 feet (4.6m) below the craft so as to define the extremes of size and shape. Additional lights should be equally spaced along the cable's overall length for each 350 feet (107m) or fraction thereof.

c. ***Exceptions.*** When the requirements of this paragraph cannot be met, floodlighting may be used.

114. OPERATIONAL CHARACTERISTICS

The light intensity is controlled by a device that changes the intensity when the ambient light changes. The system should automatically turn the lights on and change intensities as ambient light condition change. The reverse order should apply in changing from nighttime to daytime operation. The lights should flash simultaneously.

CHAPTER 12. MARKING AND LIGHTING EQUIPMENT AND INFORMATION

120. PURPOSE

This chapter lists documents relating to obstruction marking and lighting systems and where they may be obtained.

121. PAINT STANDARD

Paint and aviation colors/gloss, referred to in this publication should conform to Federal Standard FED-STD-595. Approved colors shall be formulated without the use of Lead, Zinc Chromate or other heavy metals to match International Orange, White and Yellow. All coatings shall be manufactured and labeled to meet Federal Environmental Protection Act Volatile Organic Compound(s) guidelines, including the National Volatile Organic Compound Emission Standards for architectural coatings.

a. **Exterior Acrylic Waterborne Paint.** Coating should be a ready mixed, 100% acrylic, exterior latex formulated for application directly to galvanized surfaces. Ferrous iron and steel or non-galvanized surfaces shall be primed with a manufacturer recommended primer compatible with the finish coat.

b. **Exterior Solventborne Alkyd Based Paint**. Coating should be ready mixed, alkyd-based, exterior enamel for application directly to non-galvanized surfaces such as ferrous iron and steel. Galvanized surfaces shall be primed with a manufacturer primer compatible with the finish coat.

Paint Standards Color Table

COLOR	NUMBER
Orange	12197
White	17875
Yellow	13538

TBL 3

Note-
1. Federal specification T1-P-59, aviation surface paint, ready mixed international orange.

2. Federal specification T1-102, aviation surface paint, oil titanium zinc.

3. Federal specification T1-102, aviation surface paint, oil, exterior, ready mixed, white and light tints.

122. AVAILABILITY OF SPECIFICATIONS

Federal specifications describing the technical characteristics of various paints and their application techniques may be obtained from:

GSA- Specification Branch
470 L'Enfant Plaza
Suite 8214
Washington, DC 20407
Telephone: (202) 619-8925

123. LIGHTS AND ASSOCIATED EQUIPMENT

The lighting equipment referred to in this publication should conform to the latest edition of one of the following specifications, as applicable:

a. ***Obstruction Lighting Equipment***.

1. AC 150/5345-43, FAA Specification for Obstruction Lighting Equipment.

2. Military Specifications MIL-L-6273, Light, Navigational, Beacon, Obstacle or Code, Type G-1.

3. Military Specifications MIL-L-7830, Light Assembly, Markers, Aircraft Obstruction.

b. ***Certified Equipment***.

1. AC 150/5345-53, Airport Lighting Certification Program, lists the manufacturers that have demonstrated compliance with the specification requirements of AC 150/5345-43.

2. Other manufacturers' equipment may be used provided that equipment meets the specification requirements of AC 150/5345-43.

c. ***Airport Lighting Installation and Maintenance***.

1. AC 150/5340-21, Airport Miscellaneous Lighting Visual Aids, provides guidance for the installation, maintenance, testing, and inspection of obstruction lighting for airport visual aids such as airport beacons, wind cones, etc.

2. AC 150/5340-26, Maintenance of Airport Visual Aid Facilities, provides guidance on the maintenance of airport visual aid facilities.

d. ***Vehicles.***

1. AC 150/5210-5, Painting, Marking, and Lighting of Vehicles Used on an Airport, contains provisions for marking vehicles principally used on airports.

2. FAA Facilities**.** Obstruction marking for FAA facilities shall conform to FAA Drawing Number D-5480, referenced in FAA Standard FAA-STD-003, Paint Systems for Structures.

124. AVAILABILITY

The standards and specifications listed above may be obtained free of charge from the below-indicated office:

a. ***Military Specifications:***

Standardization Document Order Desk
700 Robbins Avenue
Building #4, Section D
Philadelphia, PA 19111-5094

b. ***FAA Specifications:***

Manager, ASD-110
Department of Transportation
Document Control Center
Martin Marietta/Air Traffic Systems
475 School St., SW.
Washington, DC 20024
Telephone: (202) 646-2047
FAA Contractors Only

c. ***FAA Advisory Circulars:***

Department of Transportation
TASC
Subsequent Distribution Office, SVC-121.23
Ardmore East Business Center
3341 Q 75th Avenue
Landover, MD 20785
Telephone: (301) 322-4961

CHAPTER 13. MARKING AND LIGHTING WIND TURBINE FARMS

130. PURPOSE

This chapter provides guidelines for the marking and lighting of wind turbine farms. For the purposes of this advisory circular, wind turbine farms are defined as a wind turbine development that contains more than three (3) turbines of heights over 200 feet above ground level. The recommended marking and lighting of these structures is intended to provide day and night conspicuity and to assist pilots in identifying and avoiding these obstacles.

131. GENERAL STANDARDS

The development of wind turbine farms is a very dynamic process, which constantly changes based on the differing terrain they are built on. Each wind turbine farm is unique; therefore it is important to work closely with the sponsor to determine a lighting scheme that provides for the safety of air traffic. The following are guidelines that are recommended for wind turbine farms. Consider the proximity to airports and VFR routes, extreme terrain where heights may widely vary, and local flight activity when making the recommendation.

a. Not all wind turbine units within an installation or farm need to be lighted. Definition of the periphery of the installation is essential; however, lighting of interior wind turbines is of lesser importance unless they are taller than the peripheral units.

b. Obstruction lights within a group of wind turbines should have unlighted separations or gaps of no more than ½ statute mile if the integrity of the group appearance is to be maintained. This is especially critical if the arrangement of objects is essentially linear.

c. Any array of flashing or pulsed obstruction lighting should be synchronized or flash simultaneously.

d. Nighttime wind turbine obstruction lighting should consist of the preferred FAA L-864 aviation red-colored flashing lights.

e. White strobe fixtures (FAA L-865) may be used in lieu of the preferred L-864 red flashing lights, but must be used alone without any red lights, and must be positioned in the same manner as the red flashing lights.

f. The white paint most often found on wind turbine units is the most effective daytime early warning device. Other colors, such as light gray or blue, appear to be significantly less effective in providing daytime warning. Daytime lighting of wind turbine farms is not required, as long as the turbine structures are painted in a bright white color or light off-white color most often found on wind turbines.

132. WIND TURBINE CONFIGURATIONS – Prior to recommending marking and lighting, determine the configuration and the terrain of the wind turbine farm. The following is a description of the most common configurations.

a. Linear – wind turbine farms in a line-like arrangement, often located along a ridge line, the face of a mountain or along borders of a mesa or field. The line may be ragged in shape or be periodically broke, and may vary in size from just a few turbines up to 20 miles long.

b. Cluster – turbine farms where the turbines are placed in circles like groups on top of a mesa, or within a large field. A cluster is typically characterized by having a pronounced perimeter, with various turbines placed inside the circle at various, erratic distances throughout the center of the circle.

c. Grid – turbine farms arranged in a geographical shape such as a square or a rectangle, where each turbine is set a consistent distance from each other in rows, giving the appearance that they are part of a square like pattern.

133. MARKING STANDARDS

The bright white or light off-white paint most often found on wind turbines has been shown to be most effective, and if used, no lights are required during the daytime. However, if darker paint is used, wind turbine marking should be supplemented with daytime lighting, as required.

134. LIGHTING STANDARDS

a. Flashing red (L864), or white (L-865) lights may be used to light wind turbines. Studies have shown that red lights are most effective, and should be the first consideration for lighting recommendations of wind turbines.

b. Obstruction lights should have unlighted separations or gaps of no more than ½ mile. Lights should flash simultaneously. Should the synchronization of the lighting system fail, a lighting outage report should be made in accordance with paragraph 23 of this advisory circular. Light fixtures should be placed as high as possible on the turbine nacelle, so as to be visible from 360 degrees.

c. Linear Turbine Configuration. Place a light on each turbine positioned at each end of the line or string of turbines. Lights should be no more than ½ statute mile, or 2640 feet from the last lit turbine. In the event the last segment is significantly short, push the lit turbines back towards the starting point to present a well balanced string of lights. High concentrations of lights should be avoided.

d. Cluster Turbine Configuration. Select a starting point among the outer perimeter of the cluster. This turbine should be lit, and a light should be placed on the next turbine so that no more than a ½ statute mile gap exists. Continue this pattern around the perimeter. If the distance across the cluster is greater than 1 mile, and/or the terrain varies by more than 100 feet, place one or more lit turbines at locations throughout the center of the cluster.

e. Grid Turbine Configuration. Select each of the defined corners of the layout to be lit, and then utilize the same concept of the cluster configuration as outlined in paragraph d.

f. Special Considerations. On occasion, one or two turbines may be located apart from the main grouping of turbines. If one or two turbines protrude from the general limits of the turbine farm, these turbines should be lit.

APPENDIX 1: Specifications for Obstruction Lighting Equipment Classification

APPENDIX

Type	Description
L-810	Steady-burning Red Obstruction Light
L-856	High Intensity Flashing White Obstruction Light (40 FPM)
L-857	High Intensity Flashing White Obstruction Light (60 FPM)
L-864	Flashing Red Obstruction Light (20-40 FPM)
L-865	Medium Intensity Flashing White Obstruction Light (40-FPM)
L-866	Medium Intensity Flashing White Obstruction Light (60-FPM)
L-864/L-865	Dual: Flashing Red Obstruction Light (20-40 FPM) and Medium Intensity Flashing White Obstruction Light (40 FPM)
L-885	Red Catenary 60 FPM
FPM = Flashes Per Minute	

TBL 4

PAINTING AND/OR DUAL LIGHTING OF CHIMNEYS, POLES, TOWERS, AND SIMILAR STRUCTURES

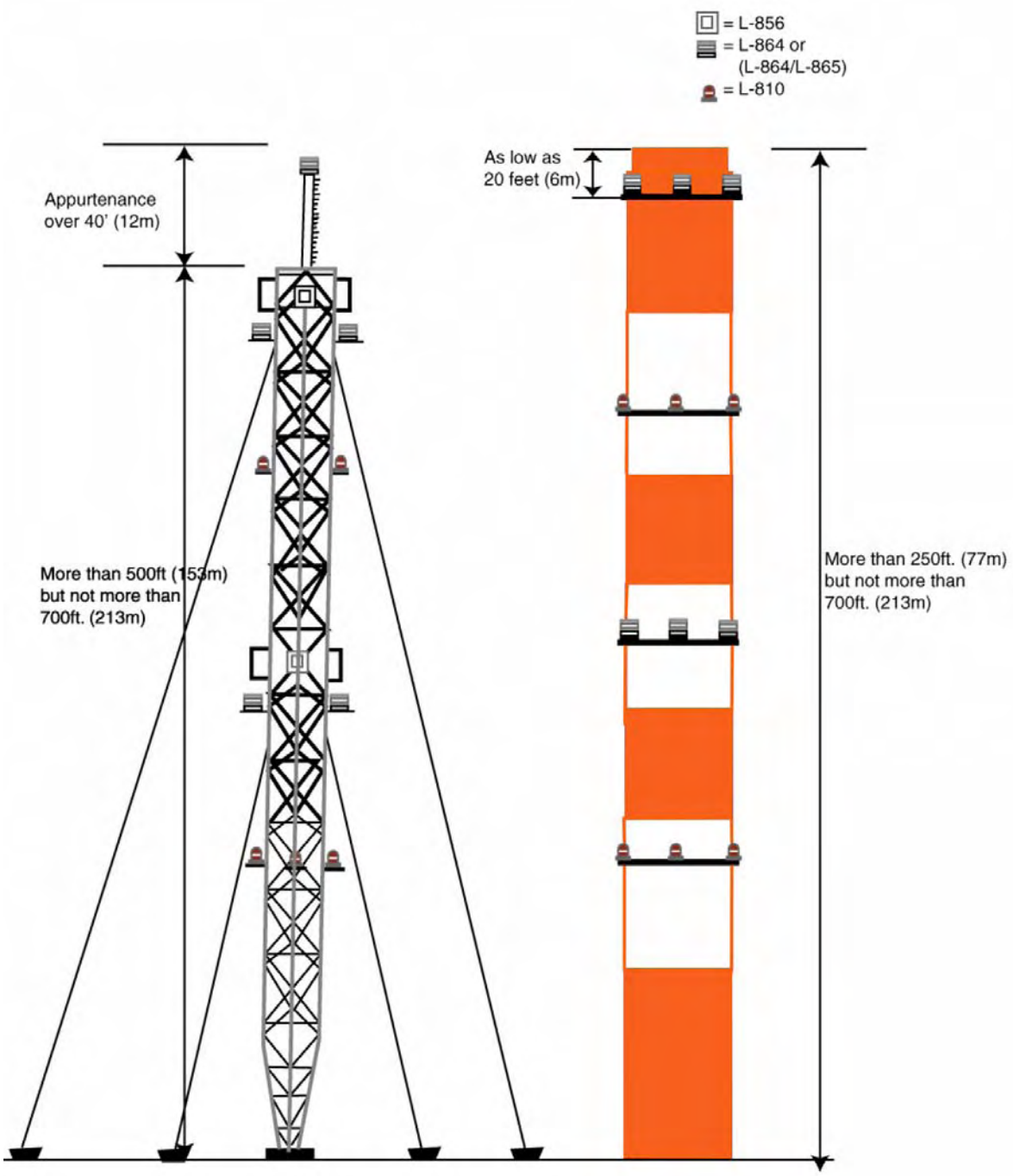
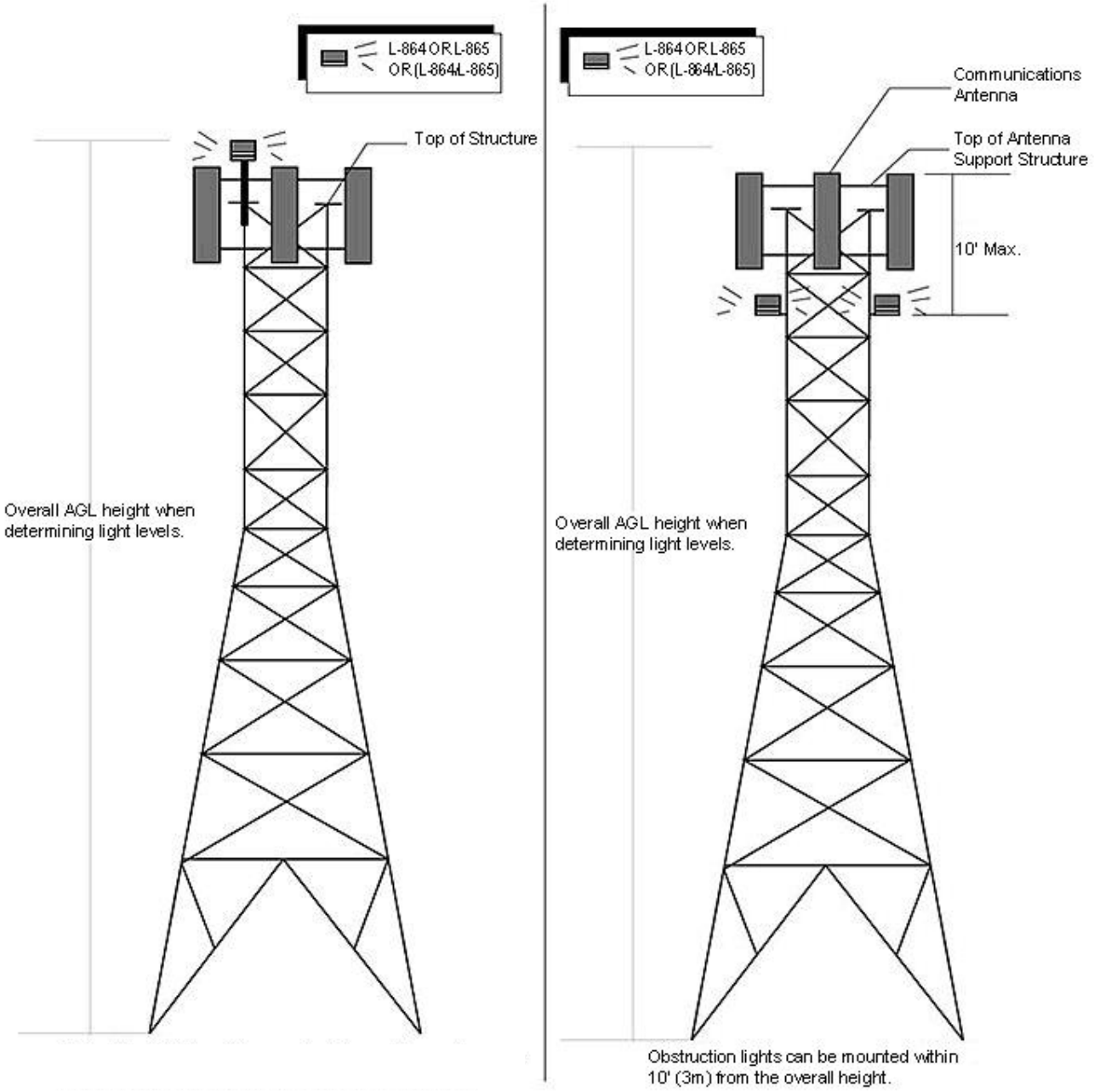


FIG 1



Intermediate lighting not shown. Overall AGL height if more than 200' (61m), but not more than 500' (153m).

