



# 1050.1F Desk Reference

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Federal Aviation Administration  
Office of Environment and Energy

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## Acronyms and Abbreviations

AAD	Average Annual Day
ACHP	Advisory Council on Historic Preservation
AEDT	Aviation Environmental Design Tool
AEE	Office of Environment and Energy
AEM	Area Equivalent Method
AFE	Above Field Elevation
AGC-600	Office of the Chief Counsel, Airports and Environmental Law Division
AGL	Above Ground Level
AIP	Airport Improvement Program
AIRFA	American Indian Religious Freedom Act
ANSI	American National Standards Institute
APA	Aerobic Practice Area
APE	Area of Potential Effects
ATO	Air Traffic Organization
BLM	Bureau of Land Management
BTUs	British Thermal Units
CAA	Clean Air Act
CATEX	Categorical Exclusion
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources System
CCAFS	Cape Canaveral Air Force Station
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
CH <sub>4</sub>	Methane
CMPA	Coastal Management Program Agency
CNEL	Community Noise Equivalent Level
CO	Carbon monoxide

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CO <sub>2</sub>	Carbon dioxide
CoRIS	NOAA's Coral Reef Information System
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	Decibel
dBA	A-weighted sound level
DNL	Day Night Average Sound Level
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DOJ	U.S. Department of Justice
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EDDA	Environmental Due Diligence Audit
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act
EPCRA	Emergency Planning and Community Right to Know Act
EPR	Engine Pressure Ratio
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHBM	Flood Hazard Boundary Map
FHWA	Federal Highway Administration
FICAN	Federal Interagency Committee on Aviation Noise
FICON	Federal Interagency Committee on Noise
FIP	Federal Implementation Plan
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FPO	Federal Preservation Officer
FPPM	Flight Path Performance Module
FSDO	Flight Standards District Office

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FSEP	Facility Service and Equipment Profile
FTA	Federal Transit Administration
FY	Fiscal Year
GHG	Greenhouse Gases
GIS	Geographic Information System
GSA	Government Services Administration
HAPs	Hazardous Air Pollutants
HFCs	Hydrofluorocarbons
HUD	U.S. Department of Housing and Urban Development
ICAO	International Civil Aviation Organization
ID	RCRA Hazardous Waste Generator Identification
IHA	Incidental Harassment Authorization
IPaC	Information, Planning, and Conservation System
IPCC	Intergovernmental Panel on Climate Change
ISR	Indirect Source Review
LC	Launch Complex
L <sub>eq</sub>	Equivalent sound level
L <sub>max</sub>	Maximum sound level
LOA	Letter of Authorization
LOB/SOs	Lines of Business/Staff Offices
LTO	Landing-Takeoff cycle
mg/m <sup>3</sup>	milligram per cubic meter
MLW	Maximum Landing Weight
MMPA	Marine Mammal Protection Act
MOA	Memorandum of Agreement
MOAs	Military Operating Areas
MOU	Memorandum of Understanding
MR_NMAP	Military Operating Area and Range Noise Model
MSL	Mean Sea Level
MT CO <sub>2</sub>	Metric Tonnes of CO <sub>2</sub>
MT CO <sub>2e</sub>	Metric Tonnes of CO <sub>2</sub> equivalent
MTOW	Maximum Take-off Weight
MTRs	Military Training Routes

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N1	Low-pressure Compressor
N <sub>2</sub> O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAR	National Airspace Redesign
NAVAID	Air Navigation Facilities
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHL	National Historic Landmarks
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NMFS OPR	National Marine Fisheries Service Office of Protected Resources
NO	Nitrogen monoxide
NO <sub>2</sub>	Nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO <sub>x</sub>	Nitrogen oxides
NPD	Noise-Power-Distance
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPS	National Park Service
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide River Inventory
NST	Noise Screening Tool
NWI	National Wetlands Inventory
O <sub>3</sub>	Ozone
OCRM	NOAA's Office of Ocean and Coastal Resource Management
ODS	Ozone-Depleting Substances
OFEE	Office of the Federal Environmental Executive
OMB	Office of Management and Budget