FIG 2

PAINTING AND LIGHTING OF WATER TOWERS, STORAGE TANKS, AND SIMILAR STRUCTURES

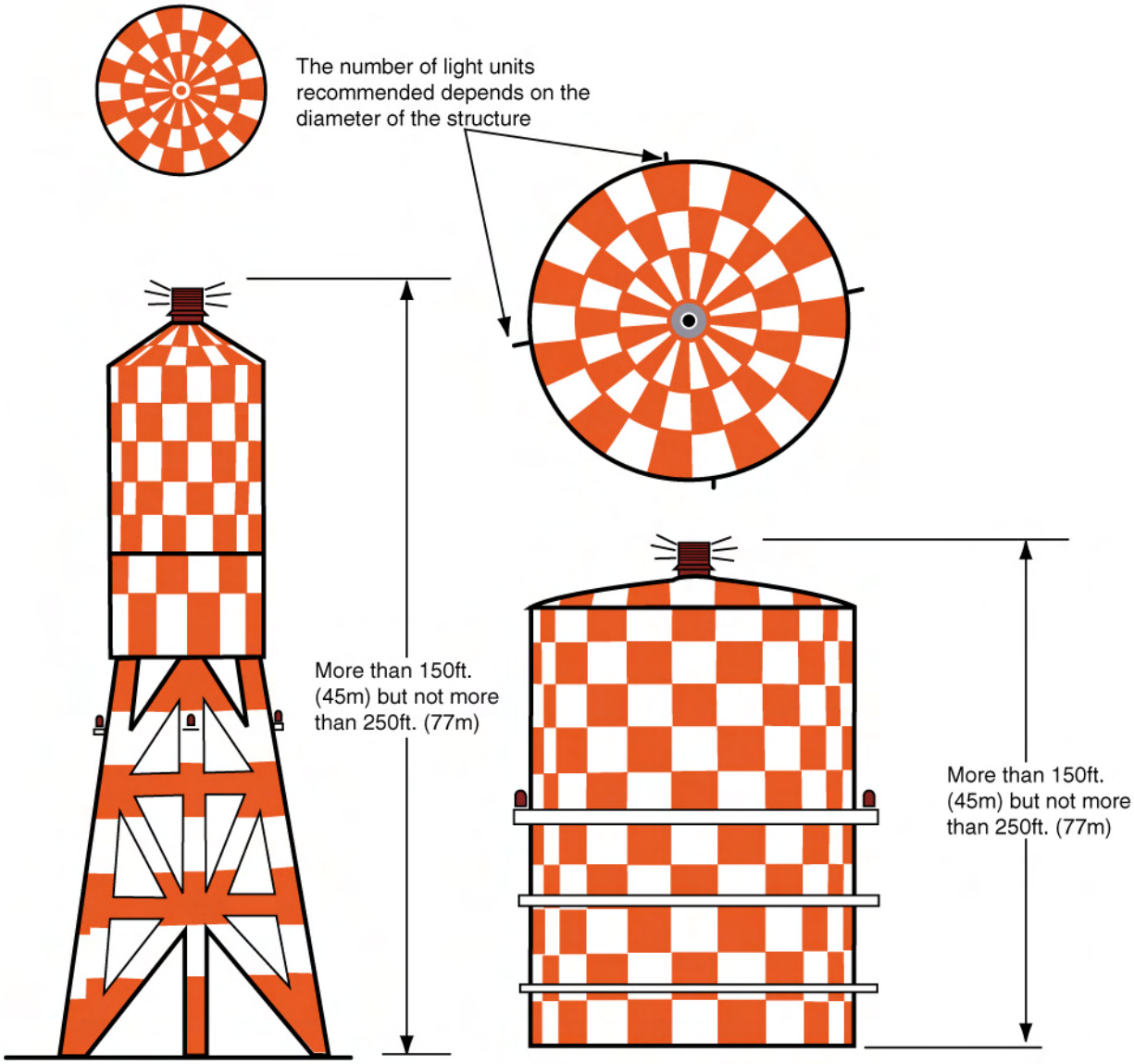


FIG 3

PAINTING AND LIGHTING OF WATER TOWERS ANDE SIMILAR STRUCTURES

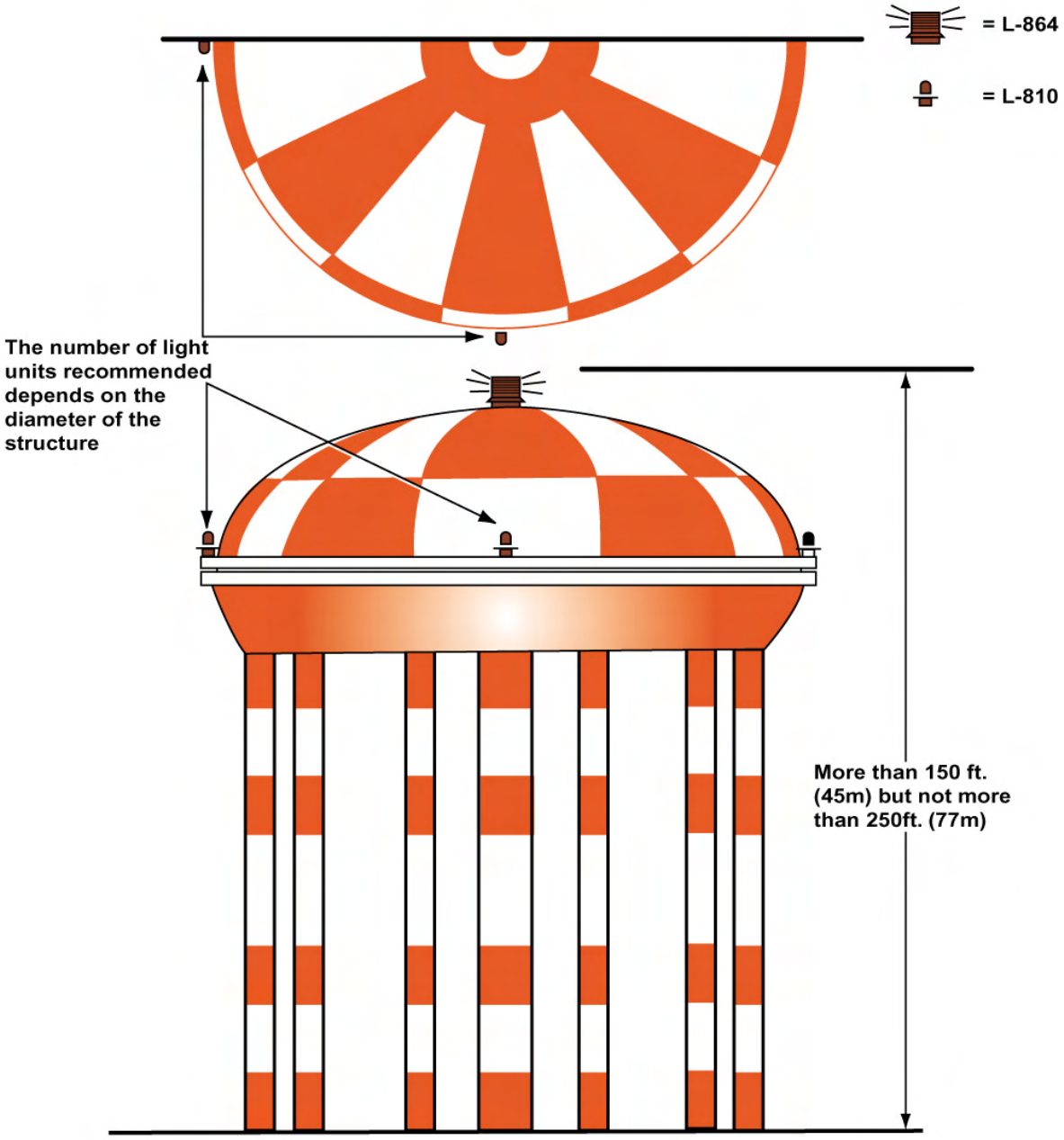


FIG 4

PAINTING OF SINGLE PEDESTAL WATER TOWER BY TEARDROP PATTERN

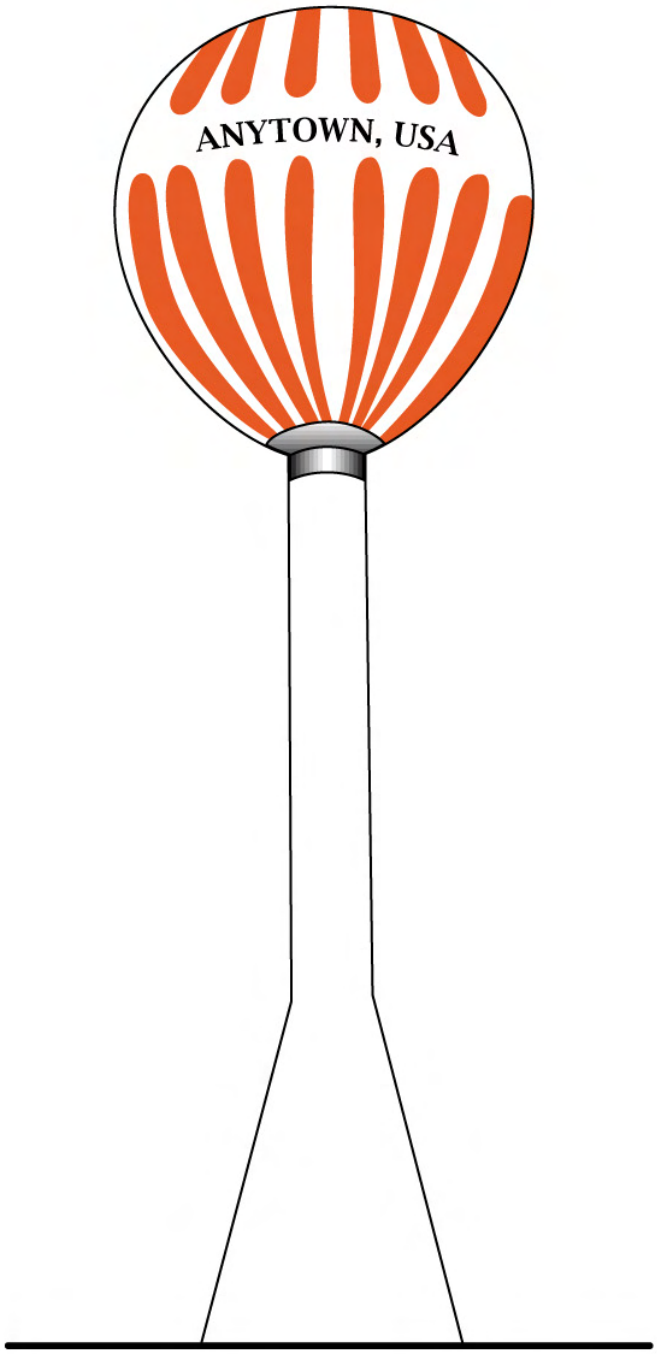
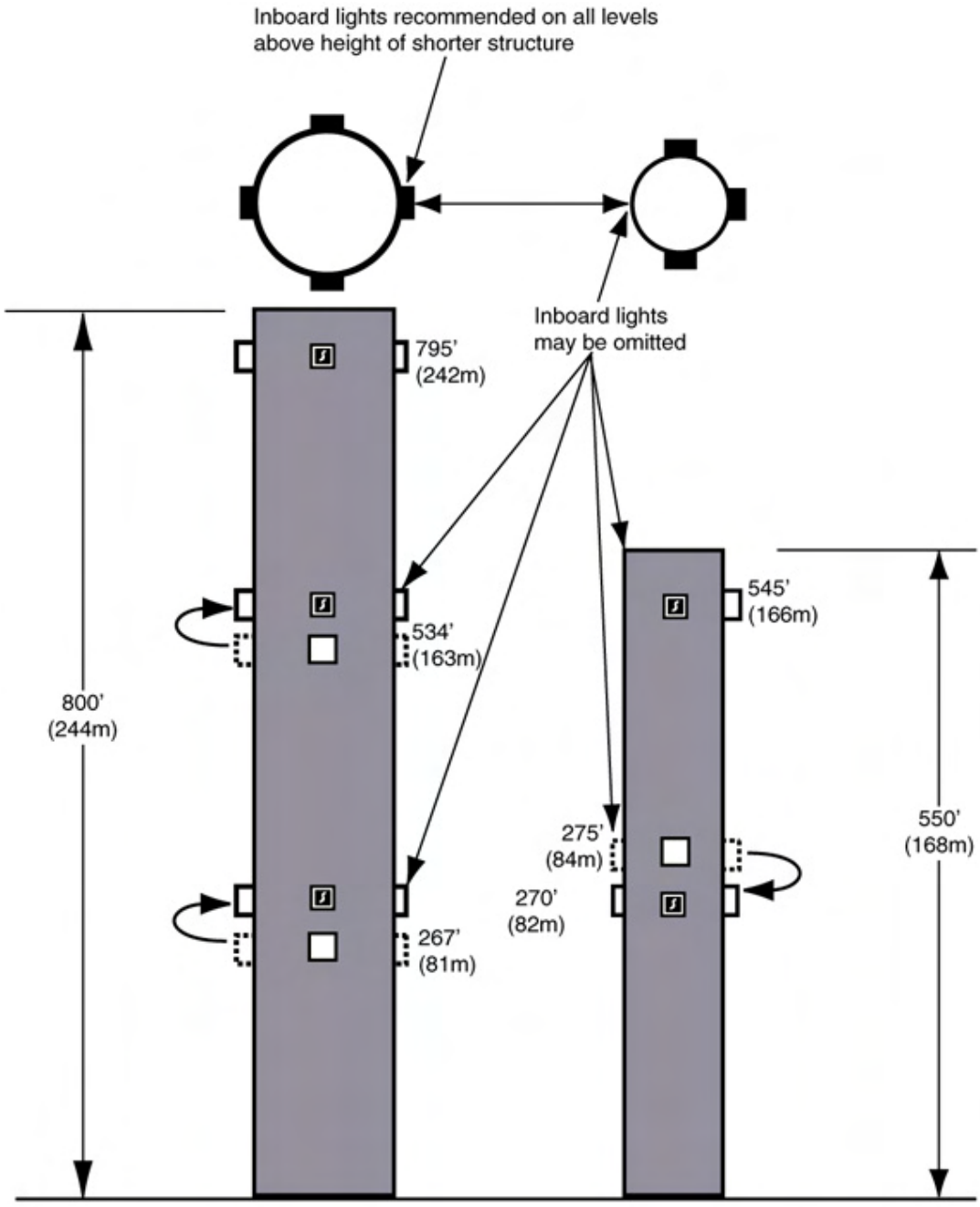


FIG 5

LIGHTING ADJACENT STRUCTURES



Minor adjustments in vertical placement may be made to place lights on same horizontal plane. Lights on both structures be synchronized

FIG 6

Lighting Adjacent Structure

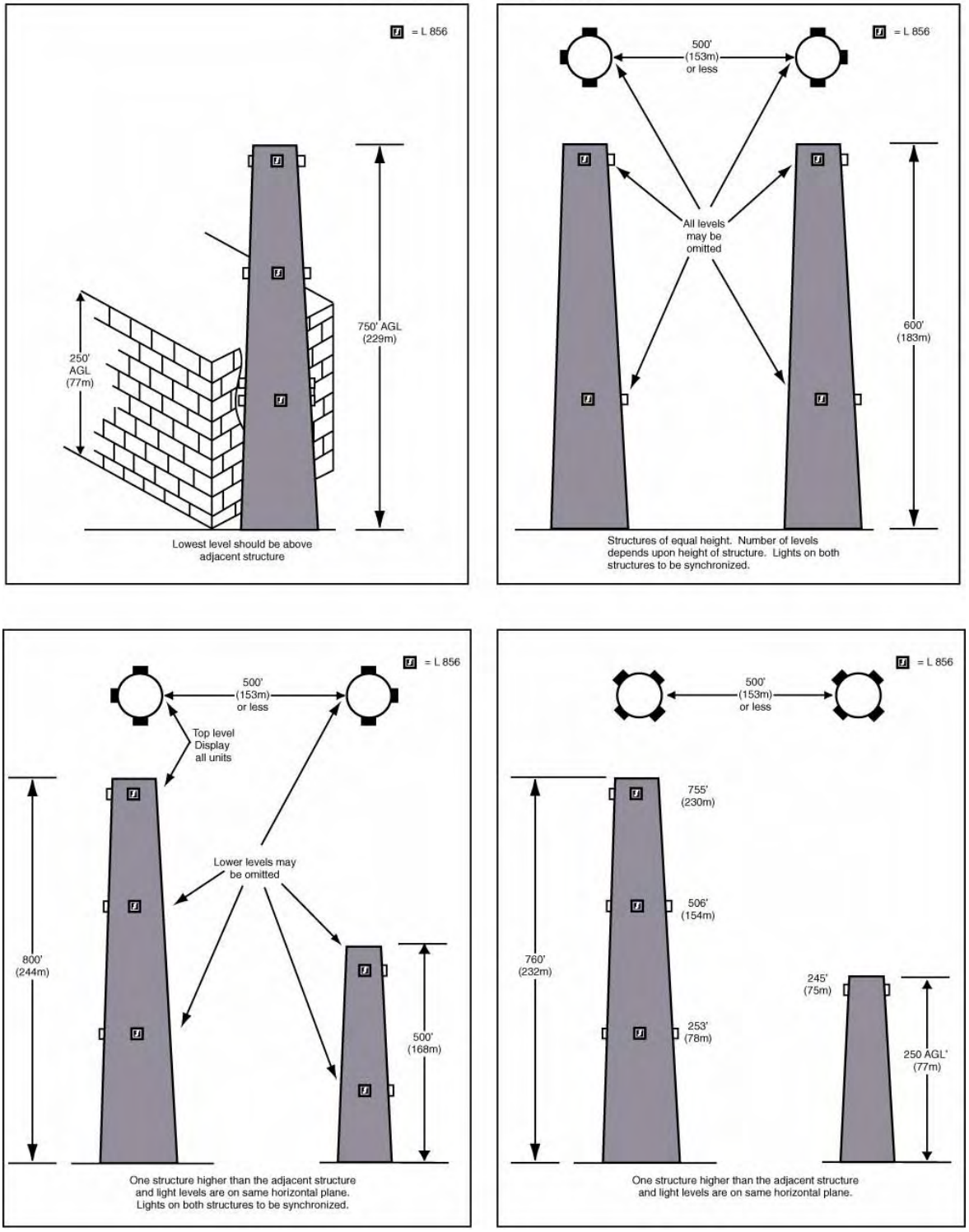


FIG 7

Lighting Adjacent Structure

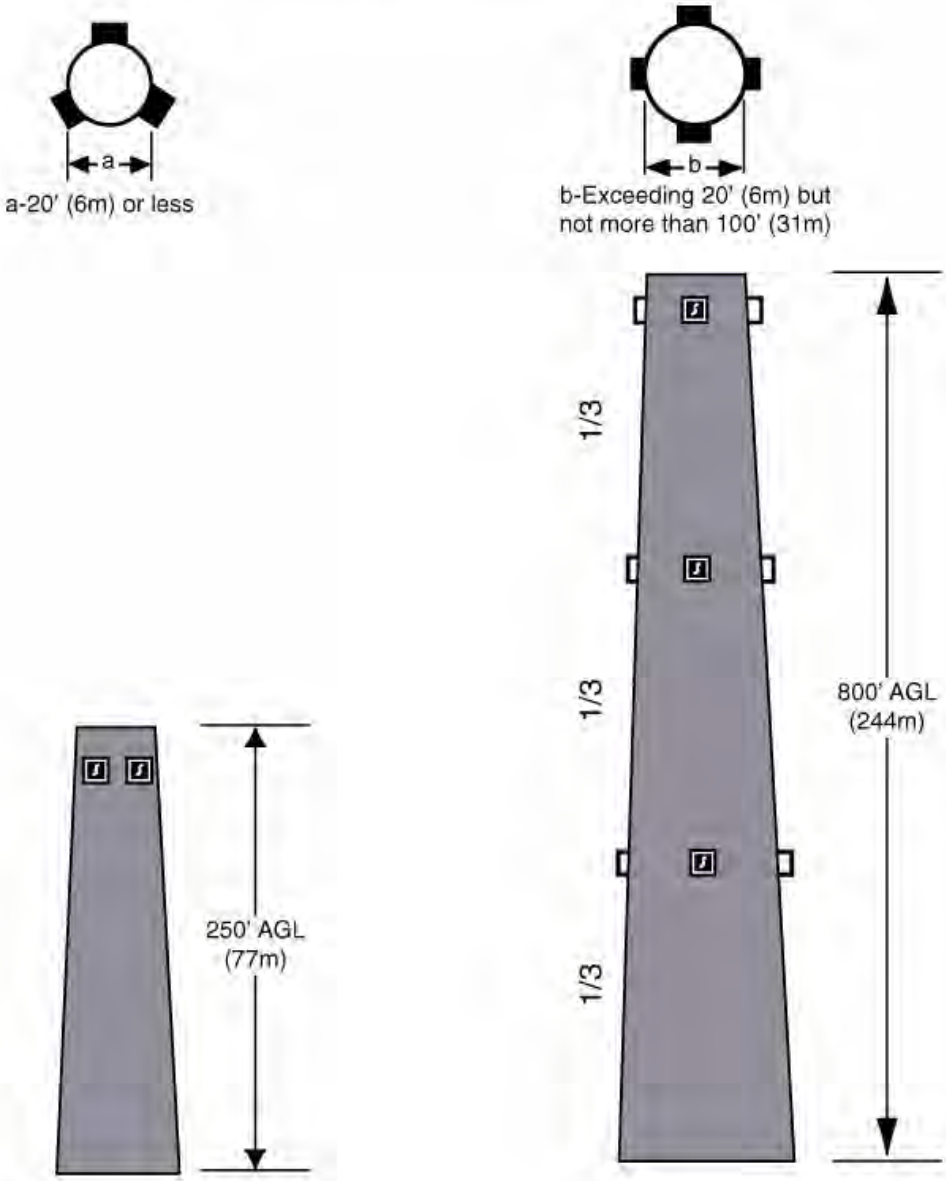


FIG 8

HYPERBOLIC COOLING TOWER

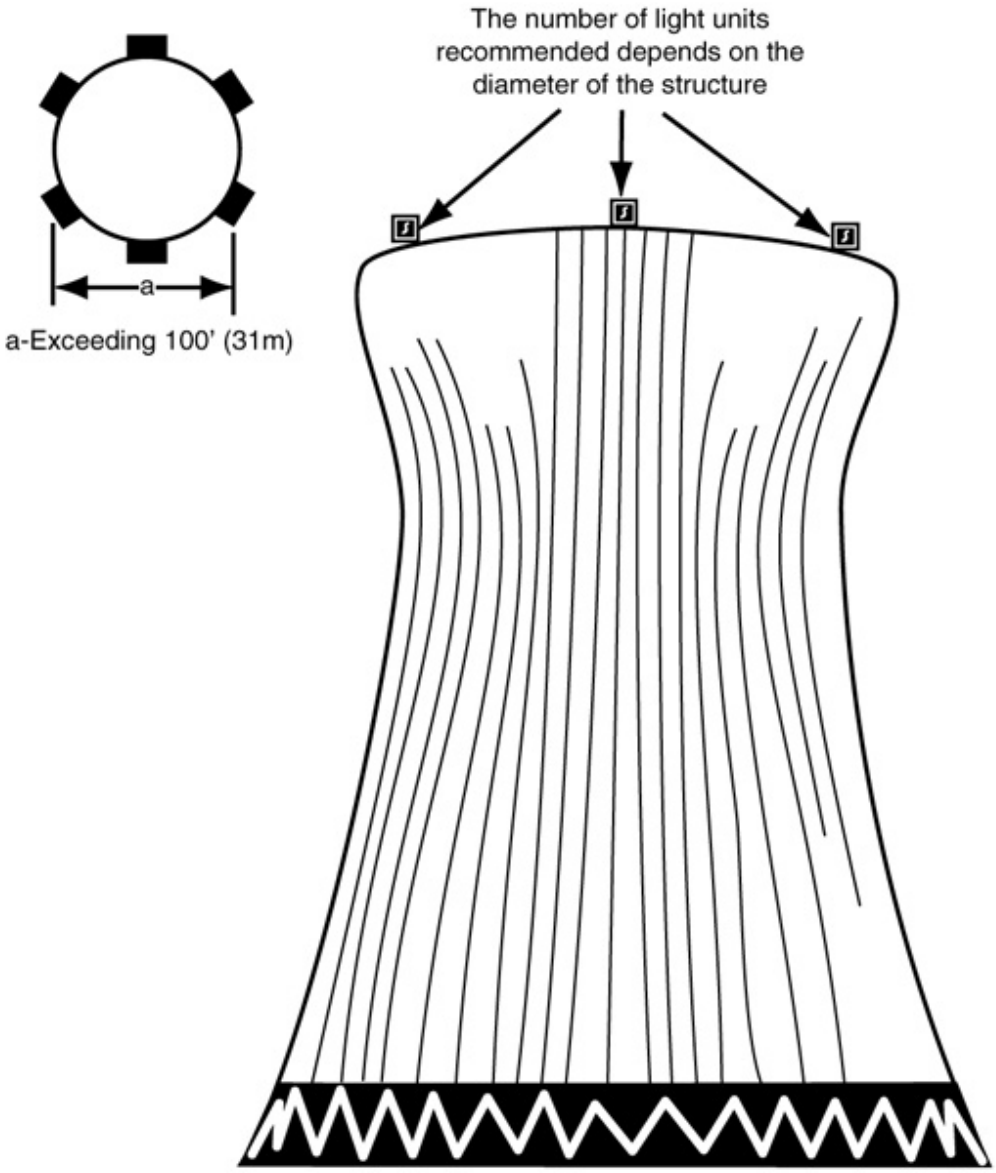


FIG 9

BRIDGE LIGHTING

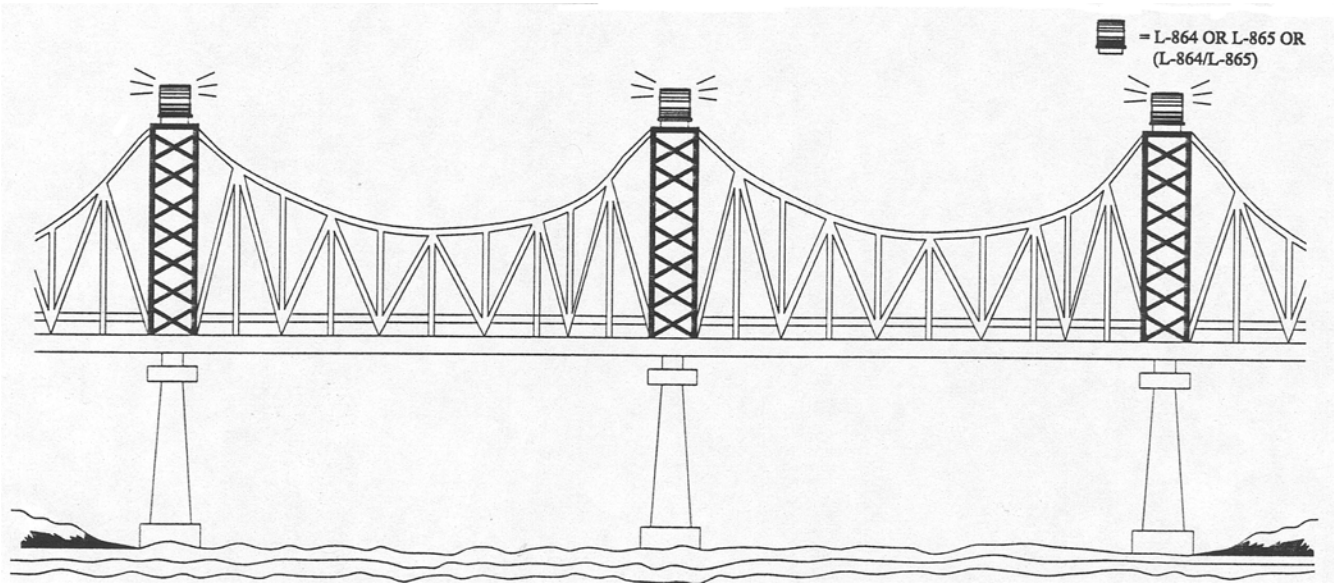
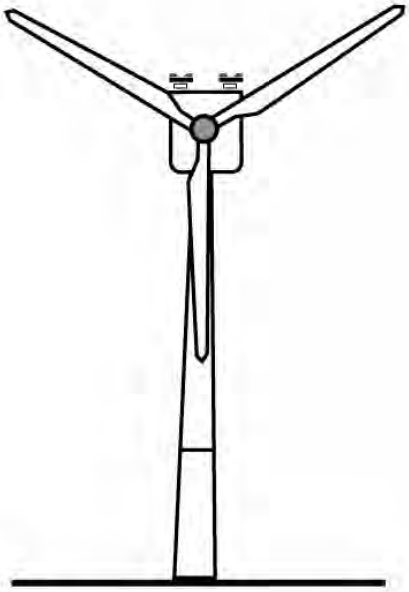
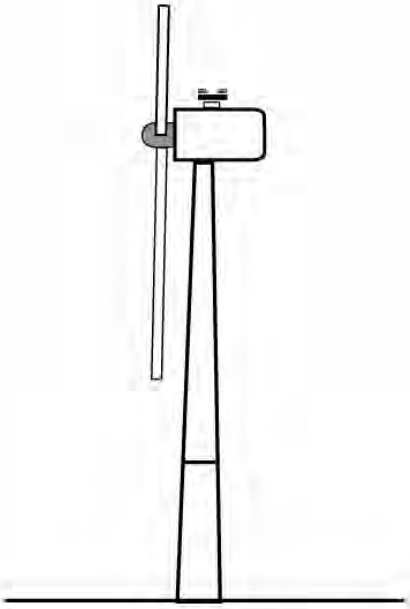


FIG 10

TYPICAL LIGHTING OF A STAND ALONE WIND TURBINE



Front View



Side View

FIG 11

WIND TURBINE GENERATOR

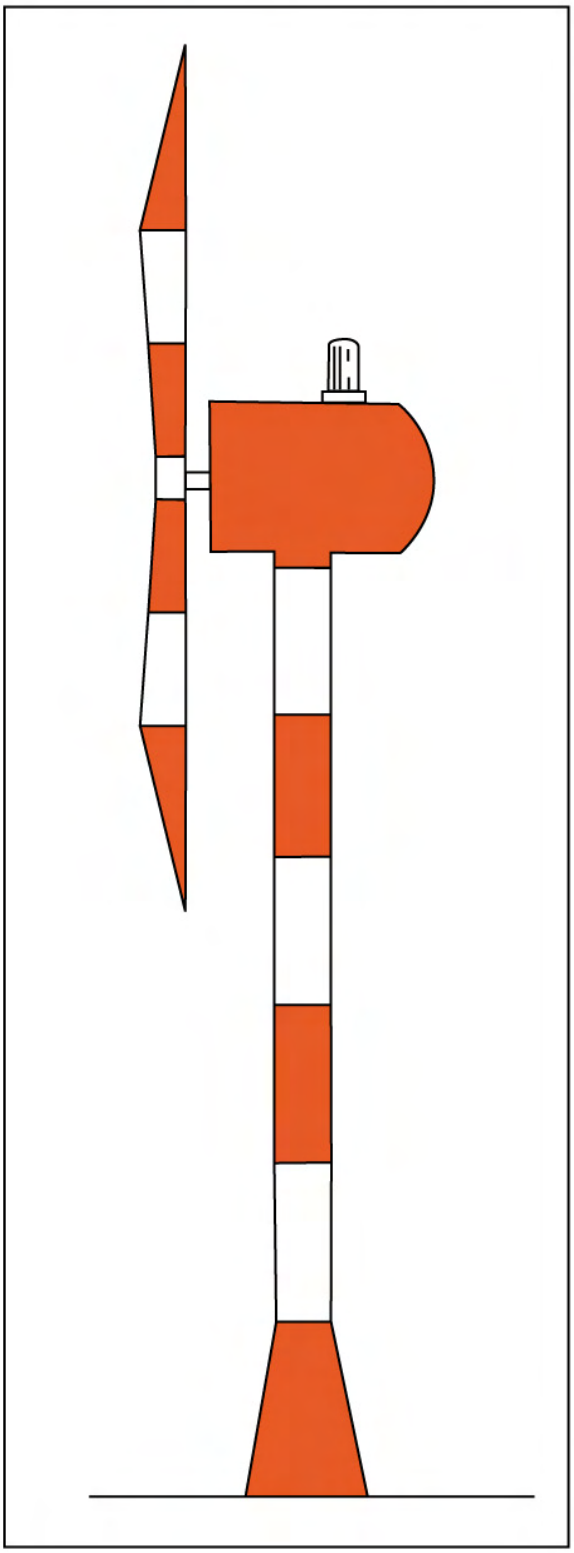
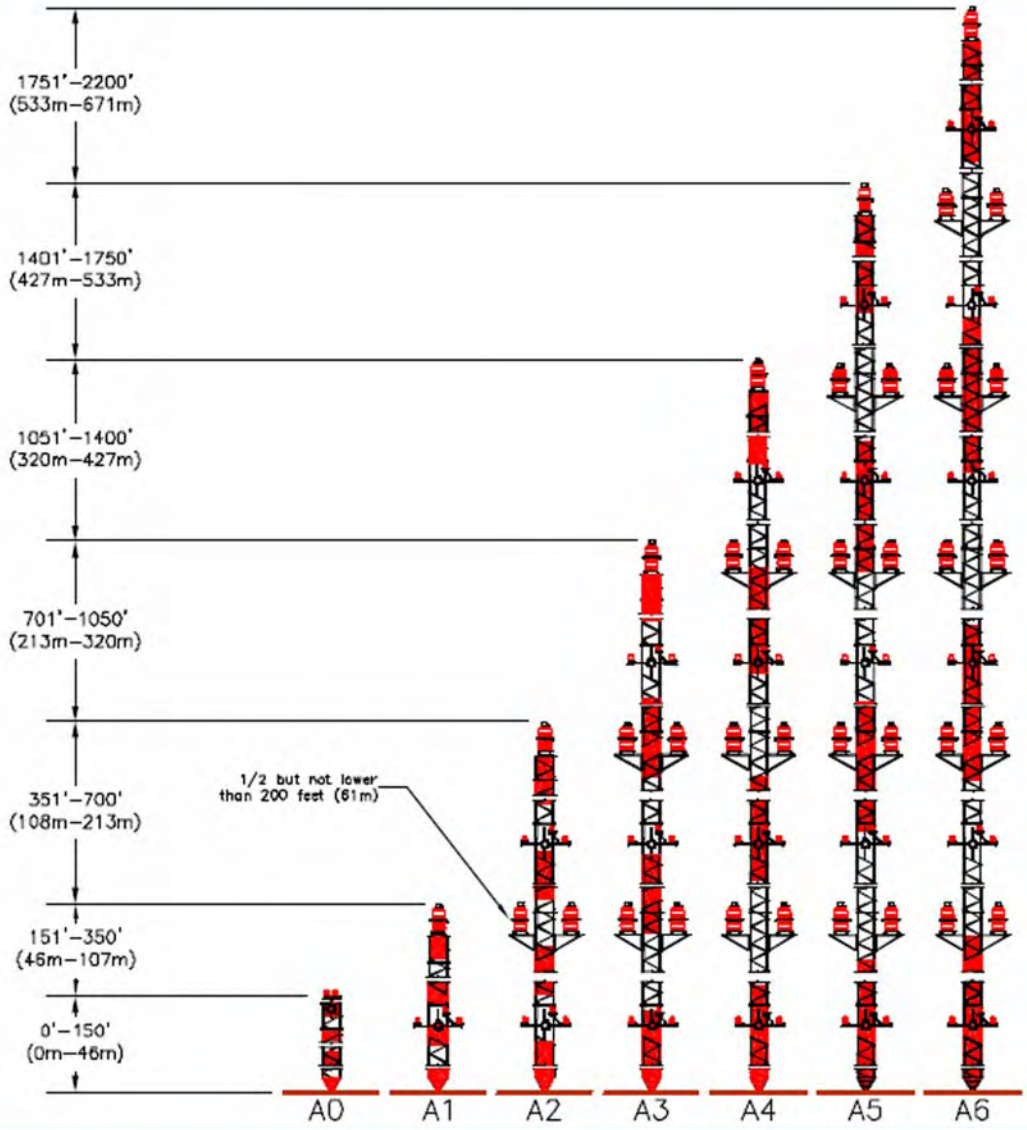


FIG 12

RED OBSTRUCTION LIGHTING STANDARDS (FAA Style A)

Day Protection = Aviation Orange/White Paint
Night Protection = 2,000cd Red Beacon and sidelights



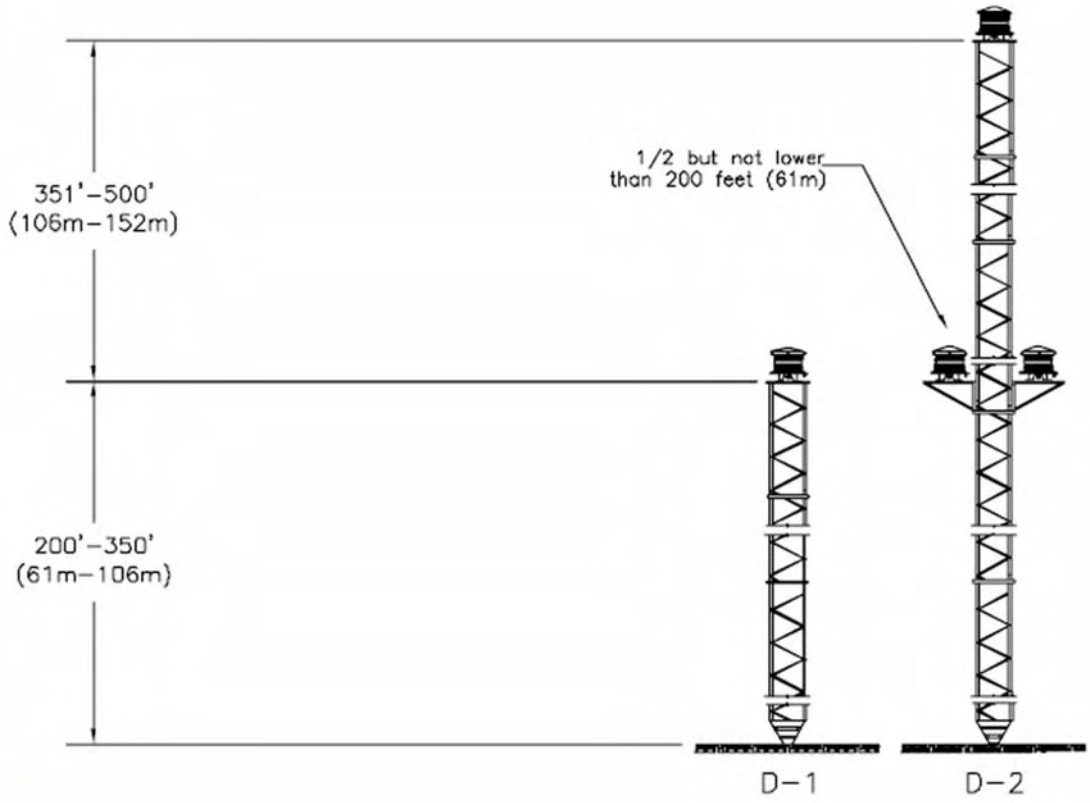
– L–864 Flashing Beacon

– L–810 Obstruction Light

FIG 13

MEDIUM INTENSITY WHITE OBSTRUCTION LIGHTING STANDARDS (FAA Style D)

Day/Twilight Protection = 20,000cd White Strobe
Night Protection = 2,000cd White Strobe
Painting of tower is typically not required.

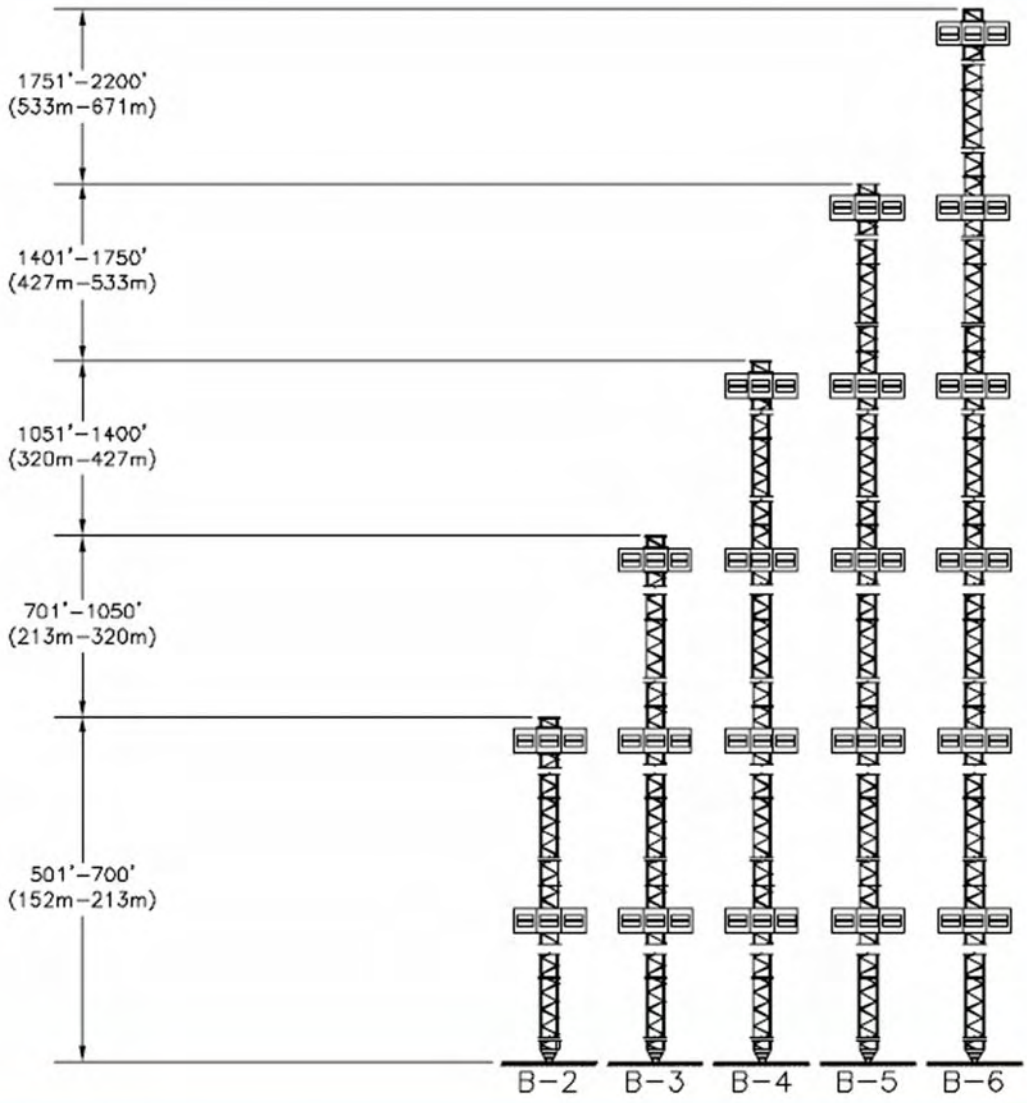


– L–865 Flashing White Strobe

FIG 14

HIGH INTENSITY OBSTRUCTION LIGHTING STANDARDS (FAA Style B)

Day Protection = 200,000cd White Strobe
Twilight Protection = 20,000cd White Strobe
Night Protection = 2,000cd White Strobe

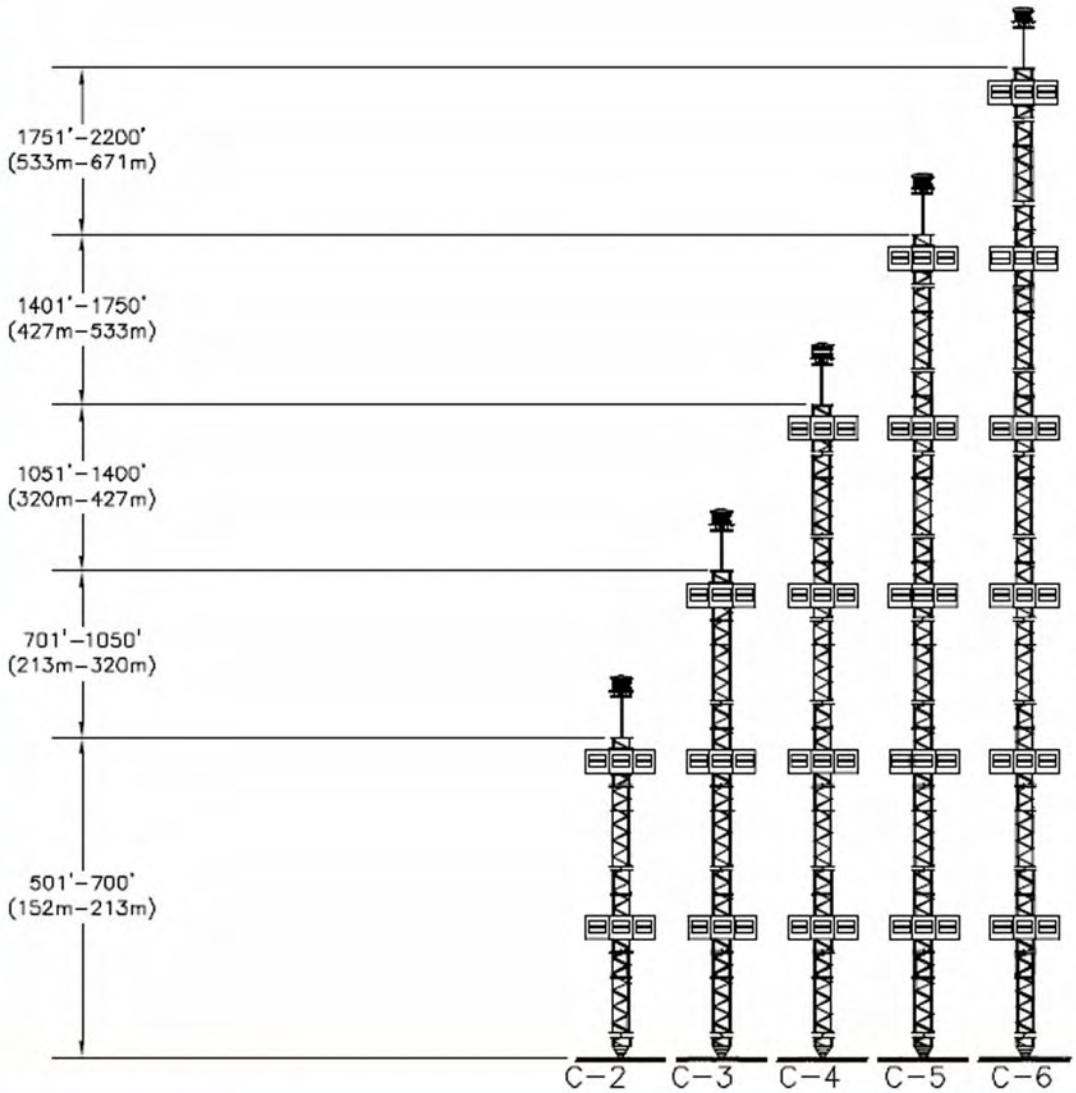


– L–856 High Intensity Strobe (3 Flashheads required per level for 360° coverage)

FIG 15

HIGH INTENSITY OBSTRUCTION LIGHTING STANDARDS (FAA Style C)

Day Protection = 200,000cd White Strobe
Twilight Protection = 20,000cd White Strobe
Night Protection = 2,000cd White Strobe



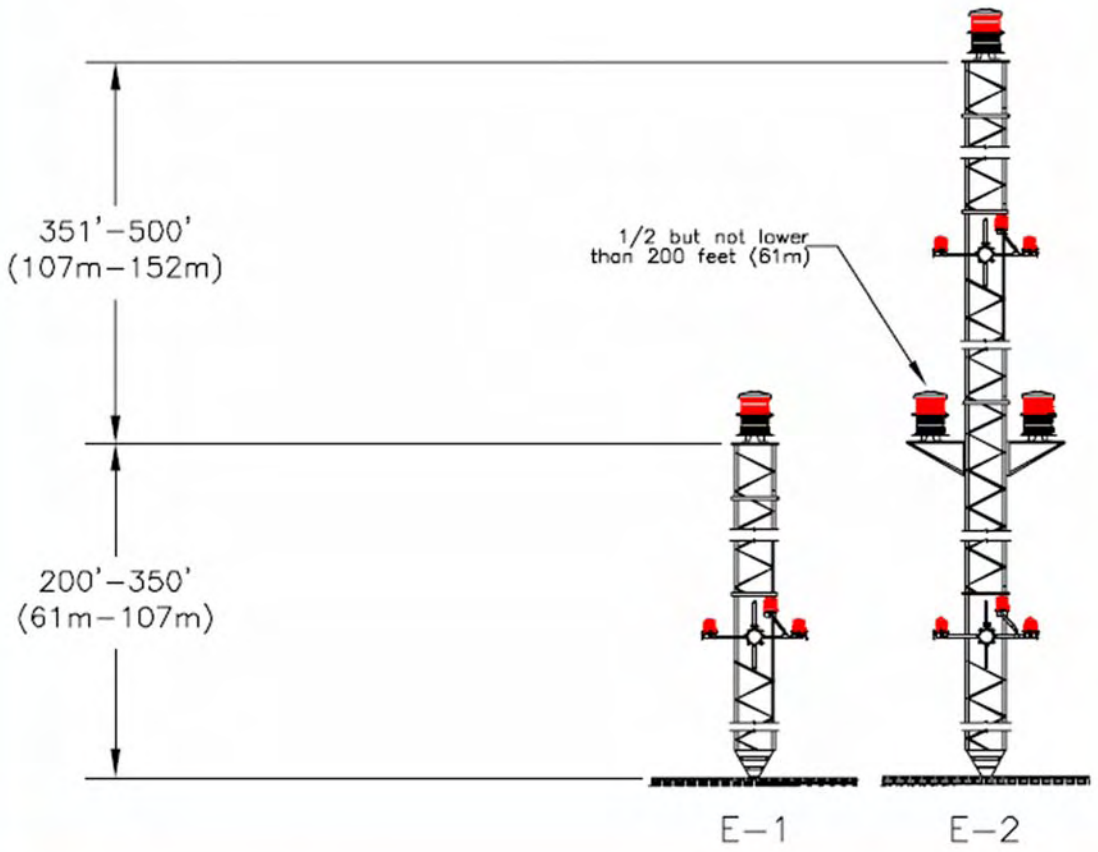
– L–856 High Intensity Strobe (3 Flashheads required per level for 360° coverage)

– L–865 Medium Intensity Strobe required for appurtenances of 40 feet or greater.

FIG 16

MEDIUM INTENSITY DUAL OBSTRUCTION LIGHTING STANDARDS (FAA Style E)

Day/Twilight Protection = 20,000cd White Strobe
Night Protection = 2,000cd Red Strobe and sidelights
Painting of tower is typically not required.



– L–864/L–865 Flashing Dual (White/Red) Strobe

– L–810 Obstruction Light

FIG 17

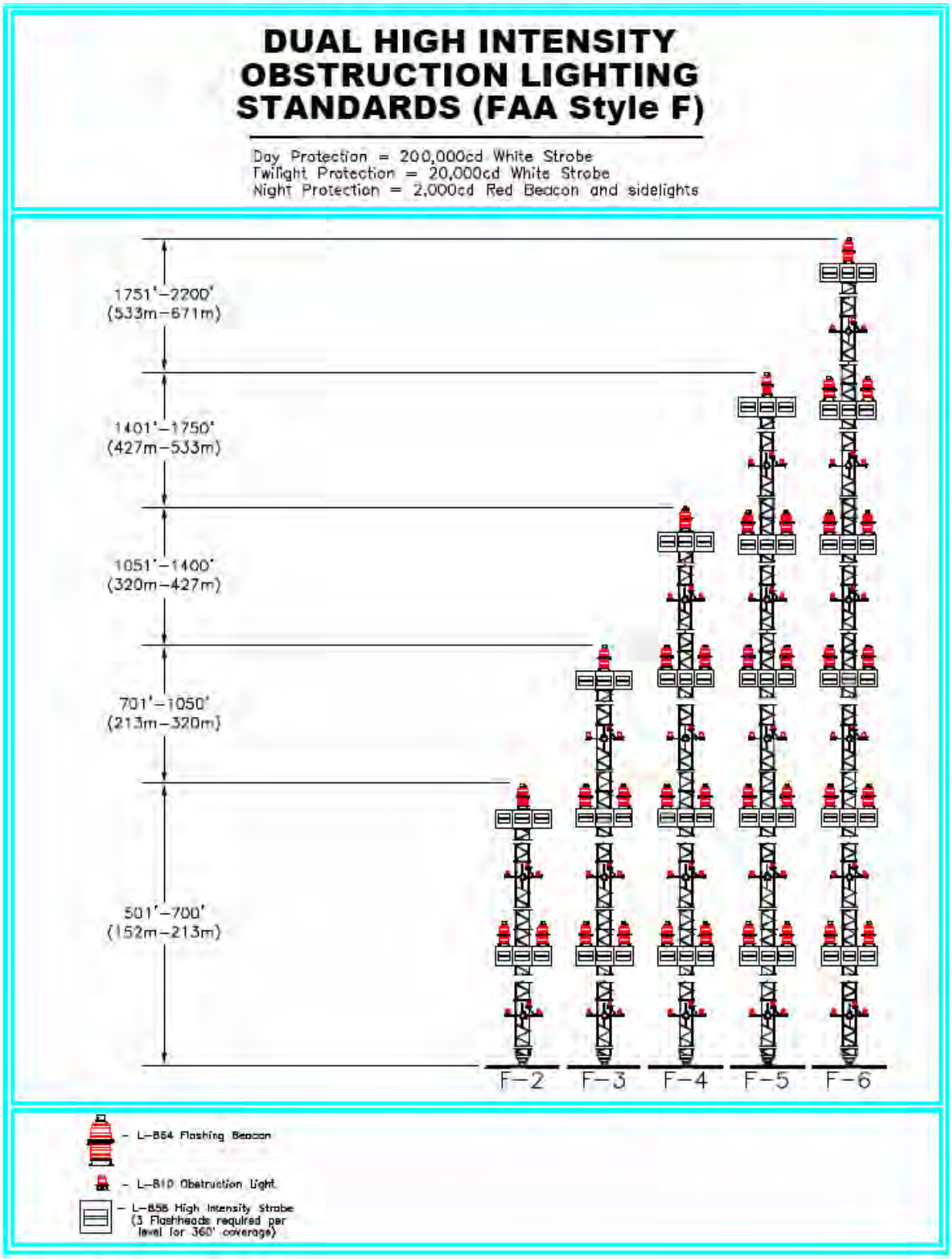

DUAL HIGH INTENSITY
OBSTRUCTION LIGHTING
STANDARDS (FAA Style F)
Day Protection = 200,000cd White Strobe
Twilight Protection = 20,000cd White Strobe
Night Protection = 2,000cd Red Beacon and sidelights
1751'–2200'
(533m–671m)
1401'–1750'
(427m–533m)
1051'–1400'
(320m–427m)
701'–1050'
(213m–320m)
501'–700'
(152m–213m)
F–2
F–3
F–4
F–5
F–6
– L–864 Flashing Beacon
– L–810 Obstruction Light
– L–858 High Intensity Strobe
(3 Flashheads required per level for 360° coverage)

FIG 18

APPENDIX 2. Miscellaneous

1. RATIONALE FOR OBSTRUCTION LIGHT INTENSITIES.

Sections 91.117, 91.119 and 91.155 of the FAR Part 91, General Operating and Flight Rules, prescribe aircraft speed restrictions, minimum safe altitudes, and basic visual flight rules (VFR) weather minimums for governing the operation of aircraft, including helicopters, within the United States.

2. DISTANCE VERSUS INTENSITIES.

TBL 5 depicts the distance the various intensities can be seen under 1 and 3 statute miles meteorological visibilities:

Distance/Intensity Table

Time Period	*Meteorological Visibility Statute Miles*	*Distance Statute Miles*	*Intensity Candelas*
Night		**2.9 (4.7km)**	**1,500 (+/- 25%)**
	3 (4.8km)	**3.1 (4.9km)**	**2,000 (+/- 25%)**
		1.4 (2.2km)	**32**
Day		**1.5 (2.4km)**	**200,000**
	1 (1.6km)	**1.4 (2.2km)**	**100,000**
		1.0 (1.6km)	**20,000 (+/- 25%)**
Day		**3.0 (4.8km)**	**200,000**
	3 (4.8km)	**2.7 (4.3km)**	**100,000**
		1.8 (2.9km)	**20,000 (+/- 25%)**
Twilight	**1 (1.6km)**	**1.0 (1.6km) to 1.5 (2.4km)**	**20,000 (+/- 25%)**?
Twilight	**3 (4.8km)**	**1.8 (2.9km) to 4.2 (6.7km)**	**20,000 (+/- 25%)**?

Note-
1. DISTANCE CALCULATED FOR NORTH SKY ILLUMINANCE.

TBL 5

3. CONCLUSION.

Pilots of aircraft travelling at 165 knots (190 mph/306kph) or less should be able to see obstruction lights in sufficient time to avoid the structure by at least 2,000 feet (610m) horizontally under all conditions of operation, provided the pilot is operating in accordance with FAR Part 91. Pilots operating between 165 knots (190 mph/303 km/h) and 250 knots (288 mph/463 kph) should be able to see the obstruction lights unless the weather deteriorates to 3 statute miles (4.8 kilometers) visibility at night, during which time period 2,000 candelas would be required to see the lights at 1.2 statute miles (1.9km). A higher intensity, with 3 statute miles (4.8 kilometers) visibility at night, could generate a residential annoyance factor. In addition, aircraft in these speed ranges can normally be expected to operate under instrument flight rules (IFR) at night when the visibility is 1 statute mile (1.6 kilometers).

4. DEFINITIONS.

a. Flight Visibility. The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.

Reference-
AIRMAN'S INFORMATION MANUAL
PILOT/CONTROLLER GLOSSARY.

b. Meteorological Visibility. A term that denotes the greatest distance, expressed in statute miles, that selected objects (visibility markers) or lights of moderate intensity (25 candelas) can be seen and identified under specified conditions of observation.

5. LIGHTING SYSTEM CONFIGURATION.

a. *Configuration A.* Red lighting system.

b. *Configuration B.* High Intensity White Obstruction Lights (including appurtenance lighting).

c. *Configuration C.* Dual Lighting System - High Intensity White & Red (including appurtenance lighting).

d. *Configuration D.* Medium Intensity White Lights (including appurtenance lighting).

e. *Configuration E.* Dual Lighting Systems - Medium Intensity White & Red (including appurtenance lighting).

Example-
''CONFIGURATION B 3'' DENOTES A HIGH INTENSITY LIGHTING SYSTEM WITH THREE LEVELS OF LIGHT.

APPENDIX J
AIR QUALITY

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Table 1 - AIRCRAFT EMISSION FACTORS

Aircraft	# of Engines	Aircraft Engine	Power Setting	Fuel Flow rate Lb/HR	Pounds/1000 pounds Fuel THC	CO	NO_X	SO_2	PM_{10}	kg/lb fuel CO_2	g/lb fuel CH_4	g/lb fuel N_2O
KC-135R	4	F108-CF-100	Idle	1,136	0.92	27.19	3.94	1.02	9.08	1.41	0.04	0.05
			Approach	2,547	0.04	6.39	6.96	2.29	1.55	1.41	0.04	0.05
			Intermediate	5,650	0.03	1.61	13.53	5.09	0.65	1.41	0.04	0.05
			Military	**6,458**	**0.03**	**0.63**	**15.28**	**5.81**	**1.59**	1.41	0.04	0.05
				6,458	0.03	0.63	15.28	5.81	1.59	1.41	0.04	0.05
F-15 A/B/C/D	1	F100-PW-100	Idle	1,097	8.6	35.29	4.38		2.06			
			Approach	2,746	0.16	3.49	12.33		2.63			
			Intermediate	7,617	0.14	0.91	30.89		2.06			
			Military	10,104	0.28	0.9	39.44		1.33			
			AB-5	54,074	0.05	9.57	6.62		1.15			
F-15 C/D/E	1	F100-PW-200	Idle	1,016	8.26	26.61	4.99	0.91	2.06	1.41	0.04	0.05
			Approach	3,135	17.62	1.38	13.82	2.82	2.63	1.41	0.04	0.05
			Intermediate	5,406	4.97	0.49	27.6	4.86	2.06	1.41	0.04	0.05
			Military	8,717	3.47	0.86	39.12	7.84	1.33	1.41	0.04	0.05
			AB-5	40,247	0.32	9.47	7.03	36.22	1.15	1.41	0.04	0.05
F-15 E	1	F100-PW-229	Idle	1,087	0.38	10.16	3.8		2.06			
			Approach	3,098	0.21	1.17	15.08		2.63			
			Intermediate	5,838	0.3	0.15	17.53		2.06			
			Military	11,490	0.54	0.66	57.65		1.33			
			AB-1	20,793	16.26	76.62	50.92		1.15			
			Average[2]	**10,103.67**	**1.43**	**0.81**	**45.40**	**7.84**	**1.33**	**1.41**	**0.04**	**0.05**
F-16A/B	1	F100-PW-200	Idle	1,016	8.26	26.61	4.99	0.91	2.06	1.41	0.04	0.05
			Approach	3,135	17.62	1.38	13.82	2.82	2.63	1.41	0.04	0.05
			Intermediate	5,406	4.97	0.49	27.6	4.86	2.06	1.41	0.04	0.05
			Military	8,717	3.47	0.86	39.12	7.84	1.33	1.41	0.04	0.05
			AB-5	40,247	0.32	9.47	7.03	36.22	1.15	1.41	0.04	0.05
F-16C/D	1	F110-GE-129	Idle	1,036	2.64	34.58	3.19	0.93	2.61	1.41	0.04	0.05
			Approach	4,956	0.05	3.85	11.6	4.46	1.37	1.41	0.04	0.05
			Intermediate	7,136	0.01	2.49	17.33	6.42	0.57	1.41	0.04	0.05
			Military	9,985	0.54	2.42	27.13	8.99	0.14	1.41	0.04	0.05
			AB-1	16,826	64.8	104.6	15.08	15.14	3.34	1.41	0.04	0.05
F-16N	1	F110-GE-100	Idle	1,044	2.1	31.06	4.33	0.94	1.84	1.41	0.04	0.05
			Approach	4,128	0.36	4	10.87	3.72	0.95	1.41	0.04	0.05
			Intermediate	6,598	0.19	2.2	18.25	5.94	0.57	1.41	0.04	0.05
			Military	9,974	0.62	2.05	30.35	8.98	0.14	1.41	0.04	0.05
			AB-1	16,374	69.33	97.5	15.55	14.74	3.34	1.41	0.04	0.05
			Idle	1,032	4	31	4	1	2	1.41	0.04	0.05
			Approach	4,073	6	3	12	4	2	1.41	0.04	0.05
			Intermediate	6,380	2	2	21	6	1	1.41	0.04	0.05
			Military	9,559	2	2	32	9	1	1.41	0.04	0.05
			AB-1	24,482	45	71	13	22	3	1.41	0.04	0.05
			Average[2]	**9,559**	**2**	**2**	**32**	**9**	**1**	**1.41**	**0.04**	**0.05**
B-1B	4	F101-GE-102	Idle	1,117		24.47	4.1	1.01	2.17	1.41	0.04	0.05
			Approach	4,533	0.14	1.03	9.16	4.08	4.23	1.41	0.04	0.05
			Intermediate	6,557	0.13	0.85	13.15	5.9	1.35	1.41	0.04	0.05
			Military	**7,828**	**0.11**	**0.83**	**12.83**	**7.05**	**1.68**	1.41	0.04	0.05
			AB-1	15,314	61.82	43.47	16.91	13.78	2.86	1.41	0.04	0.05
				7,828	0	1	13	7	2	1	0.04	0.05
B-2	4	F118-GE-100	Idle	1,097	0.59	20.98	4.3	0.99	1.25	1.41	0.04	0.05
			Approach	3,773	0.87	2.02	11.09	3.4	4.47	1.41	0.04	0.05
			Intermediate	6,350	ND	0.84	18.01	5.72	1.78	1.41	0.04	0.05
			Military	**10,887**	**ND**	**0.65**	**33.12**	**9.8**	**1.64**	1.41	0.04	0.05
				10,887	ND	0.65	33.12	9.8	1.64	1.41	0.04	0.05
B-52H	8	TF33-P-3	Idle	900	90.91	95.06	1.39	0.81	4.98	1.41	0.04	0.05
			Approach	3,800	1.37	5.24	6.37	3.42	3.55	1.41	0.04	0.05
			Intermediate	6,240	1.5	2.11	7.88	5.62	3.15	1.41	0.04	0.05
			Military	**7,440**	**0.55**	**1.19**	**12.08**	**6.7**	**3.67**	1.41	0.04	0.05
				7,440.00	0.55	1.19	12.08	6.70	3.67	1.41	0.04	0.05

Notes:

(1) Unless otherwise cited, all data on this page are from Table 3-3 of "Air Emissions Inventory Guidance Document for Mobile Sources at Air Force Installations" IERA-RS-BR-SR-2001-0010, AF IERA, Brooks Air Force Base TX, January 2002.