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PA	Programmatic Agreement
Pb	Lead
PCBs	Polychlorinated Biphenyls
PFCs	Perfluorocarbons
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter, coarse particles
PM <sub>2.5</sub>	Particulate Matter, fine particles
PMAD	Peak Month Average Day
ppb	part per billion
ppm	part per million
RCRA	Resource Conservation and Recovery Act
RECO	Real Estate Contracting Officer
ROD	Record of Decision
RPM	Revolutions per Minute
RPZ	Runway Protection Zone
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SDWA	Safe Drinking Water Act
SEL	Sound Exposure Level
SEMS	Superfund Enterprise Management System
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO <sub>2</sub>	Sulfur Dioxide
SWMU	Solid Waste Management Units
SWPPP	Storm Water Pollution Prevention Plan
TA	Time Above
TARGETS	Terminal Area Routing Generation, Evaluation, and Traffic Simulation
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer
TIGER	Topologically Integrated Geographic Encoding and Referencing
TSCA	Toxic Substances Control Act
TSD	RCRA Hazardous Waste Treatment, Storage, and Disposal

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USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFS	U.S. Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VALE	Voluntary Airport Low Emissions
VOC	Volatile Organic Compound
$\mu\text{g}/\text{m}^3$	microgram per cubic meter

## Introduction

This Desk Reference provides explanatory guidance for environmental impact analysis performed to comply with Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (CEQ Regulations) (40 Code of Federal Regulations (CFR) parts 1500-1508), U.S. Department of Transportation (DOT) Order 5610.1C, *Procedures for Considering Environmental Impacts*, and Federal Aviation Administration (FAA) Order 1050.1F *Environmental Impacts: Policies and Procedures*.

This Desk Reference is designed to complement FAA Order 1050.1F and should therefore be used in conjunction with the Order. FAA Order 1050.1F defines basic terms that are used throughout the Order and this Desk Reference. In addition, FAA Order 1050.1F outlines the requirements under the FAA's National Environmental Policy Act (NEPA) implementing procedures. When citing requirements from laws, regulations (including the CEQ Regulations), DOT Order 5610.1C, FAA Order 1050.1F, or other authorities, cite the original source authority and not this Desk Reference. **This Desk Reference may be cited only as a reference for the guidance it contains, and may not be cited as the source of requirements under laws, regulations, Executive Orders, DOT or FAA directives, or other authorities.**

This Desk Reference can be used for guidance to help integrate applicable special purpose laws and requirements when preparing NEPA documents.

As shown in Exhibit i-1 below, a discussion of the impact analysis process specific to each impact category is presented in Chapters 1 through 14. A discussion of cumulative impact analysis is presented in Chapter 15, and a discussion of impact analysis related to irreversible and irretrievable commitment of resources is presented in Chapter 16.

The Desk Reference also includes Chapter 17 that includes guidance on implementation of specific Categorical Exclusions (CATEXs).

### Exhibit i-1. Location of Impact Category Discussion in this Desk Reference

Chapter	Impact Category
1	Air Quality
2	Biological Resources
3	Climate
4	Coastal Resources
5	Department of Transportation Act, Section 4(f)
6	Farmlands
7	Hazardous Materials, Solid Waste, and Pollution Prevention



Chapter	Impact Category
8	Historical, Architectural, Archeological, and Cultural Resources
9	Land Use
10	Natural Resources and Energy Supply
11	Noise and Noise-Compatible Land Use
12	Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
13	Visual Effects
14	Water Resources
15	Cumulative Impacts
16	Irreversible and Irrecoverable Commitment of Resources

Within each impact category chapter, there are generally four sections: Regulatory Setting, Affected Environment, Environmental Consequences, and Mitigation. Some impact categories have additional sections, as appropriate. To effectively use this Desk Reference, first become familiar with the material contained in each impact category chapter.