(2) Millitary Mode Averages were not taken from the AF IERA

(3) JP-8 (jet fuel density) - 6.8 lb/gallon

Table 2 - Baseline Airfield Emissions

AirspaceUnit	Aircraft	*Total Hours*		VOC (TPY)	CO (TPY)	NO_X (TPY)	SO_2 (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	CO_2 (Metric TPY)	CH_4 (Metric TPY)	N_2O (Metric TPY)	CO_2e (Metric TPY)
Powder River A MOA	B-1	106		0.18	1.38	21.34	11.73	2.79	2.79	4,682.05	0.13	0.15	4,731.84
	B-52	0		0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.45
	Tankers [1]	0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	2		0.01	0.02	0.28	0.07	0.00	0.00	79.32	0.00	0.00	80.16
			TOTAL	***0.20***	***1.40***	***21.62***	***11.80***	***2.80***	***2.80***	**4,761.81**	**0.13**	**0.15**	**4,812.45**
Powder River B MOA	B-1	106		0.18	1.38	21.34	11.73	2.79	2.79	4,682.05	0.13	0.15	4,731.84
	B-52	0		0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
	Tankers [1]	0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	2		0.01	0.02	0.28	0.07	0.00	0.00	79.32	0.00	0.00	80.16
			TOTAL	***0.18***	***1.38***	***21.34***	***11.73***	***2.79***	***2.79***	**4,761.37**	**0.13**	**0.15**	**4,812.00**
			TOTAL	**0.38**	**2.78**	**42.96**	**23.53**	**5.59**	**5.59**	**9,523.18**	**0.27**	**0.31**	**9,624.45**

GHG Baseline Airfield Emissions

Table 3 - Alternative A Airfield Emissions

AirspaceUnit	Aircraft	*Total Hours*		VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
													-
Powder River 1 MOA	B-1	97.5		0.17	1.27	19.58	10.76	2.56	2.56	4,295.59	0.12	0.14	4,341.27
	B-52	29.7		0.49	1.05	10.69	5.93	3.25	3.25	1,310.09	0.04	0.04	1,324.02
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	3.9		0.03	0.03	0.60	0.16	0.01	0.01	172.74	0.00	0.01	174.58
AirspaceUnit	Aircraft		***TOTAL***	***0.68***	***2.35***	***30.87***	***16.85***	***5.82***	***5.82***	**5,778.42**	**0.16**	**0.19**	**5,839.87**
													-
Powder River 2 MOA	B-1	165.7		0.29	2.15	33.28	18.29	4.36	4.36	7,300.47	0.21	0.24	7,378.11
	B-52	48.7		0.80	1.72	17.49	9.70	5.31	5.31	2,143.83	0.06		2,145.10
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	4.3		0.03	0.04	0.66	0.18	0.01	0.01	189.49	0.01	0.01	191.50
AirspaceUnit	Aircraft		***TOTAL***	***1.11***	***3.91***	***51.43***	***28.16***	***9.68***	***9.68***	**9,633.78**	**0.27**	**0.24**	**9,714.71**
													-
Powder River 3 MOA	B-1	91.1		0.16	1.18	18.30	10.06	2.40	2.40	4,015.77	0.11	0.13	4,058.47
	B-52	5.4		0.09	0.19	1.94	1.08	0.59	0.59	238.40	0.01	0.01	240.93
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	2.7		0.02	0.02	0.42	0.11	0.01	0.01	118.98	0.00	0.00	120.24
AirspaceUnit	Aircraft		***TOTAL***	***0.27***	***1.40***	***20.67***	***11.25***	***2.99***	***2.99***	**4,373.14**	**0.12**	**0.14**	**4,419.65**
													-
Powder River 4 MOA	B-1	94.6		0.16	1.23	19.00	10.44	2.49	2.49	4,169.12	0.12	0.14	4,213.45
	B-52	29.7		0.49	1.05	10.69	5.93	3.25	3.25	1,310.09	0.04	0.04	1,324.02
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	3.4		0.02	0.03	0.52	0.14	0.01	0.01	148.94	0.00	0.00	150.53
AirspaceUnit	Aircraft		***TOTAL***	***0.67***	***2.31***	***30.21***	***16.51***	***5.74***	***5.74***	**5,628.15**	**0.16**	**0.18**	**5,688.01**
													-
GAP A MOA	B-1	2.8		0.00	0.04	0.55	0.30	0.07	0.07	121.62	0.00	0.00	122.92
	B-52	0.0		0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	0.5		0.00	0.00	0.08	0.02	0.00	0.00	22.91	0.00	0.00	23.16
AirspaceUnit	Aircraft		***TOTAL***	***0.01***	***0.04***	***0.63***	***0.33***	***0.07***	***0.07***	**144.54**	**0.00**	**0.00**	**146.07**
													-
GAP B MOA	B-1	3.7		0.01	0.05	0.75	0.41	0.10	0.10	164.81	0.00	0.01	166.56
	B-52	0.0		0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	0.7		0.01	0.01	0.11	0.03	0.00	0.00	31.73	0.00	0.00	32.07
AirspaceUnit	Aircraft		***TOTAL***	***0.01***	***0.05***	***0.86***	***0.44***	***0.10***	***0.10***	**196.54**	**0.01**	**0.01**	**198.63**
													-
GAP C MOA	B-1	1.9		0.00	0.03	0.39	0.21	0.05	0.05	85.49	0.00	0.00	86.40
	B-52	0.0		0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	0.4		0.00	0.00	0.06	0.01	0.00	0.00	15.86	0.00	0.00	16.03
			TOTAL	***0.01***	***0.03***	***0.45***	***0.23***	***0.05***	***0.05***	**101.35**	**0.00**	**0.00**	**102.43**
			TOTAL	**2.76**	**10.10**	**135.12**	**73.77**	**24.47**	**24.47**	**25,855.93**	**0.73**	**0.77**	**26,109.36**

GHG Alt. A Airfield Emissions

Table 4 - Alternative B Airfield Emissions

AirspaceUnit	Aircraft	*Total Hours*		VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
													-
Powder River 2 MOA	B-1	168.6		0.29	2.19	33.87	18.61	4.44	4.44	7,431.35	0.21	0.24	7,510.38
	B-52	48.7		0.80	1.72	17.49	9.70	5.31	5.31	2,143.83	0.06	0.07	2,166.63
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	4.8		0.04	0.04	0.73	0.20	0.01	0.01	209.76	0.01	0.01	211.99
AirspaceUnit	Aircraft		***TOTAL***	***1.12***	***3.95***	***52.10***	***28.51***	***9.76***	***9.76***	**9,784.93**	**0.28**	**0.32**	**9,888.99**
Powder River 3 MOA	B-1	92.9		0.16	1.21	18.66	10.25	2.44	2.44	4,094.20	0.12	0.13	4,137.74
	B-52	5.4		0.09	0.19	1.94	1.08	0.59	0.59	238.40	0.01	0.01	240.93
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	3.0		0.02	0.03	0.47	0.12	0.01	0.01	133.96	0.00	0.00	135.39
AirspaceUnit	Aircraft		***TOTAL***	***0.27***	***1.42***	***21.08***	***11.46***	***3.04***	***3.04***	**4,466.56**	**0.13**	**0.14**	**4,514.06**
Powder River 4 MOA	B-1	96.9		0.17	1.26	19.46	10.69	2.55	2.55	4,269.59	0.12	0.14	4,314.99
	B-52	29.7		0.49	1.05	10.69	5.93	3.25	3.25	1,310.09	0.04	0.04	1,324.02
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	3.8		0.03	0.03	0.58	0.16	0.01	0.01	167.45	0.00	0.01	169.23
AirspaceUnit	Aircraft		***TOTAL***	***0.68***	***2.34***	***30.73***	***16.78***	***5.81***	***5.81***	**5,747.13**	**0.16**	**0.19**	**5,808.25**
GAP B MOA	B-1	4.3		0.01	0.06	0.86	0.47	0.11	0.11	189.04	0.01	0.01	191.05
	B-52	0.0		0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	0.8		0.01	0.01	0.13	0.03	0.00	0.00	36.13	0.00	0.00	36.52
AirspaceUnit	Aircraft		***TOTAL***	***0.01***	***0.06***	***0.99***	***0.51***	***0.11***	***0.11***	**225.18**	**0.01**	**0.01**	**227.57**
GAP C MOA	B-1	2.2		0.00	0.03	0.44	0.24	0.06	0.06	97.39	0.00	0.00	98.42
	B-52	0.0		0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-
	Tankers [1]	0.0		0	0	0	0	0	0	-	-	-	-
	Transient[2]	0.4		0.00	0.00	0.06	0.02	0.00	0.00	18.51	0.00	0.00	18.70
			TOTAL	***0.01***	***0.03***	***0.51***	***0.26***	***0.06***	***0.06***	**115.89**	**0.00**	**0.00**	**117.13**
			TOTAL	**2.09**	**7.82**	**105.40**	**57.52**	**18.78**	**18.78**	**20,339.70**	**0.57**	**0.66**	**20,556.00**

GHG Alt. B Airfield Emissions

Table 5 - Alternative C Airfield Emissions

AirspaceUnit	Aircraft	*Total Hours*							
				VOC	**CO**	**NO_X**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Powder River 1 MOA	B-1	100		0.17	1.30	20.03	11.01	2.62	2.62
	B-52	30		0.49	1.05	10.69	5.93	3.25	3.25
	Tankers [1]	0		0	0	0	0	0	0
	Transient[2]	4		0.03	0.04	0.65	0.17	0.01	0.01
AirspaceUnit	Aircraft		***TOTAL***	***0.69***	***2.38***	***31.37***	***17.11***	***5.88***	***5.88***
Powder River 2 MOA	B-1	191		0.33	2.49	38.42	21.11	5.03	5.03
	B-52	49		0.80	1.72	17.49	9.70	5.31	5.31
	Tankers [1]	0		0	0	0	0	0	0
	Transient[2]	5		0.03	0.04	0.72	0.19	0.01	0.01
AirspaceUnit	Aircraft		***TOTAL***	***1.16***	***4.25***	***56.63***	***31.00***	***10.36***	***10.36***
Powder River 3 MOA	B-1	93		0.16	1.20	18.60	10.22	2.44	2.44
	B-52	5		0.09	0.19	1.94	1.08	0.59	0.59
	Tankers [1]	0		0	0	0	0	0	0
	Transient[2]	3		0.02	0.03	0.46	0.12	0.01	0.01
AirspaceUnit	Aircraft		***TOTAL***	***0.27***	***1.42***	***21.01***	***11.42***	***3.03***	***3.03***
GAP A MOA	B-1	3		0.01	0.04	0.62	0.34	0.08	0.08
	B-52	0		0.00	0.00	0.00	0.00	0.00	0.00
	Tankers [1]	0		0	0	0	0	0	0
	Transient[2]	1		0.00	0.00	0.09	0.02	0.00	0.00
AirspaceUnit	Aircraft		***TOTAL***	***0.01***	***0.05***	***0.71***	***0.36***	***0.08***	***0.08***
GAP B MOA	B-1	4		0.01	0.05	0.84	0.46	0.11	0.11
	B-52	0		0.00	0.00	0.00	0.00	0.00	0.00
	Tankers [1]	0		0	0	0	0	0	0
	Transient[2]	1		0.01	0.01	0.12	0.03	0.00	0.00
AirspaceUnit	Aircraft		***TOTAL***	***0.01***	***0.06***	***0.97***	***0.50***	***0.11***	***0.11***
			TOTAL	**2.14**	**8.16**	**110.68**	**60.40**	**19.47**	**19.47**

GHG Alt. C Airfield Emissions

			Metric TPY
CO_2	**CH_4**	**N_2O**	**CO_2e**
4,395.18	0.12	0.14	4,441.92
1,310.09	0.04	0.04	1,324.02
-	-	-	-
186.84	0.01	0.01	188.83
5,892.11	**0.17**	**0.19**	**5,954.77**
8,427.69	0.24	0.27	8,517.31
2,143.83	0.06	0.07	2,166.63
-	-	-	-
206.23	0.01	0.01	208.42
10,777.75	**0.30**	**0.35**	**10,892.36**
4,080.98	0.12	0.13	4,124.38
238.40	0.01	0.01	240.93
-	-	-	-
131.32	0.00	0.00	132.71
4,450.70	**0.13**	**0.14**	**4,498.03**
			-
136.17	0.00	0.00	137.61
-	-	-	-
-	-	-	-
25.56	0.00	0.00	25.83
161.72	**0.00**	**0.01**	**163.44**
185.08	0.01	0.01	187.05
-	-	-	-
-	-	-	-
35.25	0.00	0.00	35.63
220.33	***0.01***	***0.01***	***222.67***
21,502.61	**0.61**	**0.70**	**21,731.28**

Notes:

1. Tankers = KC-135
2. Transient: Average Emission Factors B-1, B-2, B-52, KC-135, F-15, F-16

Note (1) CH4 has a GWP of 21 and N2O has a GWP of 310

MJU Flare Emission Factors

Table 15.8.16-1 EMISSION FACTORS FOR THE USE OF DODIC L410,
M206 AIRCRAFT COUNTERMEASURE FLARE - CARBON DIOXIDE, CRITERIA POLLUTANTS,
TOTAL NONMETHANE HYDROCARBONS, AND TOTAL SUSPENDED PARTICULATEa
EMISSION FACTOR RATING: B (except as noted)

CASRNb	Pollutant	lb per item	lb per lb NEWc
124-38-9	CO2	1.10E-02	3.40E-02
630-08-0	Carbon monoxide (CO)	1.30E-03	4.20E-03
--	Oxides of Nitrogen (NOx)	1.30E-04	4.30E-04
--	PM-2.5	6.20E-03	2.00E-02
--	PM-10	6.20E-03	2.00E-02
7446-05-09	Sulfur dioxide (SO2)	7.90E-06	2.60E-05
--	TNMHC	4.00E-04	1.30E-03
12789-66-1	TSPf	8.60E-03	2.80E-02

M206 was used for approximation to MJU Flares

http://www.globalsecurity.org/military/systems/aircraft/systems/m206.htm

Chaff Emission Factor

Source: Air Force. 1997. Environmental Effects of Self-Protection Chaff and Flares.
Prepared for Headquarters Air Combat Command, Langley AFB, Virginia

PM10/PM2.5 EF 95 gm per item

		Chaffs	Flares
Existing	Powder River A MOA	N/A	N/A
	Powder River B MOA	N/A	N/A
	Gateway ATCAA	N/A	N/A
	Black Hills ATCAA	N/A	N/A
	TOTAL	N/A	N/A
Alternative A	Powder River 1 MOA/ATCCA	8249	825
	Powder River 2 MOA/ATCAA	11017	1102
	Powder River 3 MOA/ATCAA	4224	422
	Powder River 4 MOA/ATCAA	5515	552
	Gap A MOA/ATCAA	189	19
	Gap B MOA/ATCAA	257	26
	Gap C MOA/ATCAA	133	13
	Gap B Extension MOA/ATCAA		
	Gateway ATCAA	3416	342
	TOTAL	33,000	3,301
Alternative B	Powder River 1 MOA/ATCCA	4004	400
	Powder River 2 MOA/ATCAA	11489	1149
	Powder River 3 MOA/ATCAA	4574	457
	Powder River 4 MOA/ATCAA	5850	585
	Gap A MOA/ATCAA	131	13
	Gap B MOA/ATCAA	291	29
	Gap C MOA/ATCAA	150	15
	Gap B Extension MOA/ATCAA		
	Gateway ATCAA	3541	354
	TOTAL	*30,030*	*3,002*
Alternative C	Powder River 1 MOA/ATCCA	6055	606
	Powder River 2 MOA/ATCAA	11464	1146
	Powder River 3 MOA/ATCAA	4559	456
	Powder River 4 MOA/ATCAA	3833	383
	Gap A MOA/ATCAA	211	21
	Gap B MOA/ATCAA	287	29
	Gap C MOA/ATCAA	90	9
	Gap B Extension MOA/ATCAA		
	Gateway ATCAA	3531	353
	TOTAL	*30,030*	*3,003*

Table 6 - Alternative A Chaff and Flare Emissions

Emissions by Area (Alternative A) tons/year							
	VOC/TNMHC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Powder River A MOA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Powder River B MOA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gateway ATCAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black Hills ATCAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Powder River 1 MOA/ATCCA	0.33	1.07	0.11	0.01	5.98	5.98	90.74
Powder River 2 MOA/ATCAA	0.44	1.43	0.14	0.01	7.99	7.99	121.19
Powder River 3 MOA/ATCAA	0.17	0.55	0.05	0.00	3.06	3.06	46.46
Powder River 4 MOA/ATCAA	0.22	0.72	0.07	0.00	4.00	4.00	60.67
Gap A MOA/ATCAA	0.01	0.02	0.00	0.00	0.14	0.14	2.08
Gap B MOA/ATCAA	0.01	0.03	0.00	0.00	0.19	0.19	2.83
Gap C MOA/ATCAA	0.01	0.02	0.00	0.00	0.09	0.09	1.46
Gateway ATCAA	0.14	0.44	0.04	0.00	2.48	2.48	37.58
Total (lbs/yr)	**1.32**	**4.29**	**0.43**	**0.03**	**23.92**	**23.92**	**363.00**

Table 7 - Alternative B Chaff and Flare Emissions

Emissions by Area (Alternative B) tons/year							
	VOC/TNMHC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Powder River A MOA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Powder River B MOA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gateway ATCAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black Hills ATCAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Powder River 1 MOA/ATCCA	0.16	0.52	0.05	0.00	2.90	2.90	4.40
Powder River 2 MOA/ATCAA	0.46	1.49	0.15	0.01	8.33	8.33	12.64
Powder River 3 MOA/ATCAA	0.18	0.59	0.06	0.00	3.31	3.31	5.03
Powder River 4 MOA/ATCAA	0.23	0.76	0.08	0.00	4.24	4.24	6.44
Gap A MOA/ATCAA	0.01	0.02	0.00	0.00	0.09	0.09	0.14
Gap B MOA/ATCAA	0.01	0.04	0.00	0.00	0.21	0.21	0.32
Gap C MOA/ATCAA	0.01	0.02	0.00	0.00	0.11	0.11	0.17
Gateway ATCAA	0.14	0.46	0.05	0.00	2.57	2.57	3.89
Total (lbs/yr)	**1.20**	**3.90**	**0.39**	**0.02**	**21.76**	**21.76**	**33.02**

Table 8 - Alternative C Chaff and Flare Emissions

Emissions by Area (Alternative C) tons/year							
	VOC/TNMHC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Powder River A MOA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Powder River B MOA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gateway ATCAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black Hills ATCAA	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Powder River 1 MOA/ATCCA	0.24	0.79	0.08	0.00	4.39	4.39	6.67
Powder River 2 MOA/ATCAA	0.46	1.49	0.15	0.01	8.31	8.31	12.61
Powder River 3 MOA/ATCAA	0.18	0.59	0.06	0.00	3.30	3.30	5.02
Powder River 4 MOA/ATCAA	0.15	0.50	0.05	0.00	2.78	2.78	4.21
Gap A MOA/ATCAA	0.01	0.03	0.00	0.00	0.15	0.15	0.23
Gap B MOA/ATCAA	0.01	0.04	0.00	0.00	0.21	0.21	0.32
Gap C MOA/ATCAA	0.00	0.01	0.00	0.00	0.07	0.07	0.10
Gateway ATCAA	0.14	0.46	0.05	0.00	2.56	2.56	3.88
Total (lbs/yr)	**1.20**	**3.90**	**0.39**	**0.02**	**21.76**	**21.76**	**33.03**

Table 9 - State Airfield Allocations

Powder River A MOA/ATCCA		3,047.04
Montana	87%	
N. Dakota	0%	
S. Dakota	13%	
Wyoming	0%	
	Total	100%
Powder River B MOA/ATCAA		1384.81
Montana	36%	
N. Dakota	0%	
S. Dakota	5%	
Wyoming	59%	
	Total	100%

Powder River 1 MOA/ATCCA		10,915.01
Montana	85%	
N. Dakota	0%	
S. Dakota	0%	
Wyoming	15%	
Powder River 2 MOA/ATCAA		8212.13
Montana	62%	
N. Dakota	0%	
S. Dakota	19%	
Wyoming	19%	100%
Powder River 3 MOA/ATCAA		4530.66
Montana	37%	
N. Dakota	50%	
S. Dakota	13%	
Wyoming	0%	100%
Powder River 4 MOA/ATCAA		5484.90
Montana	0%	
N. Dakota	57%	
S. Dakota	43%	
Wyoming	0%	100%
Gap A MOA/ATCAA		1047.94
Montana	75%	
N. Dakota	25%	
S. Dakota	0%	
Wyoming	0%	100%
Gap B MOA/ATCAA		1210.10
Montana	72%	
N. Dakota	0%	
S. Dakota	28%	
Wyoming	0%	100%
Gap C MOA/ATCAA		3163.26
Montana	0%	
N. Dakota	10%	
S. Dakota	90%	
Wyoming	0%	100%

Table 10 Baseline Emissions (tons/year)										
	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Montana	0.24	1.72	26.58	14.54	3.45	3.45	5,875.48	0.17	0.19	5,937.97
North Dakota	-	-	-	-	-	-	-	-	-	-
South Dakota	0.03	0.25	3.80	2.08	0.49	0.49	839.96	0.02	0.03	848.89
Wyoming	0.11	0.81	12.59	6.92	1.65	1.65	2,807.74	0.08	0.09	2,837.60
Total (tpy)	**0.38**	**2.78**	**42.96**	**23.53**	**5.59**	**5.59**	**9,523.18**	**0.27**	**0.31**	**9,624.45**

Table 11 Annual Emissions from the Proposed Training Alternative A (tons/year)										
	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Montana	1.39	5.04	67.21	36.70	12.25	12.25	12,992.47	0.36	0.37	12,941.45
Net Change from Existing Conditions	1.15	3.32	40.63	22.16	8.80	8.80	7,116.98	0.20	0.18	7,003.48
North Dakota	0.52	2.03	27.73	15.12	4.79	4.79	5,492.65	0.15	0.18	5,492.03
Net Change from Existing Conditions	0.52	2.03	27.73	15.12	4.79	4.79	5,492.65	0.15	0.18	5,492.03
South Dakota	0.54	1.97	26.28	14.34	4.79	4.79	5,068.87	0.14	0.15	5,060.14
Net Change from Existing Conditions	0.51	1.73	22.48	12.26	4.30	4.30	4,228.91	0.12	0.12	4,211.25
Wyoming	0.54	1.08	14.15	7.74	2.67	2.67	2,686.87	0.07	0.07	2,675.02
Net Change from Existing Conditions	0.43	0.26	1.57	0.83	1.02	1.02	(120.87)	(0.00)	(0.02)	(162.57)
NEPA Significance Thresholds	100	100	100	100	100	100	N/A	N/A	N/A	N/A
Total (tpy)	**2.6**	**7.3**	**92.4**	**50.4**	**18.9**	**18.9**	**16,717.68**	**0.46**	**0.46**	**16,544.19**

Table 12 Annual Emissions from the Proposed Training Alternative B (tons/year)										
	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Montana	0.81	3.05	41.12	22.45	7.32	7.32	7,950.57	0.22	0.26	8,025.01
Net Change from Existing Conditions	0.57	1.33	14.54	7.91	3.87	3.87	2,075.09	0.06	0.07	2,087.05
North Dakota	0.52	2.05	28.08	15.30	4.83	4.83	5,520.23	0.16	0.18	5,572.68
Net Change from Existing Conditions	0.52	2.05	28.08	15.30	4.83	4.83	5,520.23	0.16	0.18	5,572.68
South Dakota	0.55	1.99	26.52	14.46	4.82	4.82	5,071.12	0.14	0.16	5,118.94
Net Change from Existing Conditions	0.52	1.74	22.72	12.38	4.33	4.33	4,231.16	0.12	0.14	4,270.05
Wyoming	0.21	0.74	9.69	5.30	1.82	1.82	1,822.37	0.05	0.06	1,839.37
Net Change from Existing Conditions	0.10	(0.08)	(2.90)	(1.61)	0.17	0.17	(985.37)	(0.03)	(0.03)	(998.22)
NEPA Significance Thresholds	100	100	100	100	100	100	N/A	N/A	N/A	N/A
Total (tpy)	**1.72**	**5.04**	**62.44**	**33.98**	**13.20**	**13.20**	**10,841.11**	**0.31**	**0.35**	**10,931.55**

Table 13 Annual Emissions from the Proposed Training Alternative C (tons/year)										
	VOC	CO	NO_X	SO_2	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Montana	1.43	5.29	71.15	38.83	12.76	12.76	13,704.88	0.39	0.44	13,834.63
Net Change from Existing Conditions	1.19	3.58	44.57	24.29	9.30	9.30	7,829.40	0.22	0.25	7,896.66
North Dakota	0.14	0.72	10.64	5.78	1.53	1.53	2,259.21	0.06	0.07	2,280.66
Net Change from Existing Conditions	0.14	0.72	10.64	5.78	1.53	1.53	2,259.21	0.06	0.07	2,280.66
South Dakota	0.26	1.00	13.70	7.48	2.38	2.38	2,679.51	0.08	0.09	2,704.84
Net Change from Existing Conditions	0.22	0.76	9.90	5.40	1.89	1.89	1,839.55	0.05	0.06	1,855.96
Wyoming	0.32	1.14	15.20	8.31	2.80	2.80	2,883.85	0.08	0.09	2,911.15
Net Change from Existing Conditions	0.21	0.33	2.61	1.39	1.15	1.15	76.11	0.00	0.00	73.55
NEPA Significance Thresholds	100	100	100	100	100	100	N/A	N/A	N/A	N/A
Total (tpy)	**1.76**	**5.38**	**67.72**	**36.87**	**13.88**	**13.88**	**12,004.27**	**0.34**	**0.39**	**12,106.83**

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APPENDIX K
SPECIAL-STATUS PLANT AND ANIMAL SPECIES AND SCIENTIFIC NAMES

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Appendix K Special-Status Plant and Animal Species and Scientific Names

Species of Special Concern[1] known to occur under the Proposed Airspace and Their Counties of Occurrence

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
Birds							
American bittern	*Botaurus lentiginosus*	All counties			Crook	FSR2	Seasonal or semi-permanent wetlands
American dipper	*Cinclus mexicanus*		Lawrence, Meade		Sheridan?		Fast, clear, cold mountain streams
American white pelican	*Pelicanus erythrorhynchos*	passage migrant			Not on SOC list		Lakes, marshes, rivers
Baird's sparrow	*Ammodramus bairdii*	Bowman			Campbell	BLM	Native mixed-grass prairie
Bald eagle	*Heliaetus leucocephalus*	Morton, Slope	Lawrence, Meade, Ziebach	Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure	Sheridan, Campbell	D, FWS SOC	Riparian and lacustrine
Black-backed woodpecker	*Picoides arcticus*			Powder River	Crook, Westin?	FSR2	Early successional burned forest of mixed conifer
Black-billed cuckoo	*Coccyzus erythropthalmus*	All counties			Crook, Campbell, Sheridan		Woodlands, thickets, prairie shrubs, wooded urban areas
Black tern	*Chlidonias niger*			Carter	Not on SOC list	FSR2	Wetlands, marshes, small ponds
Burrowing owl	*Speotyto cunicularia*			All counties	All counties	FSR2, BLM	Open grasslands, associated with animal burrows

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
Chestnut-collared longspur	*Calcarius ornatus*	All counties			Campbell, Crrok, Westin	FSR2	Shortgrass prairies
Common loon	*Gavia immer*				Crook, Sheridan	FSR4	Clear, secluded mid-elevational lakes >4 acres
Ferruginous hawk	*Buteo regalis*	All counties			All counties	FSR2, BLM	Native grasslands and shrublands
Grasshopper sparrow	*Ammodramus savannarum*	All counties			All counties	FSR2	Lightly-grazed mixed-grass prairie, meadows, hayfields
Horned grebe	*Podiceps auritus*	passage migrant			Not on SOC list		Open water
Lark bunting	*Calamospiza melanocorys*	All counties			Dropped from Watch List		Sagebrush/sage prairie, 2ndary mixed-grass with dispersed shrubs
Long-billed curlew	*Numenius americanus*	Golden Valley, Bowman, Sioux, Slope		All counties	Campbell, Crook, Sheridan?, Westin	FSR2, BLM	Short-grass prairie or grazed mixed-grass
Marbled godwit	*Limosa fedoa*	All Counties			Not on SOC list		Wetlands, streams, lakes, native prairie often heavily grazed
Mountain plover	*Charadrius montanus*			Big Horn, Treasure	Campbell, Crook, Westin	FSR2	Prairie dog colonies, shortgrass prairies
Northern goshawk			{Black Hills area}	All counties	Crook, Sheridan	BLM, FSR2, FSR4	Coniferous and aspen forests in mid-altitudes
Osprey	*Pandion haliaetus*		Lawrence		All counties		Near large rivers and lakes
Sprague's pipit	*Anthus spragueii*	Bowman, Golden Valley,			Not on SOC list		Ungrazed or lightly-grazed prairie

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
		Morton, Slope					
Swainson's hawk	*Buteo swainsoni*	All Counties			Dropped from Watch List		prairies
Upland sandpiper	*Bartramia longicauda*	Grant, Hettinger, Morton			Dropped from SOC List		Dry, open mixed-grass prairie
Western yellow-billed cuckoo	*Coccyzus americanus americanus*	--	Lawrence?	Rare – Rosebud? Custer?	Rare - Crook, Sheridan	C	Cottonwood – riparian areas
Willet	*Tringa semipalmata*	All counties			Not on SOC list		Wetlands, uplands; native prairies
Wilson's phalarope	*Phalaropus tricolor*	All counties			Dropped from SOC List		Shallow wetlands or mudflats
Mammals							
Black-tailed prairie dog	*Cynomys ludovicianus*	Bowman		All counties	All counties	Under current status review; FSR2	Short grass grazed rangeland
Meadow jumping mouse	*Zapus hudsonius*			All counties except Treasure?	Bear Lodge subsp in Crook, Westin		Dense, tall, lush grasses in marshy areas, riparian upland slopes within ponderosa pine
Pallid bat	*Antrozous pallidus*			Big Horn, Treasure, Powder River, Rosebud	Not on SOC list		Ponderosa pine and big sagebrush with rock outcrops
River otter	*Lutra canadensis*		Meade		Sheridan?	FSR2	Rivers
Spotted bat	*Euderma maculatum*			Big Horn, Treasure	Not on SOC list	FSR2, FSR4, BLM	Open, arid habitats close to tall cliffs

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
Swift fox	*Vulpes velox*		Corson, Perkins, Butte		Crook?, Campbell, Westin	FSR2, BLM	Shortgrass prairies
Townsend's big-eared bat	*Corynorhinus townsendii*			All counties	Potentially all counties?	BLM, FSR2, FSR4	Caves and abandoned mines nears conifer and bottomland woodlands
Fish							
Blue sucker	*Cycleptus elongates*	Morton, Sioux		Rosebud?, Custer?	Not on SOC list		Swift current turbid rivers w/ rocky or gravel bottoms
Burbot	*Lota lota*			Powder River, Custer, Rosebud, Big Horn	Not on SOC list		Large rivers and cold, deep lakes and reservoirs
Longnose sucker	*Catostomus catostomus*		Butte, Meade		Not on SOC list		Clear, cold, deep water of lakes and tributary streams
Northern redbelly dace	*Phoxinus eos*		Corson		Not on SOC list		Quiet waters from beaver ponds, bogs and clear streams
Paddlefish	*Polyodon spathula*			Rosebud, Custer	Not on SOC list		Large rivers
Sauger	*Stizostedion canadense*			All counties	Campbell, ,Sheridan		Large turbid rivers and shallow turbid lakes
Sturgeon chub	*Macrhybopsis gelida*	Bowman, Golden Valley, Slope	Harding, Zeibach	Powder River, Custer	Campbell, Sheridan	FSR2	Turbid rivers w/ sand or gravel bottoms
Yellowstone cutthroat trout	*Oncorhynchuys clarki bouvieri*			Big Horn	Sheridan	FSR2, BLM	Clear, cold streams, rivers and lakes
Amphibians and Reptiles							

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
False map turtle	*Graptemys pseudogeographica*		Corson		Not on SOC list		Slow portion of larger rivers
Milksnake	*Lampropeltis triangulum*			Big Horn, Treasure, Rosebud, Custer, Powder River	Not on SOC list		Open sagebrush grasslands, ponderosa pine, rocky outcrops and hillsides
Northern leopard frog	*Rana pipiens*			All counties	All counties	FSR2, BLM	Low-elevation and valley bottom ponds, lakes, creeks, springs, marshes.
Plains spadefoot	*Spea bombifrons*	All counties			Not on SOC list		Dry grasslands
Smooth green snake	*Liochlorophis vernalis*	All counties			Crook, Westin		grasslands
Snapping turtle	*Chelydra serpentina*			All counties	Not on SOC list		Major rivers, smaller reservoirs and streams with sandy or muddy bottoms
Spiny softshell	*Apalone spinifera*			Big Horn, Treasure, Rosebud, Custer	Campbell, Crook?, Sheridan, Westin?		Large rivers and tributaries
Western hog-nosed snake	*Heterodon nasicus*	All counties		All counties	Not on SOC list		Sandy or gravelly habitats, often by rivers
Plants							
Alderleaf mountain-mahogany	*Cercocarpus montanus*			Treasure			Open slopes and breaks on the plains
American trailplant	*Adenocaulon bicolor*				Crook		Moist, shady birch/hazelnut woods
Blue toadflax	*Nuttallanthus texanus*			Carter			Shale soils of

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
							grasslands and woodlands on the plains
Bractless hedge-hyssop	*Gratiola ebracteata*			Yellowstone			Dry mud around ponds in foothills and plains
Bractless mentzelia	*Mentzelia nuda*			Custer, Powder River, Rosebud			Sandy or gravelly soil of open hills and roadsides
Bur oak	*Quercus macrocarpa*			Carter			Co-dominant with Rocky Mtn. juniper and ponderosa pine or with green ash.
Cottongrass bulrush	*Scirpus cyperinus*				Crook		Wet low ground
Desert groundsel	*Senecio eremophilus*			Big Horn			Streambanks and riparian forests
Dwarf scouring rush	*Equisetum scirpoides*				Crook		Shaded, damp, moss-covered rocks along streams in white spruce and fir woods.
Foxtail sedge	*Carex alopecoidea*				Crook		Wet meadows and willow-sedge communities
Large flowered beardtongue	*Penstemon grandiflorus*			Custer			Sandy soil of valleys on the plains
Letterman's needlegrass	*Stipa lettermanii*			Big Horn			Limestone talus and dry fescue grasslands
Marsh muhly	*Muhlenbergia glomerata*				Crook		Limestone talus and dry fescue grasslands
Nannyberry	*Viburnum lentago*			Big Horn			Openings in riparian forests in the plains.
Narrowleaf milkweed	*Asclepias stenophylla*			Carter, Rosebud			Openings in riparian forests in the plains

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
Narrowleaf penstemon	*Penstemon angustifolius*			Carter, Fallon			Sandy prairie grasslands
Nine-antherdalea	*Dalea enneandra*			Big Horn, Custer, Fallon			Gravelly-soiled grasslands on the plains
Nuttall desert-parsley	*Lomatium nuttallii*			Big Horn, Rosebud			Open, rocky pine woodlands in mid to lower elevation.
Ovalleaf milkweed	*Asclepias ovalifolia*			Carter			Open pine woodlands, prairies and dry riparian terraces
Persistent-sepal yellow-cress	*Rorippa calycina*			Big Horn, Custer, Rosebud, Treasure, Yellowstone			Moist sandy to muddy banks of streams, ponds, reservoirs near high water line.
Prairie aster	*Aster ptarmicoides*			Carter			Open, dry grasslands on sandy or limestone plains
Prairie moonwort	*Botrychium campestre*				Crook		Prairies, dunes, and fields over limestone
Pregnant sedge	*Carex gravida*			Big Horn, Carter, Powder River, Rosebud			Green ash ravines and wooded draws
Sand cherry	*Prunus pumila*			Fallon			Sandy or rocky soils in grasslands on the plains.
Scribner's panic grass	*Dichanthelium oligosanthes var. scribnerianum*			Powder River			Sandy pinelands and wooded draws will well-drained soils.
Silky prairie clover	*Dalea villosa*			Powder			Sandy soils of

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
				River			prairies and woodlands
Slender wedgegrass	*Sphenopholis intermedia*			Carter			Wet areas in valleys or foothills
Slender-branched popcorn-flower	*Plagiobothrys leptocladus*			Big Horn			Drying mud on shores of ponds in plains and foothills.
Smooth goosefoot	*Chenopodium subglabrum*			Custer			Loose, sandy soils in early successional sparsely vegetated habitats.
Spotted Joe pye-weed	*Eupatorium maculatum*			Carter, Custer, Powder River, Yellowstone			Moist meadows, springs, swamp thickets
Sweetwater milkvetch	*Astragalus aretioides*			Big Horn			Exposed ridges & slopes often in opening of Douglas fir
Trailing clubmoss	*Lycopodium complanatum*				Crook		Semi-shady white spruce/paper birch forest
Treelike clubmoss	*Lycopodium dendroideum*				Crook		Moist coniferous forests
Visher's buckwheat	*Eriogonum visheri*			Carter			Barren rock outcrops or clay outwash
White-bract stickleaf	*Mentzelia montana*			Custer			Grasslands and sparsely vegetated slopes in the plains.
Woolly twinpod	*Physaria didymocarpa var. lanata*			Big Horn, Rosebud			Sandy open grasslands or shrubland slopes in plains

Common Name	Scientific Name	Project Area States and Counties of Known Occurrence				FED[2]	Habitat
		ND	SD	MT	WY		
Wyoming thistle	*Cirsium pulcherrimum*			Powder River			Sparsely-vegetated soils of washes and gullies.
Yellow bee plant	*Cleome lutea*			Big Horn			Open sandy sagebrush steppe

(Sources: MTFWP 2005; MTNHP 2007; Hagen et al. 2005; Nature Serve 2007; SDGFP 2008; SDGFP 2002; SDB 2008; WYGF 2005; Fertig et al. 1994; WYNDD 2003)

[1] WYNDD describes these as plants and animals that are rare, endemic, disjunct, threatened, or otherwise biologically sensitive or are vulnerable to extirpation at the global or state level. SOC = species of concern. Counties with question marks (?) were unverified by the source.

[2] D = delisted under ESA; C = candidate for federal listing; BLM = BLM Sensitive; FSR_ = USFWS Sensitive and Region

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APPENDIX L
LETTERS OF AGREEMENT

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LETTER OF AGREEMENT

Effective: December 10, 2006

SUBJECT: POWDER RIVER TRAINING COMPLEX AND CROSSBOW ATCAA

1. PURPOSE: This Letter of Agreement defines areas, responsibilities, and procedures for the Powder River "A" and "B" Military Operations Areas (MOA), the Powder River Air Traffic Control Assigned Airspace (ATCAA), the Gateway ATCAA, the Black Hills ATCAA, and the Crossbow ATCAA, among Denver Air Route Traffic Control Center (Center), Salt Lake City Air Route Traffic Control Center (Center), and the 28th Bomb Wing, Ellsworth Air Force Base, South Dakota.

2. BACKGROUND: The 28th Bomb Wing (28 BW) has the operational requirement to perform high and low altitude training with, and without, support from the Belle Fourche Electronic Scoring Site located within the Powder River Training (PRT) Complex. Composite and multi-force exercises are also performed in the PRT Complex. The Crossbow ATCAA airspace redesign was developed to allow training aircraft to use only a small block of airspace needed for the exercise. It is not intended for use of large altitude blocks.

3. CANCELLATION: This agreement cancels the Letter of Agreement (LOA) among Denver Center, Salt Lake City Center, and the 28th Bomb Wing, Powder River Training Complex and Crossbow ATCAA, dated June 12, 2005.

4. SCOPE:

a. The provisions of this agreement are applicable to Denver Center, Salt Lake City Center, and the 28 BW and are supplemental to FAA Order 7610.4, Special Military Operations, and FAA Order 7110.65, Air Traffic Control, and appropriate military regulations. The provisions of this agreement may be canceled or amended by any one signatory notifying the others through written coordination.

b. The MOAs and ATCAAs are depicted in Attachments 1 through 4. The altitudes designated are described as follows:

(1) Powder River “A” MOA – Surface up to, but not including, FL180.

(2) Powder River “B” MOA – 1,000 feet AGL up to, but not including, FL180.

(3) Powder River ATCAA – FL180 to FL260 inclusive, or as assigned.

(4) Gateway ATCAA – FL180 to FL260 inclusive, or as assigned.

(5) Black Hills ATCAA – FL200 to FL230 inclusive.

(6) Crossbow ATCAA – FL270 to FL450 inclusive, or as assigned. (See paragraph 6b(7) for non-usable times and intended use of airspace.)

c. The Powder River “A” MOA, Powder River “B” MOA, Powder River ATCAA, Gateway ATCAA, and Black Hills ATCAA are all parts of the PRT Complex. Reference to the PRT Complex may include any one area or combinations of areas. The Crossbow ATCAA is not part of the PRT Complex.

5. RESPONSIBILITIES:

a. The 28 BW shall:

(1) Be the scheduling agency.

(2) Be responsible for the overall airspace management of the airspace within the complex.

(3) Ensure that all participating aircrews are familiar with and adhere to the provisions of this agreement.

b. Salt Lake City Center is the controlling agency for the Powder River "A" MOA.

c. Denver Center is the controlling agency for:

(1) Powder River "B" MOA.

(2) Powder River ATCAA.

(3) Gateway ATCAA.

(4) Black Hills ATCAA.

(5) Crossbow ATCAA.

6. PROCEDURES: Unless otherwise coordinated:

a. Time Conversion. The symbol ‡ indicates that during periods of Daylight Savings Time, effective hours will be 1 hour earlier than shown.

b. Airspace Coordination.

(1) The 28 BW shall ensure that the Denver Center Military Coordinator (MC) and the Salt Lake City Center MC receive the daily schedule for the planned activity in the PRT Complex and/or the Crossbow ATCAA by 2200Z‡ (1500 local), the day prior, for the next 24-hour period that starts at 0700Z‡ (0000 local). All changes and/or modifications to the schedule shall be coordinated at least 2 hours in advance.

(2) Only the airspace, time period, and altitude blocks needed to accomplish the desired maneuvers shall be requested.

(3) When cleared to operate in the Crossbow ATCAA at and above FL270, aircrews shall maintain a listening watch on Denver Center frequency 133.67/322.5. Should it become necessary for Denver Center or Salt Lake City Center to recall the airspace at and above FL270, it is expected that the aircrews will be able to return the airspace within a maximum of 30 minutes.

NOTE: Salt Lake City Center should coordinate with Denver Center MC position for recall of airspace at and above FL270.

(4) The 28 BW airspace manager shall provide Denver Center and Salt Lake City Center a current telephone list of personnel to contact in the event either Center must recall or restrict the use of scheduled airspace. If either Center recalls or restricts the use of scheduled airspace, they shall inform the other Center as soon as practicable.

(5) The Powder River "A" and "B" MOAs shall be scheduled simultaneously, not separately.

(6) “Time of Use” for the Powder River "A" and "B" MOAs are “Intermittent by NOTAM.”

(7) The Crossbow ATCAA is not usable at and above FL270 between 1500-1800Z‡ (0800-1100 local) and 2130-2330Z‡ (1430-1630 local) daily. The airspace will be given in block altitudes of 1000 feet per aircraft (i.e., A flight of two aircraft will generally be approved for a 2000 foot block). When a climb from lower altitude is required within the lateral confines of the ATCAA, an expanded block may be temporarily granted by the controller until the formation is established within the requested block.

(8) Scheduling of the Powder River MOAs are predicated on the procedures in paragraph 6b(1) and (4); however, the areas are not released to the user until the pilot(s) have received a clearance into the area by Denver Center or Salt Lake City Center.

NOTE: If an aircraft is scheduled to enter the Powder River MOAs via a Military Training Route (MTR), the pilot shall request clearance into the MTR and the Powder River MOA simultaneously. Entry into the Powder River MOA is not automatic with the MTR clearance.

(9) The Black Hills ATCAA will only be used for marshalling or aerial refueling for multi-force exercises, in conjunction with the remaining PRT Complex airspace, with at least 3 administrative working days notification to Denver Center.

(10) For aircraft other than on an MTR, each FAA facility is responsible for notifying the other facility whenever participating aircraft have requested entry into the PRT Complex or Crossbow ATCAA. This can be accomplished through the facilities' operations supervisors or from controller to controller.

(11) Denver Center:

For aircraft entering PRT Complex area(s) from RAP308069 (ARCOT) or from RAP326036:

(a) Sector 31 shall coordinate activation, changes of assigned altitude blocks, and deactivation of the PRT Complex area(s) with Salt Lake City Center Sector 17 and the adjacent Minneapolis Center Sector(s), and when appropriate, Sectors 22 and 32.

(b) Sector 32 shall coordinate activation, changes of assigned altitude blocks, and deactivation of the Crossbow ATCAA with Salt Lake City Center Sector 17 and the adjacent Minneapolis Center Sector(s).

(12) Salt Lake City Center:

For aircraft entering PRT Complex area(s) from MLS146037:

(a) Sector 17 shall coordinate activation, changes of assigned altitude blocks, and deactivation of the PRT Complex area(s) with Denver Center Sectors 22 and 31 and the adjacent Minneapolis Center Sector(s), and when appropriate, Denver Center Sector 32.

(b) Sector 17 shall coordinate with Denver Center Sectors 22 and 31 prior to approving altitude changes within the PRT Complex, and with Denver Center Sector 32 prior to approving altitude changes within the Crossbow ATCAA, and shall advise the adjacent Minneapolis Center sector(s) of any altitude changes.

(13) When Denver Center and or Salt Lake City Center grant approval for operations in the Powder River MOAs, air traffic control (ATC) responsibility does not include Class G airspace. The Aeronautical Information Manual, Chapter 3, Section 4, defines ATC and VFR/IFR pilot responsibilities within MOAs.

c. Flight Planning and En Route Procedures.

(1) Flights shall enter the MOAs at 16,000 feet MSL using the standard entry point (ARCOT) when utilizing only the MOAs or when entering below FL180. When entering at or above FL180, flights shall enter within the scheduled ATCAA altitude block.

(2) Two navigation fixes, MLS119074 (LIBON) and RAP301089 (PLAAT), are required as a minimum when flight planning into the PRT Complex and/or the Crossbow ATCAA so that Denver Center and Salt Lake City Center receive proper flight plan information. Two unnamed fix/radial distances and four named fixes have been associated with Fix/Radial/Distance to simplify internal flight planning (see Attachment 2, Powder River ATCAA and Attachment 3, Crossbow ATCAA). They are identified as:

(a)	ARCOT	RAP308069	(44° 51.9' - 104° 01.8') – standard entry fix
(b)	LIBON	MLS119074	(45° 31.1' - 104° 41.5') – navigation fix
(c)	PLAAT	RAP301089	(44° 59.8' - 104° 31.0') – navigation fix
(d)	DRAGG	RAP295077	(44° 45.5' - 104° 25.9') – standard exit fix
(e)		RAP326036	(44° 32.0' - 103° 19.0') – southeast entry/exit fix
(f)		MLS146037	(45° 48.0' - 105° 40.0') – northwest entry/exit fix

(3) The aircraft shall file using the following format at a minimum (entry to exit): ..ARCOT..LIBON..PLAAT/D(hr)+(min)..DRAGG.. Other entry and exit fixes may be used prior to and after this required format.

Example:
..MLS146037..ARCOT..LIBON..PLAAT/D(hr)+(min)..DRAGG..RAP326036..

(4) Flight plan "Remarks" should include the airspace, entry and exit times, and MARSA, if appropriate.

(5) It shall be the responsibility of each pilot cleared to operate in the addressed airspace to remain within the confines of the airspace and to remain on the assigned Denver Center or Salt Lake City Center frequency unless approved to change frequency for a specified period of time. Radio communications are severely reduced below 16,000 feet MSL in the Powder River area.

NOTE: See Attachment 5 for communications frequencies of interest for the PRT Complex and the Crossbow ATCAA.

(6) Military Authority Assumes Responsibility for Separation of Aircraft (MARSA) shall apply between participating aircraft while operating in the PRT Complex and the Crossbow ATCAA and aircraft operating on MTRs that traverse the MOAs.

(7) Pilots shall use the current Rapid City, South Dakota, altimeter setting while operating below FL180 and an altimeter setting of 29.92 while operating at and above FL180 within the MOAs/ATCAAs. The altimeter setting shall be issued to participating aircraft as part of the clearance into the Powder River MOAs.

(8) All aircraft proposing to use the defined airspace shall have an operating transponder. The lead aircraft of formation flights shall remain on the assigned discrete beacon code. While operating within the PRT Complex and the Crossbow ATCAA, wingmen not previously assigned a discrete beacon code shall squawk code 4000 after formation breakup. After the aircraft have joined up in formation, and prior to exiting the airspace, wingmen shall squawk standby.

(9) Unless otherwise coordinated, pilots shall operate into and out of the PRT Complex on an IFR flight plan. Aircraft requesting to depart the airspace VFR are responsible for notifying either Denver Center or Salt Lake City Center, as appropriate.

(10) Stereo flight routes are available for local sorties from Ellsworth AFB.

(a) PRT1: RCA..RAP110060..ARCOT..LIBON..PLAAT/D1+00..DRAGG..RCA

(b) PRT2:
RCA..RAP110060..ARCOT..LIBON..PLAAT/D1+00..DRAGG..RAP179037..
BFF018067..BFF327070..CDR291055.IR499.JAC186035..PIH069090..DDY..
RCA

(c) PRT3:
RCA..RAP152027..RAP336053..RAP285081..RAP273070..RAP212070/D0+45
.AR678.RAP199082..RAP345042..ARCOT..LIBON..PLAAT/D1+00..DRAGG..
RCA

(d) PRT4:
RCA..RAP110060..ARCOT..LIBON..PLAAT/D1+00..DRAGG..SHR098087..
RAP285081..RAP273070..RAP212070/D0+45.AR678.RAP199082..RCA

(e) PRT5:
RCA..RAP213061..BFF018067..BFF327070..CDR291055.IR499.JAC186035..
PIH069090..DDY..RAP297035..ARCOT..LIBON..PLAAT/D1+00..DRAGG..RCA

d. Exit Procedures.

(1) Aircraft on an MTR shall exit the Powder River area at the expiration of the filed delay time and at an altitude within the published vertical limits of the MTR.

(2) Aircrews should inform ATC of their exit time at least 10 minutes prior to exiting the airspace. All aircraft shall remain within the PRT Complex or the Crossbow ATCAA until an IFR clearance to exit the airspace has been issued by either Denver Center or Salt Lake City Center.

(3) Use of the standard exit point (DRAGG) at 17,000 MSL is expected for aircraft returning directly to Ellsworth AFB; however, the other entry/exit fixes may be used in Class A for flights with follow-on activities or desiring a high approach into Ellsworth.

(4) Pilots shall, when requesting to exit the Powder River MOAs/ATCAA, contact Denver Center on 127.95 or 338.2 MHz, at or below FL260. When exiting the Crossbow ATCAA at and above FL270, pilots shall contact Denver Center on 133.67 or 322.4 MHz. Pilots shall, when exiting the Powder River MOAs/ATCAA at the MLS146037 fix (northwest exit fix), contact Salt Lake City Center on 126.85 or 305.2 MHz.

(5) If there is no contact with Denver Center on frequency 127.95 or 338.2 MHz, attempt contact with Denver Center on 135.6 or 363.02 MHz or Salt Lake City Center on 364.8 MHz (Tactical).

(6) The PRT Complex and Crossbow ATCAA area airspaces are automatically released back to the controlling agencies when the last aircraft has exited the airspace.

7. LOST COMMUNICATIONS:

a. If radio failure occurs before a delay clearance in the PRT Complex or the Crossbow ATCAA is received, follow the procedures specified in CFR part 91.185 and the DOD Flight Information Handbook.

b. If radio failure occurs after the delay clearance has been issued, aircraft shall exit the airspace at the expiration of the delay time.

c. If recovering VFR to Ellsworth AFB, the aircraft shall climb or descend to 15,500 feet MSL prior to departing the area and proceed directly to the Initial Approach Fix for the runway of departure or active runway, if known, and execute the approach in accordance with the procedures specified in the DOD Flight Information Handbook.

d. If recovering IFR to Ellsworth AFB, the aircraft shall climb or descend to 17,000 feet MSL or the lowest altitude of the assigned block, whichever is highest, prior to departing the area and proceed directly to the Initial Approach Fix for the runway of departure or active runway, if known, and execute the approach in accordance with procedures specified in the DOD Flight Information Handbook.

e. If not recovering to Ellsworth AFB, follow the procedures specified in CFR part 91.185 and the DOD Flight Information Handbook.

8. ATTACHMENTS:

a. Attachment 1. Powder River "A" MOA and Powder River "B" MOA.
b. Attachment 2. Powder River ATCAA and Gateway ATCAA.
c. Attachment 3. Crossbow ATCAA.
d. Attachment 4. Black Hills ATCAA and PRT Complex.
e. Attachment 5. Communications Frequencies.

9. APPROVED:

James L. Powell
Air Traffic Manager, Denver Center
Federal Aviation Administration

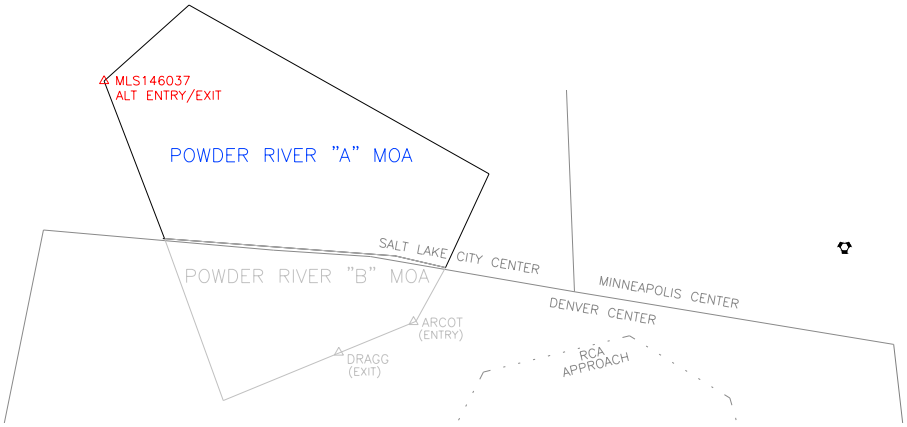
Sherry A. Butler
Air Traffic Manager, Salt Lake City Center
Federal Aviation Administration

Jeffry F. Smith, Colonel, USAF
Commander, 28th Bomb Wing
Ellsworth AFB, South Dakota

Attachment 1

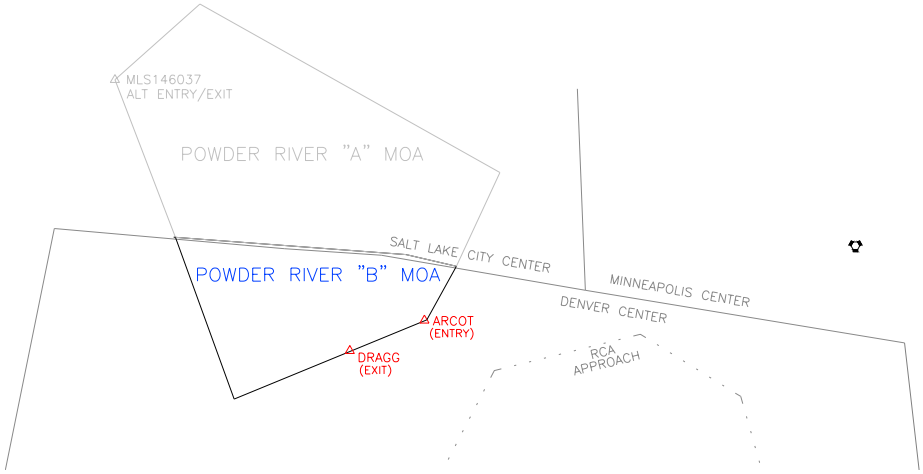
The **POWDER RIVER "A" MOA** is designated from the surface up to, but not including, FL180. The boundaries are:

Beginning at
46°05'00"N - 105°12'02"W (MLS 104036) to 45°25'00"N - 103°36'02"W (RAP 331090) to 45°04'00"N - 103°51'02"W (RAP 318075) to 45°07'00"N - 104°07'02"W (GCC 041076) to 45°12'00"N - 105°21'02"W (GCC 357052) to 45°48'00"N - 105°40'02"W (MLS 146037) to the point of beginning.



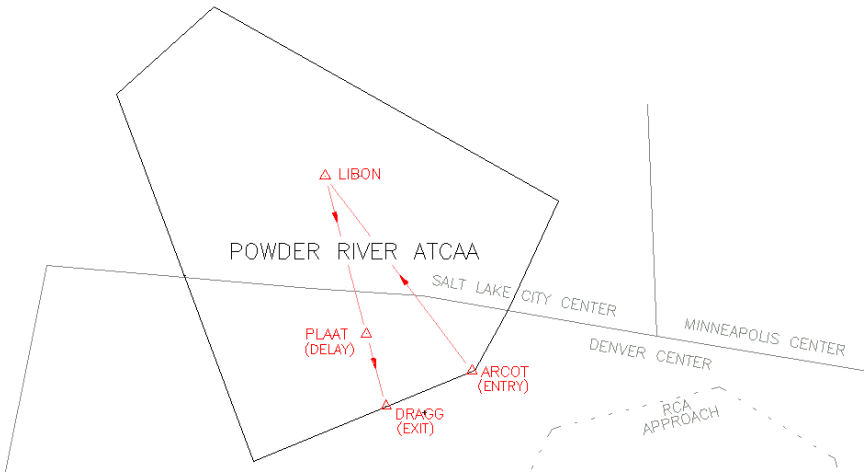
The **POWDER RIVER "B" MOA** is designated from 1,000 feet AGL up to, but not including, FL180. The boundaries are:

Beginning at
45°04'00"N - 103°51'02"W (RAP 318075) to 44°52'00"N - 104°01'02"W (RAP 308069) to 44°35'00"N - 105°03'02"W (GCC 044025) to 45°12'00"N - 105°21'02"W (GCC 357052) to 45°07'00"N - 104°07'02"W (GCC 041076) to the point of beginning.

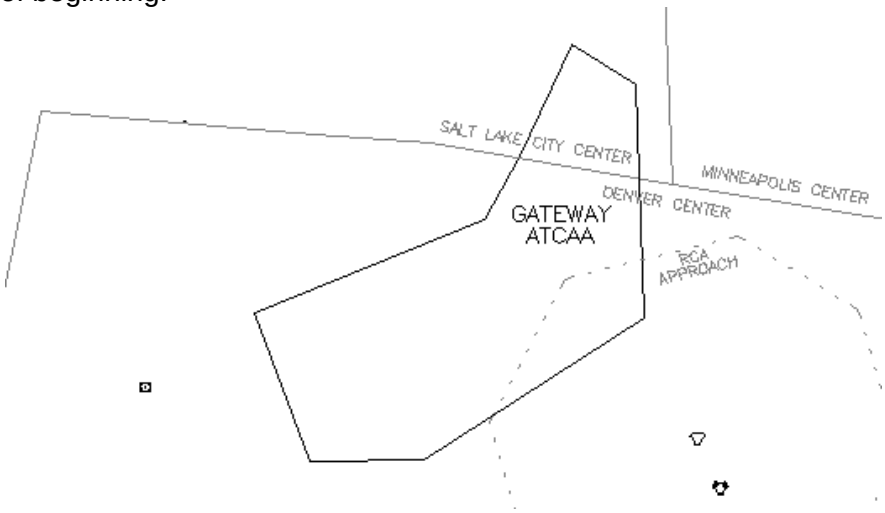


Attachment 2

The POWDER RIVER ATCAA is designated from FL180 through FL260 inclusive, or as assigned. The boundaries are:
Beginning at
46°05'00"N - 105°12'02"W (MLS 104036) to 45°25'00"N - 103°36'02"W (RAP 331090) to
45°04'00"N - 103°51'02"W (RAP 318075) to 44°52'00"N - 104°01'02"W (RAP 308069) to
44°35'00"N - 105°03'02"W (GCC 044025) to 45°48'00"N - 105°40'02"W (MLS 146037) to
the point of beginning.



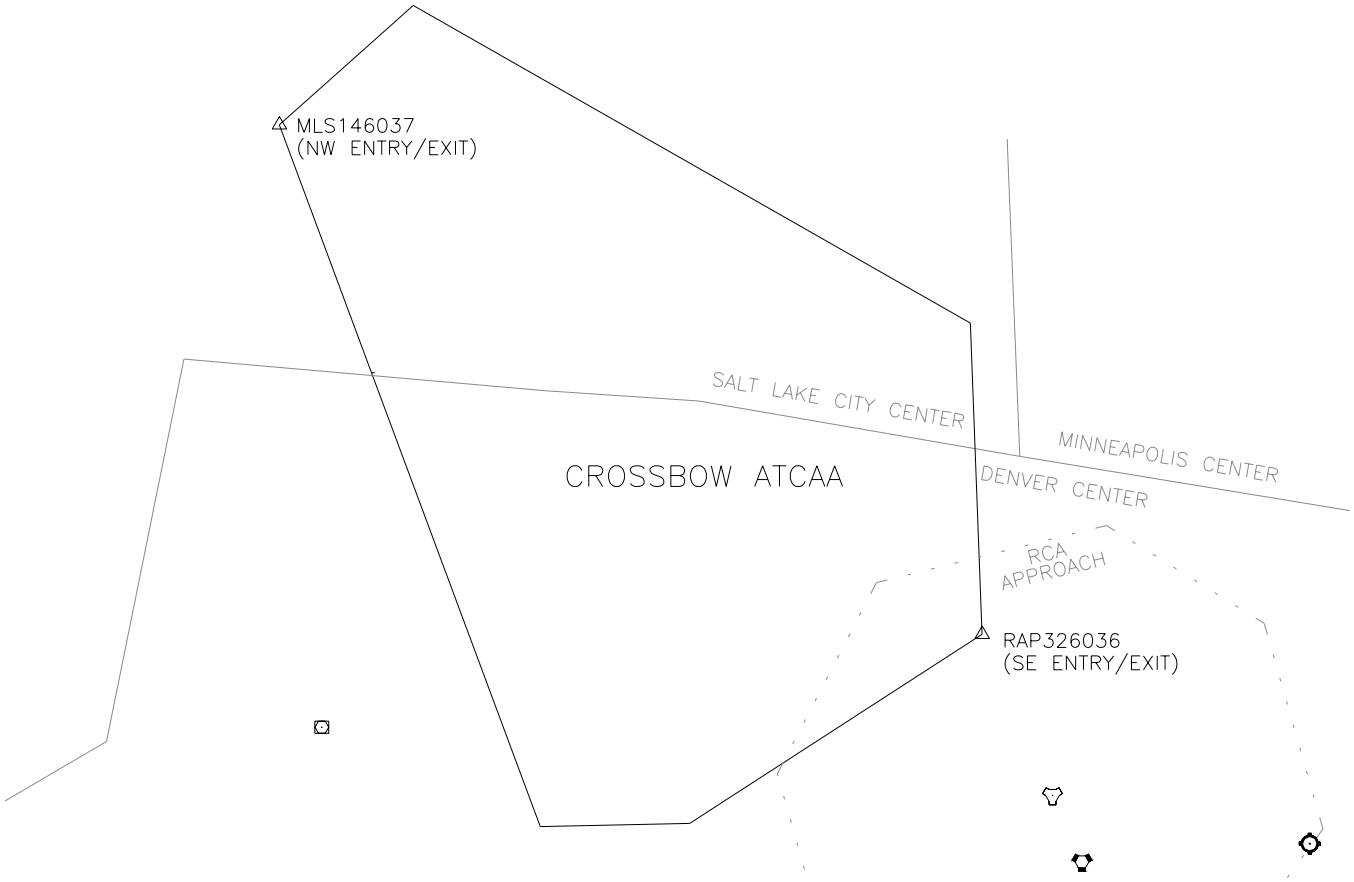
The GATEWAY ATCAA is designated from FL180 through FL260 inclusive, or as assigned. The boundaries are:
Beginning at
44°35'00"N - 105°03'02"W (GCC 044025) to 44°52'00"N - 104°01'02"W (RAP 308069) to
45°04'00"N - 103°51'02"W (RAP 318075) to 45°25'00"N - 103°36'02"W (RAP 331090) to
45°17'00"N - 103°19'02"W (RAP 338080) to 44°32'00"N - 103°19'02"W (RAP 326036) to
44°06'00"N - 104°19'02"W (RAP 265057) to 44°06'00"N - 104°49'02"W (GCC 103035) to
the point of beginning.



Attachment 3

The **CROSSBOW ATCAA** is designated from FL270 through FL450 inclusive, or as assigned. The boundaries are:

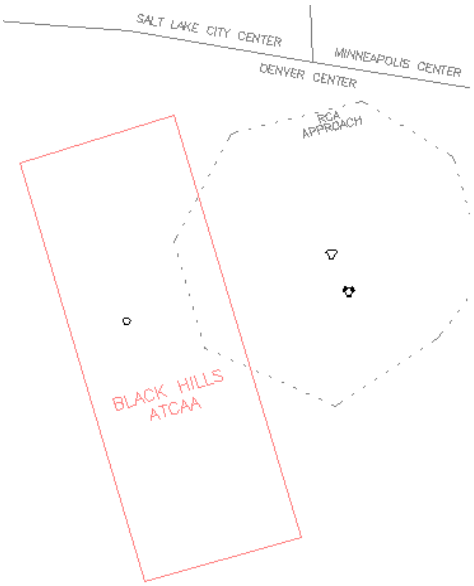
Beginning at
46°05'00"N - 105°12'02"W (MLS 104036) to 45°17'00"N - 103°19'02"W (RAP 338080) to 44°32'00"N - 103°19'02"W (RAP 326036) to 44°06'00"N - 104°19'02"W (RAP 265057) to 44°06'00"N - 104°49'02"W (GCC 103035) to 45°48'00"N - 105°40'02"W (MLS 146037) to the point of beginning.



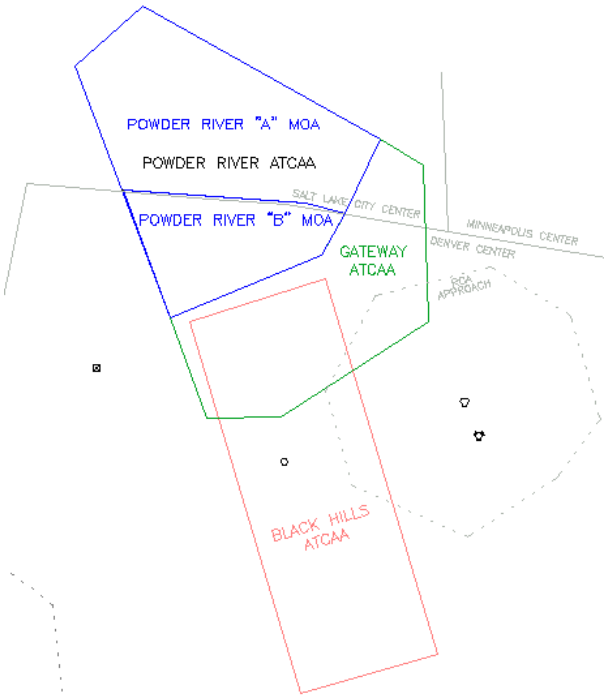
Attachment 4

The **BLACK HILLS ATCAA** is designated from FL200 through FL230 inclusive. The boundaries are:

Beginning at
44°45'06"N - 104°00'00"W (RAP 305063) to 44°33'48"N - 104°54'48"W (RAP 281089) to 42°46'12"N - 104°14'30"W (RAP 204090) to 42°56'12"N - 103°20'24"W (RAP 180064) to the point of beginning.



POWDER RIVER TRAINING COMPLEX



Attachment 5

Communications Frequencies

Note: Radio communications are severely reduced below 16,000 feet MSL in the Powder River area.

Denver Center:

Sector 31, Powder River "B" MOA/ATCAA/Black Hills ATCAA areas below FL260 127.95/338.2 MHz. (If unable use 135.6 or 363.02 MHZ).

Sector 32, Crossbow ATCAA above FL270 133.67/322.5 MHz.

Tactical, 296.7 MHz.

Salt Lake City Center:

Sector 17, Powder River "A" MOA/ATCAA surface and up 126.85/305.2 MHz.

Tactical, 364.8 MHz.

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BLM-MOU- MT925- 1001

MEMORANDUM OF UNDERSTANDING

between
Department of the Interior,
Bureau of Land Management, Montana State Office
and
the United States Air Force 28th Operations Group
Ellsworth Air Force Base, South Dakota
concerning
Airspace Coordination of Powder River Military Operating Area

1. PURPOSE

To provide procedures and guidance for the coordination of aerial operations within Powder River A and B Military Operations Areas hereinafter referred to as PRMOA, between the 28th Operations Support Squadron, (28 0SS) of Ellsworth Air Force Base (AFB), South Dakota hereinafter referred to as 28th OSS, and the Bureau of Land Management (BLM), Miles City Dispatch Center (MCDC), Miles City, Montana hereinafter referred to as MCDC.

2. AUTHORITIES / REFERENCES

Title 14 CFR, Sections 91, 73,
Federal Aviation Administration (FAA) Order JO 7610.4M Special Operations Training Guide
Federal Aviation Order JO7110.65 Air Traffic Control
AFI 25-201, Support Agreements Procedures, 1 May 2005
AFI 10-802, Military Support to Civil Authorities, 19 April 2002
BLM Departmental Manual 9400
Interagency Airspace Coordination Guide
Taylor Grazing Act of June 28, 1924 (48 Stat. 1269; 43 U.S.C. 315)
Federal Land Policy and Management Act of 1976, Sec. 307 (b) (43 U.S.C. 1737)
Federal Wildland Fire Management Policy and Program Review, 1995, 2000

3. SCOPE

This MOU applies to PRMOA airspace managed and controlled by the 28th OSS for joint-use by military aircraft of all service branches.

The MCDC authorities are responsible for conducting and coordinating aerial operations within the PRMOA airspace. All aircraft under BLM operational control shall adhere to Title 14 CFR Parts 91, 133, 137 and this document.

4. ADMINISTRATION

Nothing in this MOU shall obligate the BLM or the United States Air Force to expend appropriations or to enter into any contract or other obligation. Specific work projects or activities that involve the transfer of funds, services, or property between the parties to this MOU will require the execution of separate agreements or contracts, contingent upon the availability of funds as appropriated by Congress. Each subsequent agreement or arrangement involving the transfer of funds, services, or property shall be made in writing and shall be independently authorized by appropriate statutory authority and regulations, including those applicable to procurement activities.

Any records or documents generated as a result of this MOU shall become part of the official BLM record maintained in accordance with applicable BLM Records Management policies. Any request for release of records associated with the implementation of this MOU to anyone outside the parties must be determine based on applicable laws, including the Freedom of Information Act and the Privacy Act. The BLM cannot agree to maintain the confidentiality of information received from the Cooperating Agency except to the extent that it is permitted under the Freedom of Information Act and the Privacy Act.

5. RESPONSIBILITIES

A. The BLM is responsible for the following:

a. MCDC services as the focal point and primary contact for the coordination of all BLM aerial operations to include the issuance and cancellation of Temporary Flight Restrictions (TFRs), Title 14 CFR Section91.193. The BLM shall also be responsible for informing 28th OSS of any TFR changes.

b. Contact 28th OSS, as appropriate, to obtain prior approval for aircraft having an operational need to operate during Wildland fire incidents or other emergency operations within the PRMOA using the National Firefighting transponder Code of 1255.

c. Provide the 28th OSS with the up-to-date information concerning BLM activity within the PRMOA when requested.

d. Initiate the notification process for BLM activities affecting PRMOA in accordance with Flight Information publication (FLIP) AP/1B.

e. The BLM Montana Dakotas State Aviation Manager or assigned agency airspace coordination specialist shall:

1. Be the focal point for resolving difficulties in in scheduling airspace with the 28th OSS.
2. Coordination with 28th OSS Airspace Manager on all conflicts or incidents occurring within PRMOA.
3. Service as the focal point for administrative change sor additiosn to the MOU.

B. The 28th Operations Support Squadron will be responsible for:

a. Ensure TFR information is distributed to all flying unties utilizing the PRMOA.

b. Coordinate routine requests from BLM dispatchers that need to conduct aviation operation within PRMOA with other affected agencies.

c. Provide BLM with the up-too-date schedule information concerning DOD activity within the PRMOA when requested.

d. The Airspace manager at Ellsworth AFB is the Military focal point for administrative changes or additions to this document.

e. Provide BLM with a current copy of the 28 BW "Mid-Air Collision Avoidance (MACA) Program Guide"

6. COORDINATION PROCIEDRUES FOR NON-FIRE OPERATIONS

A. BLM Requirements:

When BLM dispatchers or aviation managers become aware of situations that my necessitate flight within the PRMOA , they shall:

a. Coordinate all BLM aviation operations affecting PRMOA with 28th OSS in a timely manner.

b. A pre-flight briefing of BLM aircrews will include scheduled PRMOA activity.

c. Notify 28th OSS of the completion of all flight activity at the end of each day as appropriate.

B. The 28th OSS, upon notification of BLM proposed aerial operations within PRMOA will:

a. Update military units scheduled for PRMOA, of non-military aviation operations scheduled for simultaneous activity. This advisory will include times, altitudes, and locations of non-military operations as well as a de-confliction plan.

b. Coordinate the current airspace status with MCDC and any scheduled flights for the requested time period.

c. Advise MCDC of any changes in PRMOA status that will not be conducive to joint operations and provide an estimate when operations can begin, or be resumed.

7. COORDINATION PROCEDURES FOR FIRE RESPONSE WITH (TFR): The BLM shall:

a.) Check status of PRMOA airspace using the FAA Special Use Area (SUA) website and confirm with 28th OSS.

b.) Notify 28th OSS of a fire location or upon the request of a TFR within the PRMOA

c.) Request a TFR with the appropriate FAA Air Route Traffic Control Center (ARTCC).

d.) Advise 28th OSS of any modification, changes, or cancellation of the TFR.

8. CANCELLATION OF TFRs

The TFRs will be canceled by BLM through established procedures at the appropriate ARTCC. The MCDC will notify 28th OSS, as appropriate, when air operations for the TFT are complete.

9. INCIDENT /ACCIDENT

In the event of an airspace incident involving BLM and DOD aircraft, the BLM and 28th OSS will notify the other agency immediately.

The BLM and the 28th OSS will follow their standard incident/accident or hazard reporting procedures and coordinate appropriately as needed.

Incidents shall be cooperatively reviewed between the BLM and Ellsworth AFB and reported appropriately.

10. EDUCATION AND AWARENESS

Education and awareness is essential to the mutual efforts to enhance interagency flight safety. Meetings between BLM and USAF personnel are encouraged to foster open communication.

11. POINTS OF CONTACT:

Ellsworth AFB
28th Operations Support Squadron
Scott Drive, Suite 200
Ellsworth AFB, SD 57706-4710

Airspace Manager

Office	605-385-1230
Fax Unclassified	605-685-1241
After hours	605-431-3580

28th OSS Scheduling

Office	605-352-4746
After hours	605-431-3025

BLM Aviation Management

Montana Dakotas Aviation Office
Aviation Officer
1299 Rim Top Drive
Billings, MT 59105
Work: 406-896-2912

BLM Miles City Fire Operations Zone
111 Garryowen Road
Miles City, MT 59301

Unit Aviation Officer
Work: 406-233-2909

Miles City Dispatch Center

Dispatch Office

Normal Hours	406-233-2900
After Hours	406-233-0148
Fax	406-233-2945

Center Manager

Office	406-233-2905

Aircraft Dispatcher

Office	406-233-2908

12. APPROVALS / SIGNATURES

Approved _____ Oct 7, 2009
GENE TERLAND
Montana/Dakotas BLM State Director
Date

Approved _____ 22SEP09
WILLIAM G. ELDRIDGE, Colonel, USAF
Commander, 28th Operations Group, Ellsworth AFB, SD
Date

APPENDIX M
SECTION 106 CORRESPONDENCE

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Section 106 Correspondence		
Recipient	***From***	***Date***
Rick Wolfname, President Northern Cheyenne Tribal Council	Department of the Air Force – Ellsworth 28 BW ACC	15 February 08
Joseph Brings Plenty, Chairman Cheyenne River Sioux Tribe	Department of the Air Force – Ellsworth 28 BW ACC	15 February 08
Ron His Horse Is Thunder Standing Rock Sioux Tribal Council	Department of the Air Force – Ellsworth 28 BW ACC	15 February 08
Carl Venne, Chairman Crow Tribal Council	Department of the Air Force – Ellsworth 28 BW ACC	15 February 08
Kathleen Burrage Crow Nation Office of Legal Council	Department of the Air Force – HQ ACC-A7PP	12 June 2008
Clara Claufield Northern Cheyenne Tribal Administrative Offices	Department of the Air Force – HQ ACC-A7PP	12 June 2008
Donald Red Thunder Land Operations Office Cheyenne River Agency	Department of the Air Force – HQ ACC-A7PP	12 June 2008
Richard Bird Chairman, Economic Committee Standing Rock Agency	Department of the Air Force – HQ ACC-A7PP	12 June 2008
Chairman Joseph Brings Plenty Cheyenne River Sioux Tribal Council	Department of the Air Force – HQ ACC-A7PP	12 June 2008
Bureau of Indian Affairs Standing Rock Agency	Department of the Air Force – HQ ACC-A7AP	03 June 2008
Bureau of Indian Affairs Cheyenne River Agency	Department of the Air Force– HQ ACC-A7AP	03 June 2008
Bureau of Indian Affairs Pine Ridge Agency	Department of the Air Force– HQ ACC-A7AP	03 June 2008
Bureau of Indian Affairs Rocky Mountain Regional Office	Department of the Air Force– HQ ACC-A7AP	03 June 2008
Bureau of Indian Affairs Midwest Regional Office	Department of the Air Force– HQ ACC-A7AP	03 June 2008
Bureau of Indian Affairs Great Plains Regional Office	Department of the Air Force– HQ ACC-A7AP	03 June 2008
South Dakota State Historic Society	Department of the Air Force– HQ ACC-A7AP	03 June 2008
State Historical Society of North Dakota	Department of the Air Force– HQ ACC-A7AP	03 June 2008

Section 106 Correspondence		
Recipient	***From***	***Date***
State Parks and Cultural Resource Preservation Office (Wyoming)	Department of the Air Force– HQ ACC-A7AP	03 June 2008
Montana Historical Society	Department of the Air Force– HQ ACC-A7AP	03 June 2008
Wyoming State Parks/Historical Sites HQ	Department of the Air Force– HQ ACC-A7AP	03 June 2008
Chippewa-Cree Business Committee	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Turtle Mountain Tribal Council	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Three Affiliated Tribes Business Council	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Eastern Shoshone Tribal Council	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Rosebud Sioux Tribe	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Arapaho Business Council	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Oglala Sioux Tribal Council	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Confederated Salish and Kootenai Tribe	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Fort Belknap Community Council	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Fort Peck Tribal Executive Board	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Spirit Lake Sioux Tribal Council	Department of the Air Force – HQ ACC-A7PP	03 June 2008
Karen Breslin National Park Service, Intermountain Region	Department of the Air Force – HQ ACC-A7P	03 June 2008
Pat Rooney National Park Service, Midwest Region	Department of the Air Force – HQ ACC-A7P	03 June 2008
Vicki McCuster National Park Service, Natural Sounds Program	Department of the Air Force – HQ ACC-A7P	03 June 2008
Linda DeVine Department of the Air Force PRTC EIS Manager	South Dakota Department of Tourism and State Development	07 July 2008
Linda DeVine Department of the Air Force PRTC EIS Manager	Northern Cheyenne Tribe Administration, Geri Small	28 July 2008

Section 106 Correspondence		
Recipient	***From***	***Date***
Linda DeVine Department of the Air Force PRTC EIS Manager	National Park Service Midwest Region	07 August 2008
Nancy Brown Advisory Council on Historic Preservation	Mr. John Morgenstern Natural/Cultural Resources Manager Department of the Air Force 28 CES/CEVP Ellsworth AFB, SD 57706	01 December 2008
Mr. John Morgenstern Natural/Cultural Resources Manager Department of the Air Force 28 CES/CEVP Ellsworth AFB, SD 57706	Raymond V. Wallace Historic Preservation Technician Federal Property Management Section Office of Federal Agency Programs	03 December 2008
Nancy Brown Advisory Council on Historic Preservation	Mr. John Morgenstern Natural/Cultural Resources Manager Department of the Air Force 28 CES/CEVP	04 February 2009
Leroy Spang Northern Cheyenne Council	Department of the Air Force – Ellsworth 28 BW ACC	05 August 2009
Joseph Brings Plenty Cheyenne River Sioux Tribe	Department of the Air Force – Ellsworth 28 BW ACC	05 August 2009
Ron His Horse Is Thunder Standing Rock Sioux Tribal Council	Department of the Air Force – Ellsworth 28 BW ACC	05 August 2009
Carl Venne, Chairman Crow Tribal Council	Department of the Air Force – Ellsworth 28 BW ACC	05 August 2009

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

15 Feb 08

Colonel Scott A. Vander Hamm
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Rick Wolfname, President
Northern Cheyenne Tribal Council
P.O. Box 128
Lame Deer MT 59043

Dear President Wolfname

I respectfully request a Government-to-Government consultation to discuss a proposal to establish a Military Operations Area (MOA) (Atch 1), in an area that overlies the Northern Cheyenne Indian Reservation.

The 28th Bomb Wing would prefer to personally meet with you and discuss the proposed airspace modifications and alternatives to the proposal to meet training needs of B-1 pilots at Ellsworth AFB SD and B-52 pilots from Minot AFB ND prior to the Air Force publicly releasing a Notice of Intent to prepare an Environmental Impact Statement. Public notification is tentatively scheduled for spring of 2008 and numerous public scoping meetings are being planned shortly after in the affected areas of Montana, Wyoming, North Dakota, and South Dakota (list attached). The scoping meetings were chosen based on their location to the proposed action and in areas we feel would obtain the most comprehensive public outreach. If you would like the Air Force to hold a separate scoping meeting for members of the Northern Cheyenne Tribe, please let me know or have a representative contact Ms. Linda DeVine (Air Combat Command Project Manager) at 757-764-9434 by March 10, 2008 to discuss details.

The scoping meetings will be in held in an open-house format where Air Force representatives will describe the proposed action and alternatives, the National Environmental Policy Act process which we are undertaking, outline opportunities for public involvement, and answer questions the public might have on the proposal. Public notification and details of the scoping meetings will be published in the Federal Register and local papers in advance.

Please contact me at (605) 385-2801 or 1Lt Lauren Wright, public affairs, at (605) 385-5056.

Sincerely,

SCOTT A. VANDER HAMM, COLONEL, USAF

Attachments:
Map
Scoping Locations

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

15 Feb 08

Colonel Scott A. Vander Hamm
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Joseph Brings Plenty, Chairman
Cheyenne River Sioux Tribe
P.O. Box 590
Eagle Butte SD 57625

Dear Chairman Brings Plenty

I respectfully request a Government-to-Government consultation to discuss a proposal to establish a Military Operations Area (MOA) (Atch 1), in an area that overlies a portion of the Cheyenne River Indian Reservation.

The 28th Bomb Wing would prefer to personally meet with you and discuss the proposed airspace modifications and alternatives to the proposal to meet training needs of B-1 pilots at Ellsworth AFB SD and B-52 pilots from Minot AFB ND prior to the Air Force publicly releasing a Notice of Intent to prepare an Environmental Impact Statement. Public notification is tentatively scheduled for spring of 2008 and numerous public scoping meetings are being planned shortly after in the affected areas of Montana, Wyoming, North Dakota, and South Dakota (Atch 2). The scoping meetings were chosen based on their location to the proposed action and in areas we feel would obtain the most comprehensive public outreach. If you would like the Air Force to hold a separate scoping meeting for members of the Cheyenne River Sioux Tribe, please let me know or have a representative contact Ms. Linda DeVine (Air Combat Command Project Manager) at 757-764-9434 by March 10, 2008 to discuss details.

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Sincerely

Scott A. Vander Hamm

SCOTT A. VANDER HAMM, COLONEL, USAF

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Scoping Locations

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

15 Feb 08

Colonel Scott A. Vander Hamm
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Ron His Horse Is Thunder, Chairman
Standing Rock Sioux Tribal Council
P.O. Box D
Fort Yates ND 58538

Dear Chairman His Horse is Thunder

I respectfully request a Government-to-Government consultation to discuss a proposal to establish a Military Operations Area (MOA) (Atch 1), in an area that overlies or a portion of the Standing Rock Indian Reservation.

The 28th Bomb Wing would prefer to personally meet with you and discuss the proposed airspace modifications and alternatives to the proposal to meet training needs of B-1 pilots at Ellsworth AFB SD and B-52 pilots from Minot AFB ND prior to the Air Force publicly releasing a Notice of Intent to prepare an Environmental Impact Statement. Public notification is tentatively scheduled for spring of 2008 and numerous public scoping meetings are being planned shortly after in the affected areas of Montana, Wyoming, North Dakota, and South Dakota (Atch 2). The scoping meetings were chosen based on their location to the proposed action and in areas we feel would obtain the most comprehensive public outreach. If you would like the Air Force to hold a separate scoping meeting for members of the Standing Rock Sioux Tribe, please let me know or have a representative contact Ms. Linda DeVine (Air Combat Command Project Manager) at 757-764-9434 by March 10, 2008 to discuss details.

The scoping meetings will be in held in an open-house format where Air Force representatives will describe the proposed action and alternatives, the National Environmental Policy Act process which we are undertaking, outline opportunities for public involvement, and answer questions the public might have on the proposal. Public notification and details of the scoping meetings will be published in the Federal Register and local papers in advance.

Please contact me at (605) 385-2801 or 1Lt Lauren Wright, public affairs, at (605) 385-5056.

Sincerely

SCOTT A. VANDER HAMM, COLONEL, USAF

Attachments:
Map
Scoping Locations

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

15 Feb 08

Colonel Scott A. Vander Hamm
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Carl Venne, Chairman
Crow Tribal Council
P.O. Box 169
Crow Agency MT 59022

Dear Chairman Venne

I respectfully request a Government-to-Government consultation to discuss a proposal to establish a Military Operations Area (MOA) (Atch 1), in an area that overlies a portion of the Crow Indian Reservation.

The 28th Bomb Wing would prefer to personally meet with you and discuss the proposed airspace modifications and alternatives to the proposal to meet training needs of B-1 pilots at Ellsworth AFB SD and B-52 pilots from Minot AFB ND prior to the Air Force publicly releasing a Notice of Intent to prepare an Environmental Impact Statement. Public notification is tentatively scheduled for spring of 2008 and numerous public scoping meetings are being planned shortly after in the affected areas of Montana, Wyoming, North Dakota, and South Dakota (Atch 2). The scoping meetings were chosen based on their location to the proposed action and in areas we feel would obtain the most comprehensive public outreach. If you would like the Air Force to hold a separate scoping meeting for members of the Crow Tribe, please let me know or have a representative contact Ms. Linda DeVine (Air Combat Command Project Manager) at 757-764-9434 by March 10, 2008 to discuss details.

The scoping meetings will be in held in an open-house format where Air Force representatives will describe the proposed action and alternatives, the National Environmental Policy Act process which we are undertaking, outline opportunities for public involvement, and answer questions the public might have on the proposal. Public notification and details of the scoping meetings will be published in the Federal Register and local papers in advance.

Please contact me at (605) 385-2801 or 1Lt Lauren Wright, public affairs, at (605) 385-5056.

Sincerely

Scott A. Vander Hamm

SCOTT A. VANDER HAMM, COLONEL, USAF

Attachments:
Map
Scoping Locations

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 12 2008

Ms. Kathleen Burrage
Crow Nation Office of Legal Counsel
Batcheeitche Avenue
PO Box 340
Crow Agency MT 59022

Dear Ms. Burrage

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1).

As part of this Environmental Impact Analysis Process, and in continuance of Government-to-Government consultation initiated by Colonel Scott Vander Ham~~m, 28 BW/CC,~~ Ellsworth AFB SD, we request your assistance in gathering information concerning previous archaeological and historic studies for the areas under the affected region. We would appreciate any assistance you could provide in identifying and retrieving this important information, as well as concerns you may have about the potential effects of the proposal on significant cultural resources. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

The Air Force is committed to community outreach and we appreciate the opportunity to hold a community meeting at the Apsaalooke Center in Crow Agency on Monday, June 23, 2008 from 9:30 – 11:30 a.m. Open communication of issues is a critical element of the EIS process, and we would appreciate your assistance in posting the attached meeting flyer (Atch 2) around the community and encouraging public participation. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Room 317, Langley AFB VA 23665-2769, not later than August 4, 2008. If you have any specific questions about this request, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 12 2008

Ms. Clara Caufield
Northern Cheyenne Tribal Administration Offices
600 S. Cheyenne Ave.
Lame Deer, MT 59043

Dear Ms. Caufield,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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As part of this Environmental Impact Analysis Process, and in continuance of Government-to-Government consultation initiated by Colonel Scott Vander Hamm, 28 BW/CC, Ellsworth AFB SD, we request your assistance in gathering information concerning previous archaeological and historic studies for the areas under the affected region. We would appreciate any assistance you could provide in identifying and retrieving this important information, as well as concerns you may have about the potential effects of the proposal on significant cultural resources. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

The Air Force is committed to community outreach and we appreciate the opportunity to hold a community meeting at the Northern Cheyenne Tribal Administration Building Council Chambers on Tuesday, June 24, 2008 from 9:30 - 11:30 a.m. Open communication of issues is a critical element of the EIS process, and we would appreciate your assistance in posting the attached meeting flyers (Atch 2) around the community and encouraging public participation. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Rm 317, Langley AFB VA 23665-2769 not later than August 4, 2008. If you have any specific questions about this request, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 12 2008

Mr. Donald Red Thunder
Land Operations Office
Building 2001
Main Street
Eagle Butte SD 57625

Dear Mr. Red Thunder,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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The Air Force is committed to community outreach and we appreciate the opportunity to hold a community meeting at the Multi-Purpose Building in Dupree on Wednesday, July 16, 2008 from 4:00 – 7:00 p.m. Open communication of issues is a critical element of the EIS process, and we would appreciate your assistance in posting the attached meeting flyers (Atch 2) around the community and encouraging public participation. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Room 317, Langley AFB VA 23665-2769 not later than August 4, 2008. If you have any specific questions about this request, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 12 2008

Mr. Richard Bird
Chairman, Economic Committee
PO Box D
Fort Yates ND 58538

Dear Mr. Bird,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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The Air Force is committed to community outreach and we appreciate the opportunity to hold a community meeting at the Bear Soldier District Gym in McLaughlin, SD on Friday, July 11, 2008 from 3:00 – 5:00 p.m. and at the Community Center in Fort Yates on Friday, July 11, 2008 from 6:00 – 8:00 p.m. Open communication of issues is a critical element of the EIS process, and we would appreciate your assistance in posting the attached meeting flyers (Atch 2) around the community and encouraging public participation. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

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Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 12 2008

Chairman Joseph Brings Plenty
Cheyenne River Sioux Tribal Council
PO Box 5690
Eagle Butte SD 57625

Dear Mr. Brings Plenty,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Room 317, Langley AFB VA 23665-2769 not later than August 4, 2008. If you have any specific questions about this request, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

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2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Bureau of Indian Affairs
Standing Rock Agency
PO Box E
Fort Yates, ND 58538

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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4. The Air Force is committed to community outreach. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host public meetings in

communities underlying and/or adjacent to the proposed airspace as identified in the meeting flyer at attachment 2. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. The 28 Bomb Wing Commander at Ellsworth AFB has initiated consultation with the tribal leaders of the Crow, Northern Cheyenne, Standing Rock and Cheyenne River Nations and community meetings are being coordinated on each Native American Reservation. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

5. To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP at the above address not later than August 4, 2008. If you have any specific questions about this proposal, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Bureau of Indian Affairs
Cheyenne River Agency
PO Box 325
Eagle Butte, SD 57625

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Bureau of Indian Affairs
Pine Ridge Agency
PO Box 1203
Pine Ridge, SD 57770

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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BRUCE W. MCDONALD, P.E.
Acting Chief, Programs Division

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2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Bureau of Indian Affairs
Rocky Mt Regional Office
316 N. 26th St.
Billings, MT 59101

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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Acting Chief, Programs Division

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1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Bureau of Indian Affairs
Midwest Regional Office
One Federal Drive, Rm. 550
Ft. Snelling, MN 55111-4007

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Bureau of Indian Affairs
Great Plains Regional Office
115 4th Ave. SE
Aberdeen, SD 57401

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR South Dakota State Historical Society
900 Governors Drive
Pierre, SD 57501-2217

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR State Historical Society of North Dakota
612 East Boulevard Avenue
Bismarck, ND 58505-0830

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
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JUN 3 2008

MEMORANDUM FOR State Parks & Cultural Resources Historic Preservation Office
2301 Central Avenue
Cheyenne, WY 82002

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

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JUN 3 2008

MEMORANDUM FOR Montana Historical Society
225 N. Roberts
PO Box 20121
Helena, MT 59620

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR Wyoming State Parks/Historic Sites HQ
2301 Central Avenue
Cheyenne, WY 82002

FROM: HQ ACC/A7P
129 Andrews Street
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Chippewa-Cree Business Committee
Rocky Boy Route, Box 544
Box Elder, MT 59521

Dear Sir/Madam,

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Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Turtle Mountain Tribal Council
PO Box 900
Highway 5 West
Belcourt, ND 58316

Dear Sir/Madam,

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Three Affiliated Tribes Business Council
404 Frontage Road
New Town, ND 58763

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2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Eastern Shoshone Tribal Council
15 North Fork Road
PO Box 538
Fort Washakie, WY 82514

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Rosebud Sioux Tribe
PO Box 430
Rosebud, SD 57570

Dear Sir/Madam,

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Arapaho Business Council
PO Box 396
Fort Washakie, WY 82514

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Oglala Sioux Tribal Council
PO Box 2070
Pine Ridge, SD 57770

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Confederated Salish and Kootenai Tribe
PO Box 278
51383 Highway 93 North
Pablo, MT 59855

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HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Fort Belknap Community Council
RR1, Box 66
Harlem, MT 59526

Dear Sir/Madam,

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The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1).

As part of this Environmental Impact Analysis Process, the Air Force would like to consider your concerns and initiate Government-to-Government consultation regarding the proposed action. We are in the early stages of gathering information concerning previous archaeological and historic studies for the areas under the affected region. We would appreciate any assistance you could provide in identifying and retrieving this important information, as well as concerns you may have about the potential effects of the proposal on significant cultural resources. All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

The Air Force is committed to community outreach. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host public

meetings in communities underlying and/or adjacent to the proposed airspace as identified in the meeting flyer at attachment 2. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the NHPA with public involvement in the EIS prepared under the Environmental Impact Analysis Process. Meetings with public, agency, and Native American stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues to be considered in the environmental impact analysis process.

To ensure the Air Force has sufficient time to consider your input in the preparation of the Draft EIS, please provide information and/or comments to Ms. Linda DeVine, HQ ACC/A7PP at the above address not later than August 4, 2008. If you have any specific questions about this proposal, please feel free to contact Ms. Linda DeVine at (757) 764-9434, or by electronic-mail at acc.prtc@langley.af.mil. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
1. Scoping Meeting Brochure
2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Fort Peck Tribal Executive Board
PO Box 1027
501 Medicine Bear Road
Poplar, MT 59255

Dear Sir/Madam,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

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2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

Spirit Lake Sioux Tribal Council
PO Box 359
Fort Totten, ND 58335

Dear Sir/Madam,

The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

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Sincerely,

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachment:
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2. Flyer

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR COMBAT COMMAND
LANGLEY AIR FORCE BASE, VIRGINIA

JUN 3 2008

MEMORANDUM FOR DISTRIBUTION

FROM: HQ ACC/A7P
129 Andrews Street, Room 317
Langley AFB VA 23665-2769

SUBJECT: Powder River Training Complex, Environmental Impact Statement (EIS)

1. The United States Air Force (Air Force) is in the process of preparing an EIS to assess the potential environmental consequences of a proposal to expand and enhance the existing Powder River Complex (PRC) near Ellsworth Air Force Base (AFB) SD. The proposal would create the Powder River Training Complex (PRTC). The PRTC would more effectively use limited resources and finite flying hours by providing locally the realistic training needed by B-1 and B-52 aircrews flying from Ellsworth AFB SD and Minot AFB ND, respectively. This airspace proposal addresses the training and other limitations affecting the existing PRC training assets as they are currently configured.

2. The proposed action would restructure and reconfigure the existing Powder River Military Operations Areas (MOAs) and associated Air Traffic Control Assigned Airspaces (ATCAAs). The PRTC proposal would establish two air refueling routes, create additional low altitude MOA (500 feet Above Ground Level [AGL] up to, but not including, 18,000 feet above Mean Sea Level [MSL]) and high-altitude ATCAA (18,000-60,000 MSL) combinations in portions of South Dakota, North Dakota, Wyoming and Montana. The proposal would support additional ground-based assets to simulate threats and an increase in aircraft training flights, permit the use of training chaff and flares, and authorize supersonic flight above 10,000 AGL. Three action alternatives and a no-action alternative have currently been identified for analyses and are discussed in the attached meeting brochure (Atch 1). All or portions of the following locations have the potential of being affected by the proposal's overhead training airspace due to one or more of the alternatives: ***Montana***—Crow and Northern Cheyenne Reservations and the counties of Big Horn, Carter, Custer, Fallon, Powder River, Rosebud, Treasure, and Yellowstone; ***North Dakota***—Standing Rock Reservation and Adams, Billings, Bowman, Golden Valley, Grant, Hettinger, Morton, Sioux, Slope, and Stark counties; ***South Dakota***—Standing Rock and Cheyenne River Reservations, and Butte, Corson, Harding, Lawrence, Meade, Pennington, Perkins, Ziebach counties; and ***Wyoming***: Campbell, Crook, Sheridan, and Weston counties.

3. Recognizing that open communication of issues is a critical element of the EIS process, the Air Force will host numerous public meetings in communities underlying and/or adjacent to the proposed action (Atch 2). The scoping meetings will be in held in an open-house format, where Air Force representatives will describe the proposed action and alternatives, the National Environmental Policy Act process which we are undertaking, outline opportunities for public involvement, and answer questions on the proposal. The meetings will last from 4:00 to 7:00 pm

at all locations, and interested parties or citizens are welcome to come at any time since information will be provided throughout the duration of the open house.

4. Meetings with public and agency stakeholders during this scoping process will help identify the full range of reasonable alternatives, potential impacts, and key issues throughout the environmental impact analysis process. The Air Force intends to coordinate public involvement for the purpose of Section 106 review under the National Historic Preservation with public involvement in the EIS prepared under this Environmental Impact Analysis Process. The Federal Aviation Administration has accepted the Air Force's request to be a cooperating agency for this action and has appointed the Central Service Area as their office of primary responsibility for this EIS.

5. The Air Force will accept comments at any time during the environmental process and any information you feel would assist us in this process would be appreciated. To ensure the Air Force has sufficient time to consider public input in the preparation of the draft EIS, information and comments should be submitted to Ms. Linda DeVine, HQ ACC/A7PP, 129 Andrews Street, Room 317, Langley AFB VA 23665-2769 by August 4, 2008.

6. If you have any specific questions about this proposal, please feel free to contact Ms. DeVine at (757) 764-9434, by electronic-mail at acc.prtc@langley.af.mil or contact the public affairs office at Ellsworth AFB SD, 605-385-5056. You may also obtain information including the two attachments to this letter, from our website at www.accplanning.org. Thank you in advance for your assistance in this matter.

BRUCE W. MACDONALD, P.E.
Acting Chief, Programs Division

Attachments:
1. Scoping Meeting Brochure
2. Flyer

DISTRIBUTION LIST

Nadenicek Joe
SD Dept. of Environmental and Natural Resources
523 E Capitol Avenue
Pierre, SD 57501

James Boyd
ND Division of Community Service
PO Box 2057
600 E Boulevard Ave, Dept 105
Bismarck, ND 58502

Vicki McCusker
NPS Natural Sounds Program
1201 Oakridge Dr., Suite 100
Fort Collins, CO 80525

Chris Hanson
Bureau of Land Management
Buffalo Field Office
1425 Fort Street
Buffalo, WY 82834

Stephen Potts
U.S. Environmental Protection Agency, Region 8 - Montana Office
10 W 15th St, Ste. 3200
Helena, MT 59626

Barry Cooper
Federal Aviation Administration
Great Lakes Region
2300 East Devon Avenue
Des Plaines, IL 60018

Dennis Roberts
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Avenue Southwest
Renton, WA 98057

Mary Sexton
Department of Natural Resources and Conservation
1625 Eleventh Avenue
Helena, MT 59620

Gary Preszler
North Dakota State Land Dept.
1707 North 9th Street
PO Box 5523
Bismarck, ND 58506-5523

Everts Tom
Legislative Environmental Quality Council
Room 171 State Capitol
PO Box 201704
Helena, MT 59620

Willie R. Taylor, PhD
Office of Environmental Policy and Compliance
U.S. Department of the Interior
1849 "C" Street NW, M/S 2342
Washington, DC 20240

Vi Hillman
Bureau of Land Management
Newcastle Field Office
1101 Washington Blvd
Newcastle, WY 82701-2968

Lonny Bagley
Bureau of Land Management
North Dakota Field Office
99 23rd Avenue West, Suite A
Dickinson, ND 58601

Gene Terland
Bureau of Land Management
5001 Southgate Drive
Billings, MT 59101

Ron de Yong
Montana Department of Agriculture
303 N Roberts Street
Helena, MT 59620

Marian Atkins
Bureau of Land Management
South Dakota Field Office
310 Roundup Street
Belle Fourche, SD 57717-1698

Mark Baumler
Montana Historical Society
225 N. Roberts
PO Box 20121
Helena, MT 59620

Cheryl Kulas
ND Indian Affairs Commission
600 East Boulevard Avenue
1st Floor - Judicial Wing
Bismarck, ND 58505-0300

Karen Breslin
National Park Service, Intermountain Region
12795 Alameda Pkwy
Denver, CO 80225

Patty Rooney
National Park Service, Midwest Region
601 Riverfront Drive
Omaha, NE 68102

Larry Svoboda
US Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Elaine Raper
Bureau of Land Management
Miles City Field Office
111 Garryowen Road
Miles City, MT 59301-0940

Don Simpson
Bureau of Land Management
5353 Yellowstone
Cheyenne, WY 82009

Tom Tidwell
USDA Forest Service
Northern Region One
PO Box 7669
Missoula, MT 59807

Richard Opper
MT DEQ
1520 E Sixth Avenue
PO Box 200901
Helena, MT 59620-0901

Jeff Hagener
Montana Fish, Wildlife, and Parks
1420 E 6th Avenue
PO Box 200701
Helena, MT 59620

John Hoeven
North Dakota Governor's Office
600 East Boulevard Avenue
Bismarck, ND 58505-0001

Roger Johnson
North Dakota Department of Agriculture
600 E Boulevard Ave Dept 602
Bismarck, ND 58505-0020

Steven Pirner, P.E.
SD DENR
PMB 2020
Joe Foss Building
523 E Capitol
Pierre, SD 57501

Steven Doohen
South Dakota Department of Military & Veterans Affairs
Soldiers & Sailors Memorial Building
425 East Capitol Avenue
Pierre, SD 57501-5070

Mary Hopkins
State Parks & Cultural Resources
Historic Preservation Office
2301 Central Avenue
Cheyenne, WY 82002

Karl Altenburg
North Dakota Wing Civil Air Patrol
PO Box 608
Bismarck, ND 58502-0608

John Etchepare
Wyoming Department of Agriculture
2219 Carey Avenue
Cheyenne, WY 82002-0100

Joe Moore
Wyoming Office of Homeland Security
122 West 25th Street
Herschler Bldg, 1st Floor East
Cheyenne, WY 82002

Mike Rounds
State of South Dakota
Office of the Governor
500 E Capitol Avenue
Pierre, SD 57501

Larry Kotchman
North Dakota Forest Service
Molberg Center
307 First Street East
Bottineu, ND 58318

David Freudenthal
State of Wyoming
State Capitol, 200 West 24th Street
Cheyenne, WY 82002-0010

Jeff Vonk
South Dakota Game, Fish and Parks
523 East Capitol Avenue
Pierre, SD 57501

Tom Dravland
South Dakota Department of Public Safety
118 West Capitol Avenue
Pierre, SD 57501

Douglass Prchal
North Dakota Parks and Recreation Department
1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649

Bruce Lindholm
South Dakota DOT
Office of Aeronautics
700 E Broadway Avenue
Pierre, SD 57501-2586

John Cox
WYDOT Headquarters
5300 Bishop Blvd
Cheyenne, WY 82009-3340

John Corra
Department of Environmental Quality
122 West 25th Street
Herschler Building, 4th Floor West
Cheyenne, WY 82002

Terry Cleveland
Wyoming Game and Fish
5400 Bishop Boulevard
Cheyenne, WY 82006

William Even
South Dakota Department of Agriculture
523 E Capitol Avenue
Pierre, SD 57501-3182

Mike Kintigh
South Dakota Game, Fish and Parks
3305 W South Street
Rapid City, SD 57702

Roger Campbell
South Dakota Office of Tribal Government Relations
Capitol Lake Plaza
711 East Wells Avenue
Pierre, SD 57501-3369

Paul Schadewald
North Dakota Game and Fish Department
100 North Bismarck Expressway
Bismarck, ND 58501-5095

Richard Benda
Department of Tourism and State Development
711 E Wells Avenue
Pierre, SD 57501-3369

Barry Bowersox
WYDOT
District 4
3540 Warlow Drive
Gillette, WY 82716

Tanner Shatto
Department of Environmental Quality, Sheridan Field Office
1866 S Sheridan Avenue
Sheridan, WY 82801

Jim Boyd
North Dakota Department of Commerce
1600 E Century Avenue, Ste. 2
PO Box 2057
Bismarck, ND 58502-2057

South Dakota
Department of Tourism and State Development

July 7, 2008

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Room 317
Langley AFB, VA 23665-2769

Project: 080604006F – Power River Training Complex, Environmental Impact Statement
Location: Multiple Counties
(DOD/Air Force)

Dear Ms. DeVine:

Thank you for the opportunity to comment on the above referenced project. The South Dakota Office of the State Historic Preservation Officer (SHPO) would like to provide the following list of areas in South Dakota that may be considered Traditional Cultural Properties and/or places of religious and cultural significance to Indian Tribes. The list also includes contact information for each land managing agency associated with the resource.

Bear Butte National Historic Landmark:	Bear Butte State Park PO Box 688; E Hwy 79 Sturgis, SD 57785
National Park Service:	Ernest Quintana, Regional Director National Park Service, MWRO 601 River Front Drive Omaha, NE 68102
Black Hills:	District Ranger Black Hills National Forest Northern Hills Ranger District 2014 N. Main Street Spearfish, SD 57783
Custer National Forest:	Forest Supervisor Custer National Forest 1310 Main Street Billings, MT 59105

Please note the above list is not all inclusive. For additional information concerning the identification of historic properties, we recommend contacting the appropriate consulting parties as outlined in 36 CFR part 800 – Protection of historic properties. For your convenience a list of Indian Tribes and contact information has been included.

Should you require additional information, please contact Paige Hoskinson Olson, Review and Compliance Coordinator, at (605) 773-6004. Your concern for the non-renewable cultural heritage of our state is appreciated.

Sincerely,

Jay D. Vogt
State Historic Preservation Officer

Paige Hoskinson Olson
Review and Compliance Coordinator

Enclosure: South Dakota Tribal Chairman and Tribal Historic Preservation Offices

South Dakota Tribal Chairman and Tribal Historic Preservation Offices

Chairman: Joseph Brings Plenty
Cheyenne River Sioux Tribe
PO Box 590
Eagle Butte, SD 57625-0590
Phone (605) 964-4155
Fax (605) 964-4151

THPO:
Cheyenne River Sioux Tribe
Tribal Historic Preservation Office
PO Box 590
Eagle Butte, SD 57625
Phone (605) 964-7554
Fax (605) 964-7552

Chairman: Brandon Sazue Sr.
Crow Creek Sioux Tribe
PO Box 50
Ft. Thompson, SD 57339-0050
Phone (605) 245-2221
Fax (605) 245-2470

Chairman: Josh Weston
Flandreau-Santee Sioux Tribe
PO Box 283
Flandreau, SD 57028-0283
Phone (605) 997-3512
Fax (605) 997-3878

Chairman: Michael Jandreau
Lower Brule Sioux Tribe
PO Box 187
Lower Brule, SD 57548-0187
Phone (605) 473-5561
Fax (605) 473-5606

Cultural Resources: Scott Jones
Lower Brule Sioux Tribe
PO Box 187
Lower Brule, SD 57548-0187
Phone (605) 473-5561
Fax (605) 473-5606

Chairman: John Yellow Bird Steele
Oglala Sioux Tribe
PO Box 2070
Pine Ridge, SD 57770-2070
Phone (605) 867-5821
Fax (605) 867-1449

Cultural Resources: Joyce Whiting
Oglala Sioux Tribe
US Highway 18
Behind Tribal Building
Pine Ridge, SD 57770
(605) 867-1271

Chairman: Rodney Bordeaux
Rosebud Sioux Tribe
PO Box 430
Rosebud, SD 57570-0430
Phone (605) 747-2381
Fax (605) 747-2243

THPO: Russell Eagle Bear
Rosebud Sioux Tribe
Tribal Historic Preservation Office
PO Box 658
Rosebud, SD 57570-0658
Phone (605) 747-2381
Fax (605) 747-4227
Kathy Arcoren
Phone (605) 747-4255
rstthpo@yahoo.com

Chairman: Mike Selvage
Sisseton-Wahpeton Oyate
PO Box 509
Agency Village, SD 57262-0509
Phone (605) 698-3911
Fax (605) 698-3708

Chairman: Ron His Horse Is Thunder
Standing Rock Sioux Tribe
PO Box D
Ft. Yates, ND 58538-0522
Phone (701) 854-8500
Fax (701) 854-7299

Chairman: Robert Cournoyer
Yankton Sioux Tribe
PO Box 248
Marty, SD 57361-0248
Phone (605) 384-3641
Fax (605) 384-5687

Chairman: Marcus D. Wells, Jr.
Mandan, Hidatsa & Arikara Nation
Three Affiliated Tribes
404 Frontage Road
New Town, ND 58763
Phone: (701) 627-4781
Fax (701) 627-4748

THPO: Dianne Desrosiers
Sisseton-Wahpeton Oyate
PO Box 907
Sisseton, SD 57262
Phone (605) 698-4972
Fax (605) 698-7054

THPO: Tim Mentz, Sr.
Standing Rock Sioux Tribe
Tribal Historic Preservation Office
PO Box D
Fort Yates, ND 58538
Phone (701) 854-2120
Fax (701) 854-2138

THPO:
Mandan, Hidatsa & Arikara Nation
Three Affiliated Tribes
404 Frontage Road
New Town, ND 58763
Phone: (701) 627-4781
Fax (701) 627-4748

THPO: Brady Grant
Turtle Mountain Band of Chippewa
PO Box 900
Belcourt, North Dakota 58316
(701) 477-2604

THPO: Pam Halverson
Lower Sioux Indian Community
PO Box 308
39527 Res Hwy 1
Morton MN 56270
(507)697-6185

THPO: Curley Youpee
Fort Peck
PO Box 836
Poplar MT 59255
(406) 768-5155

THPO: Joanne White
Northern Arapaho Tribe
533 Ethete Rd
Ethete, WY 82520

-WOHEHIV-
The Morning Star

NORTHERN CHEYENNE TRIBE
ADMINISTRATION
P.O. BOX 128
LAME DEER, MONTANA 59043
(406) 477-6284
FAX (406) 477-6210

-WOHEHIV-
The Morning Star

July 28, 2008

Linda DeVine, PRTC EIS Manager
129 Andrews St., Ste 102
Langley AFB, VA 23665-2769

Dear Ms. DeVine;

The Northern Cheyenne Tribe appreciates your efforts in assuring that all parties are included in the scoping process. We are currently conducting an internal analysis from tribal programs and departments for comments and concerns regarding the Powder River Training Complex (PRTC) and the long term effects on the Northern Cheyenne reservation.

We would like to set up a meeting during the month of August as part of the government to government consultation process with Indian tribes. Specifically, the Northern Cheyenne Tribe would like to meet with the United States Air Force and discuss the effects of the PRTC management plan within the Northern Cheyenne reservation and ancestral lands within the PRTC.

A tentative date during the week of the 11th of August has been suggested. If this date is suitable please let our office know so that we can schedule a meeting with the Northern Cheyenne Tribal Council.

We would also like to request that the comments gathered will be forwarded to your office two (2) weeks after the suggested meeting has occurred.

If you have any questions, please let my office know.

Sincerely,

Geri Small

Geri Small, President
Northern Cheyenne Tribe

605-385-4407

United States Department of the Interior

National Park Service

Midwest Region
601 Riverfront Drive
Omaha, Nebraska 68102-4226

L 7 AUG 2008
ER-08/0406(MWR-PCL/PC)

Ms. Linda DeVine
HQ ACC/A7PP
129 Andrews Street, Suite 317
Langley Air Force Base, Virginia 23665-2769

Dear Ms. DeVine:

The Department of the Interior (Department) has asked the National Park Service (NPS) to review and comment on the Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Powder River Complex expansion located near Ellsworth Air Force Base, South Dakota. We offer the following comments for your consideration:

The proposed Powder River Complex expansion affects the northeast part of Wyoming, the southeast part of Montana, the southwest part of North Dakota, and the northwest part of South Dakota. National parks in the area include Theodore Roosevelt National Park, Mount Rushmore National Memorial, Devils Tower National Monument, Bighorn Canyon National Recreation Area, and Little Bighorn Battlefield, which are located within or very near the expansion area. The NPS is concerned about the potential of the proposed action to adversely affect the soundscapes of these parks.

The NPS evaluates Federal actions which may impact the human and natural environment within our parks with respect to our Organic Act mandates, including:

> ... to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.

We are different from other Federal land management agencies in that, in addition to our national legislative mandates, each individual park is established under separate legislative authority which identifies specific purposes for the park and often includes the identification of key natural or cultural resources which define the integrity of the park.

Natural and cultural sounds are integral components of the suite of resources and values which NPS managers are charged with preserving and restoring. A soundscape refers to the total acoustic environment of an area. The soundscape (like air, water, scenery, or wildlife) of a national park is a valuable resource that can easily be degraded or destroyed by inappropriate sound levels and frequencies. An area's ability to transmit ecologically significant sounds is a function of the amount of extraneous noise intrusion.

We understand, at this stage in the process, the U.S. Air Force (USAF) would not include information in the Notice of Intent regarding how the environmental impact analysis would be

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conducted. However, we are aware the USAF typically uses the day-night average sound level (DNL) metric in their environmental impact assessments. The DNL is an energy-based noise-averaging metric widely used by the Federal Aviation Administration (FAA) and the Department of Defense as the primary means for determining the cumulative noise energy exposure of individuals to noise resulting from aviation activities. Therefore, thresholds of significance that have been established by the FAA are based on community response. The FAA Order 1050.1E notes that special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within national parks. Since assumptions regarding the DNL levels are community-based in relation to airports, this metric is not adequate to assess impacts of noise to park resources, values, and visitor experience.

The NPS mission to conserve unimpaired park resources and values is a different standard than significance as defined by the FAA and other agencies. In recognition of the agencies' differences in mission and acknowledgement that special consideration needs to be given to the evaluation of noise impacts on noise-sensitive areas, it is imperative to provide information in the EIS for the NPS to be able to characterize the noise impacts from the proposed action and alternatives. Only then can Park Managers make decisions about impacts to park resources, values, and visitor experience. The NPS uses audibility-based, or "time above," metrics in order to express the time the sound level is above ambient. This takes into account the duration of aircraft noise events, the number of aircraft noise events, and the absolute sound level of events. "Time above" metrics correlate better with flight operations than the DNL metrics which obscure the dynamic range of acoustic events (www.fican.org/pdf/HanscomNoise.pdf). These supplemental metrics would also better satisfy the requirements under the National Environmental Policy Act (NEPA) to characterize impacts to the environment in terms of intensity, context, and duration (40 CFR 1508.27). The NPS Natural Sounds Program would be happy to discuss the inclusion of supplemental metrics in the EIS with the USAF.

We are concerned that the proposed expansion of existing military operations airspace would allow flights down to 500 feet above ground level as well as permitting supersonic flights within the proposed Powder River Complex expansion. The NPS would prefer no supersonic or low-level flights over park units. For example, the NPS worked with the FAA to establish a No-Fly Advisory Zone for the Devils Tower National Monument. The existing No-Fly Zone Advisory Bulletin between the Billings Area FAA and the Devils Tower National Monument is enclosed for your reference. Alternative B would appear to support our desire for no low-level flights over park units. We are also concerned about the use of chaff and flares in and near park units.

We seek mutually beneficial solutions related to impacts associated with the proposed project – solutions that articulate how natural and cultural values interrelate in healthy ecosystems/cultural landscapes, and how public enjoyment of these places as well as the need to ensure realistic training needed by the USAF can be part of a strategy for ensuring the resources are protected unimpaired for future generations. The NPS has worked with the USAF through the Regional Airspace/Range Council meetings regarding military overflight issues, and has found the USAF to be very receptive to the NPS concerns and willing to find mutually acceptable solutions. We have

every confidence that this proactive interagency relationship will continue throughout the NEPA process and we look forward to working with the USAF regarding the NPS concerns about the proposed Power River Complex expansion.

The Department has a continuing interest in working with the USAF to ensure impacts to resources of concern to the Department are adequately addressed. For matters related to these comments, please contact Regional Environmental Coordinator Nick Chevance, National Park Service, Midwest Regional Office, 601 Riverfront Drive, Omaha, Nebraska 68102-4226, telephone: 402-661-1844.

We appreciate the opportunity to provide these comments.

Sincerely,

Ernest Quintana
Regional Director

Enclosure

Devils Tower

National Park Service
U.S. Department of Interior

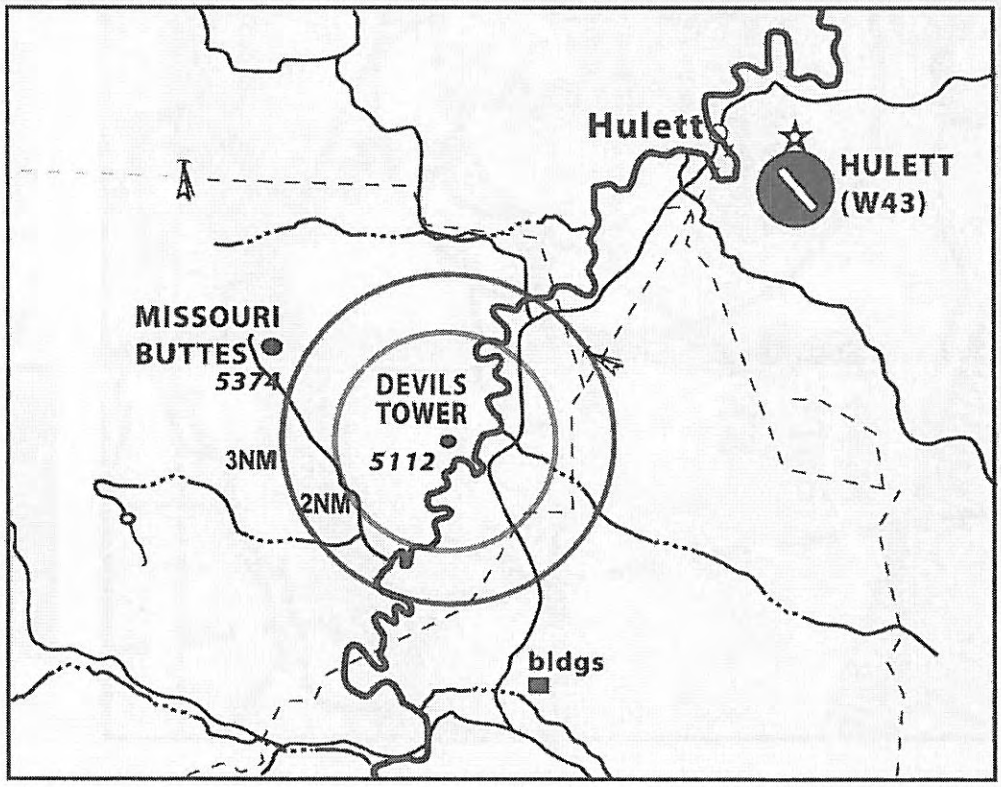
Devils Tower National Monument

No-Fly Advisory Zone

When the airport at Hulett, Wyoming (W43) was established, an agreement between the Federal Aviation Administration, Town of Hulett, Hulett Airport Advisory Board and Devils Tower National Monument created a "No-Fly Advisory Zone".

The No-Fly Advisory Zone recognizes the cultural significance of Devils Tower as a sacred site to over 20 American Indian Tribes, as well as the monument's purpose to preserve the lofty and isolated rock and surrounding public land as an object of historic and scientific interest for the enjoyment, education and inspiration of this and future generations.

The advisory is centered on Devils Tower, (Lat: 44°35'25.86"N, Long: 104°42'54.57"W) and extends for 2 nautical miles (NM) throughout the year, except for the month of June, when it extends for 3 nautical miles. The advisory includes no overflights of the Tower throughout the year. The Hulett (W43) airport is approximately 7.5 nautical miles northeast of Devils Tower. Pilots are advised to fly routes in northeasterly or southeasterly directions when using the airport for arrivals or departures to avoid the no-fly advisory zone.



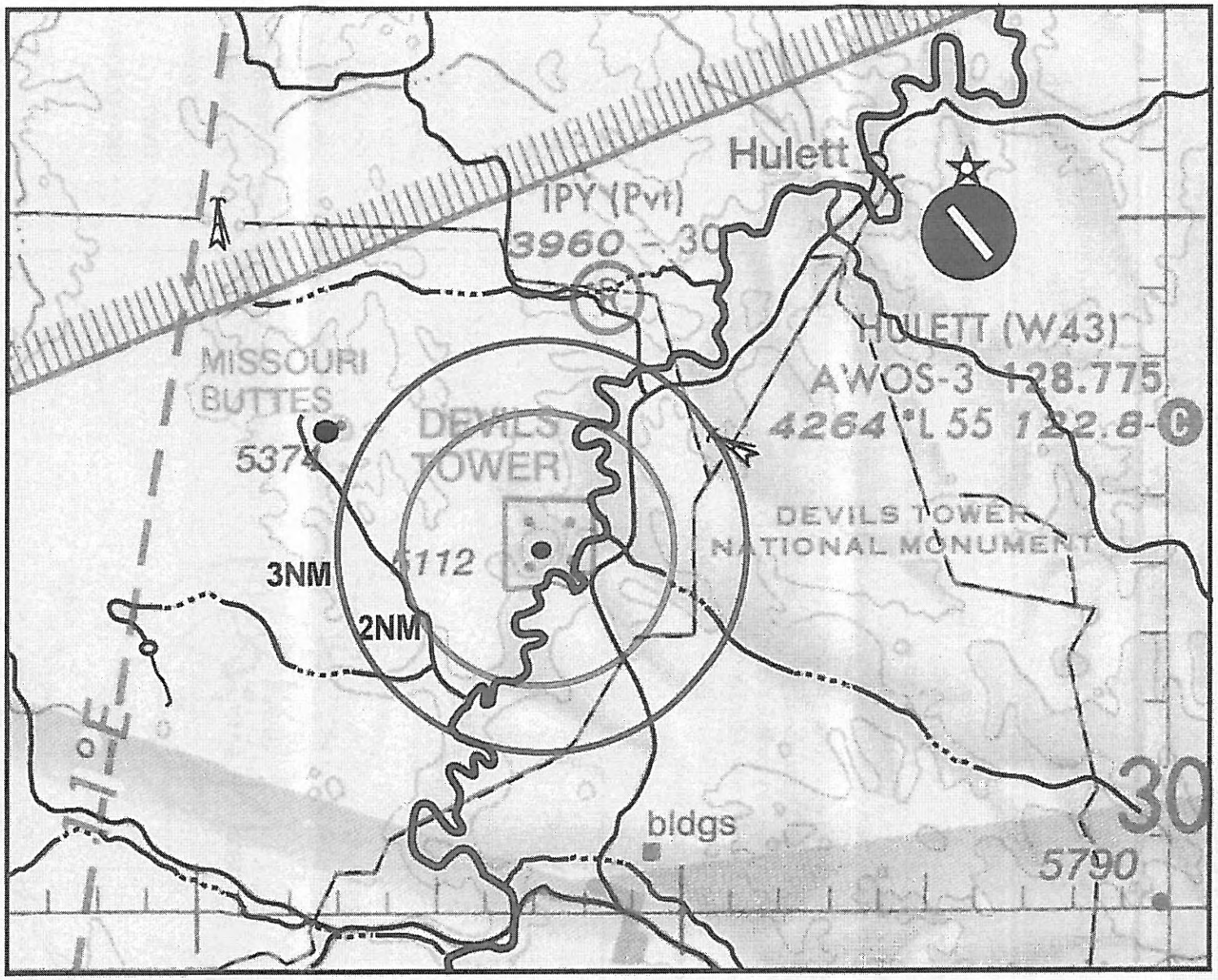
Visual Flight References for the No-Fly Advisory

-Missouri Buttes
-Wyoming Hwy 24,
-Power lines
-Belle Fourche River

Legend

- 3 mile radius
- 2 mile radius
- major roads
- river
- power lines

For information purposes only, not for navigation



Legend

- power lines
- 3 mile radius
- 2 mile radius
- major roads
- river

For information purposes only, not for navigation

From: Morgenstern, John E Civ USAF ACC 28 CES/CEANN [John.Morgenstern@ellsworth.af.mil]
Sent: Monday, December 01, 2008 1:53 PM
To: Nancy Brown
Cc: Green, Paul R ACC Civ USAF ACC ACC/A7AN; Rudolph, Teresa P; DeVine, Linda A ACC Civ USAF ACC ACC/A7PP; Jensen, Melody A Civ USAF ACC 28 CES/CEAON; Bodine, Douglas P Maj USAF ACC 28 OSS/ADO
Subject: Invitation ot Participate in Sec 106 Consultaion

Nancy,

The Air Force, and more specifically Air Combat Command (ACC) and Ellsworth AFB, proposes to expand its current Powder River Training Complex (PRTC) from a fly-over area of approximately 14,800 square miles to as much as 37,800 square miles. A Notice of Intent to prepare an Environmental Impact Statement for this proposal was published in the Federal Register on 29 May 2008.

The proposed expansion of the PRTC has the potential to directly impact four states (North Dakota, South Dakota, Montana, and Wyoming) and four Indian Reservations (the Cheyenne River in South Dakota, the Standing Rock in North and South Dakota, and the Northern Cheyenne and Crow in Montana). Other tribes not a part of these reservations may also attach religious and/or cultural significance to the areas affected and thus become consulting parties in the Section 106 process.

During June and July 2008, public scoping meetings were held at numerous locations affected by the proposed range expansion both on and off the reservations. Many written public comments were received that will be considered and addressed in the EIS.

Colonel Vander Hamm, Commander, 28th Bomb Wing, Ellsworth AFB, SD, has met on a government-to-government basis with leaders of the four primary tribes to explain the proposal and how they and their reservations may have the potential to be affected by training missions. These meetings were held prior to the public scoping meetings.

Pursuant to CFR 36 Part 800, I would like to take this opportunity to invite the ACHP to participate in further Section 106 consultation along with the appropriate SHPOs and/or THPOs affected by or having an interest in the PRTC expansion proposal. Thank you for your consideration and I look forward to your reply.

Sincerely,

John Morgenstern

John Morgenstern
Natural/Cultural Resources Manager
28 CES/CEVP
Ellsworth AFB SD 57706
(605) 385-2690, DSN: 675-
john.morgenstern@us.af.mil

Preserving America's Heritage

December 3, 2008

Mr. John Morgenstern
Natural/Cultural Resources Manager
Department of the Air Force
28 CES/CEVP
Ellsworth AFB, SD 57706

REF: Proposed Expansion of the Powder River Training Complex

Dear Mr. Morgenstern:

On December 1, 2008, the Advisory Council on Historic Preservation (ACHP) received your notification for the referenced project which was submitted in accordance with Section 800.6(a)(1) of our regulations, "Protection of Historic Properties" (36 CFR Part 800). Unfortunately, the background documentation included with your submission does not meet the specifications listed in Section 800.11(e). We, therefore, are unable to determine whether Appendix A of the regulations, *Criteria for Council Involvement in Reviewing Individual Section 106 Cases*, applies to this undertaking. Accordingly, we request that you submit the following information so that we can determine whether our participation is warranted:

- A description of the undertaking, including photographs, maps, drawings, as necessary;
- A description of the steps to identify historic properties;
- A description of the affected historic properties;
- A description of the undertaking's effect on historic properties;
- An explanation of why the criteria of adverse effect were found applicable or inapplicable; and
- Copies or summaries of any views provided by consulting parties and the public, including
  comments from the Tribal Historic Preservation Officers, Indian tribes, and the appropriate State Historic Preservation Officers (SHPOs)

Upon receipt of the additional information, we will notify you within 15-days of our decision. Should you have any questions, feel free to contact Nancy Brown at 202-606-8582, or via email at nbrown@achp.gov.

Sincerely,

Raymond V. Wallace

Raymond V. Wallace
Historic Preservation Technician
Federal Property Management Section
Office of Federal Agency Programs

From: Morgenstern, John E Civ USAF ACC 28 CES/CEANN [John.Morgenstern@ellsworth.af.mil]
Sent: Wednesday, February 04, 2009 9:53 AM
To: Nancy Brown
Cc: Rudolph, Teresa P
Subject: Proposed Expansion of the Powder River Training Complex

Nancy,

I am writing to let you know I (we) have not forgotten or overlooked the ACHP letter dated December 3, 2008, (*REF: Proposed Expansion of the Powder River Training Complex*) requesting additional information/background documentation per 36 CRF Part 800, Section 800.11 (e). Most of the additional background documentation has been compiled; however, some significant details of the proposed undertaking are still being developed and coordinated between the Air Force and the FAA.

When details have been finalized, a description of the proposed undertaking along with the other background documentation will be forwarded to your office as requested.

Please feel free to contact me if you have questions or concerns.

Sincerely,

John Morgenstern

John Morgenstern
Natural/Cultural Resources Manager
28 CES/CEVP
Ellsworth AFB SD 57706
(605) 385-2690, DSN: 675-
john.morgenstern@us.af.mil

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

AUG 0 5 2009

Colonel Jeffrey B. Taliaferro
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Mr. Leroy Spang, President
Northern Cheyenne Council
PO Box 128
Lame Deer MT 59043

Dear President Spang

Having recently assumed command of the 28th Bomb Wing, I am writing to introduce myself prior to the scheduled government-to-government consultation with the Northern Cheyenne Tribal Council on August 17.

I believe meeting will help us both better understand our unique perspectives and continue the meaningful dialogue initiated by Colonel Vander Hamm between the Northern Cheyenne Tribe and Team Ellsworth. Our discussions must be open and honest, respecting each other's cultures, and trusting of each other's desire to maintain a healthy relationship. My goal for this consultation is to get to know you and other members of the tribal council, and to help me better understand and address the concerns identified in President Small's letter to the Air Force on September 8, 2008 in response to the scoping process for the proposed Powder River Training Complex (PRTC). If you have other specific issues you'd like to discuss, please feel free to contact me prior to the scheduled meeting so I can arrive more prepared, and we can make the meeting more productive.

We also welcome you and other members of the tribal council to visit Ellsworth Air Force Base as it would give us an opportunity to familiarize you with our base and the B-1 bomber. I look forward to meeting you and learning more about the people of the Northern Cheyenne Tribe.

Please contact me at (605) 385-2801 if you have any questions. If it's helpful, please feel free to have someone contact Mr. John Morgenstern, my natural and cultural resources manager, at (605) 385-2690.

Sincerely

JEFFREY B. TALIAFERRO, Colonel, USAF

Attachment:
Official Biography

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

AUG 0 5 2009

Colonel Jeffrey B. Taliaferro
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Joseph Brings Plenty, Chairman
Cheyenne River Sioux Tribe
PO Box 590
Eagle Butte SD 57625

Dear Chairman Brings Plenty

Having recently assumed command of the 28th Bomb Wing, I am writing to introduce myself and respectfully request a meeting to continue the government-to-government relationship and meaningful dialogue between the Cheyenne River Sioux Tribe and Team Ellsworth.

I believe meeting will help us both better understand our unique perspectives and continue the meaningful dialogue initiated by Colonel Vander Hamm between the Cheyenne River Sioux Tribe and Team Ellsworth. Our discussions must be open and honest, respecting each other's cultures, and trusting of each other's desire to maintain a healthy relationship. My goal for this consultation is to get to know you and other members of the tribal council. If you have other specific issues you'd like to discuss when we meet, please feel free to contact me prior to the scheduled meeting so I can arrive more prepared, and we can make the meeting more productive.

We would be honored to host you and other members of the tribal council again to visit Ellsworth Air Force Base as it would give us an opportunity to provide you with a base tour. If you'd prefer to meet on the reservation or elsewhere, please let me know the dates you are available. I look forward to meeting you and learning more about the Cheyenne River Sioux Tribe.

Please contact me at (605) 385-2801 if you have any questions. If deemed helpful, you may also have someone contact Mr. John Morgenstern, my natural and cultural resources manager, at (605) 385-2690.

Sincerely

JEFFREY B. TALIAFERRO, Colonel, USAF

Attachment:
Official Biography

Global Power For America

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

AUG 05 2009

Colonel Jeffrey B. Taliaferro
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Ron His Horse Is Thunder, Chairman
Standing Rock Sioux Tribal Council
PO Box D
Fort Yates ND 58538

Dear Chairman His Horse Is Thunder

Having recently assumed command of the 28th Bomb Wing, I am writing to introduce myself and respectfully request a meeting to continue the government-to-government relationship and meaningful dialogue between the Standing Rock Sioux Tribe and Team Ellsworth.

I believe meeting will help us both better understand our unique perspectives and continue the meaningful dialogue initiated by Colonel Vander Hamm between the Standing Rock Sioux Tribe and Team Ellsworth. Our discussions must be open and honest, respecting each other's cultures, and trusting of each other's desire to maintain a healthy relationship. My goal for this consultation is to get to know you and other members of the tribal council. If you have other specific issues you'd like to discuss when we meet, please feel free to contact me prior to the scheduled meeting so I can arrive more prepared, and we can make the meeting more productive.

We welcome you and other members of the tribal council to visit Ellsworth Air Force Base as it would give us an opportunity to provide you with a base tour. If you'd prefer to meet on the reservation or elsewhere, please let me know the dates you are available. I look forward to meeting you and learning more about the Standing Rock Sioux Tribe.

Please contact me at (605) 385-2801 if you have any questions. If deemed helpful, you may also have someone contact Mr. John Morgenstern, my natural and cultural resources manager, at (605) 385-2690.

Sincerely

JEFFREY B. TALIAFERRO, Colonel, USAF

Attachment:
Official Biography

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 28TH BOMB WING (ACC)
ELLSWORTH AIR FORCE BASE SOUTH DAKOTA

AUG 0 5 2009

Colonel Jeffrey B. Taliaferro
Commander, 28th Bomb Wing
1958 Scott Drive, Ste 1
Ellsworth AFB SD 57706-4710

Carl Venne, Chairman
Crow Tribal Council
PO Box 169
Crow Agency MT 59022

Dear Chairman Venne

Having recently assumed command of the 28th Bomb Wing, I am writing to introduce myself and respectfully request a meeting to continue the government-to-government relationship and meaningful dialogue between the Crow Tribe and Team Ellsworth.

I believe meeting will help us both better understand our unique perspectives and continue the meaningful dialogue initiated by Colonel Vander Hamm between the Crow Tribe and Team Ellsworth. Our discussions must be open and honest, respecting each other's cultures, and trusting of each other's desire to maintain a healthy relationship. My goal for this consultation is to get to know you and other members of the tribal council. If you have other specific issues you'd like to discuss when we meet, please feel free to contact me prior to the scheduled meeting so I can arrive more prepared, and we can make the meeting more productive.

We welcome you and other members of the tribal council to visit Ellsworth Air Force Base as it would give us an opportunity to provide you with a base tour. If you'd prefer to meet on the reservation or elsewhere, please let me know the dates you are available. I look forward to meeting you and learning more about the Crow Tribe.

Please contact me at (605) 385-2801 if you have any questions. If deemed helpful, you may also have someone contact Mr. John Morgenstern, my natural and cultural resources manager, at (605) 385-2690.

Sincerely

JEFFREY B. TALIAFERRO, Colonel, USAF

Attachment:
Official Biography