The Regulatory Setting section presents applicable Federal statute(s), regulations, orders, and other relevant guidance. Additional details on these statutes, regulations, orders, and other guidance can be found in Appendix B. Should a proposed Federal action have a potential air quality impact, for example, review the Air Quality chapter of this Desk Reference and the appropriate portion of Appendix B to identify the legal requirements for air quality impacts. These requirements are summarized for ease of use; however, if further information is required, the statute, associated implementing regulations, and FAA policy should be reviewed with the Office of the Chief Counsel, Environmental Law Division (AGC-600) and/or Regional Counsel, and through coordination with appropriate Federal and state agency personnel.

The Affected Environment section provides guidance on the documentation of existing environmental conditions of the potentially affected geographic area or areas (i.e., the study area). The study area varies based on the impact category being analyzed; thus, this section describes how to define the existing or baseline environmental conditions in the study area for each impact category.

The Environmental Consequences section provides guidance on the analysis and documentation of impacts. Once the standards and relationship of the requirements to a project are understood, the Significance Determination subsection should be reviewed. This section summarizes the impact thresholds identified in Exhibit 4-1 of FAA Order 1050.1F that are used by the FAA to determine the significance of the impacts of the proposed action and alternative(s) where such thresholds have been established. For example, the FAA has issued guidance in determining the scope and context of potential noise impacts, and thus, whether noise increases are significant and require preparation of an Environmental Impact Statement (EIS). This section also

summarizes the factors to consider when evaluating the significance of potential impacts. The final section, Mitigation, provides guidance on types of mitigation that may be used to reduce the potential impact of the proposed action and alternative(s).

As stated in Paragraph of 4-2.c of FAA Order 1050.1F, “[i]f an environmental impact category is not relevant to the proposed action or any of the reasonable alternatives identified (i.e., the resources included in the category are not present or the category is not otherwise applicable to the proposed action and alternative(s)), this should be briefly noted and no further analysis is required.” Those impact categories that are minimally affected by a project need not be described in detail, but instead should be briefly discussed and dismissed early in the NEPA review. An explanation as to why these impact categories are being dismissed should be provided.

**Direct and Indirect Impacts.** For all environmental impact categories, both direct and indirect impacts must be considered. Direct impacts are those which are caused by the action and occur at the same time and place (see 40 CFR § 1508.8(a)). Examples of direct impacts include:

- construction of a facility or runway in a wetland which results in the loss of a portion of the wetland; or
- noise generated by the proposed action or alternative(s) which adversely affects noise-sensitive land uses.

Indirect impacts are those impacts which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (see 40 CFR § 1508.8(b)). Indirect impacts may include growth-inducing impacts and other effects related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air and water and other natural systems, including ecosystems (see 40 CFR § 1508.8(b)). Major airport development proposals may involve the potential for growth-inducing impacts on surrounding communities. Growth-inducing impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts. In such circumstances, an EIS may be needed. When such potential exists, the NEPA document should describe in general terms such factors.

**Short-term/Temporary Impacts and Long-term/Permanent Impacts.** The impact analysis should distinguish between impacts that would be short-term/temporary, and those that would be long-term/permanent. For example, noise generated as a result of airport construction would constitute a short-term noise impact. In contrast, the operation of a newly constructed runway would have a long-term noise impact on the study area due to ongoing noise from aircraft operations.

# 1. Air Quality

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Air quality is the measure of the condition of the air expressed in terms of ambient pollutant concentrations and their temporal and spatial distribution. Air quality regulations in the United States are based on concerns that high concentrations of air pollutants can harm human health, especially for children, the elderly, and people with compromised health conditions; as well as adversely affect public welfare by damage to crops, vegetation, buildings, and other property.

## 1.1. Regulatory Setting

Under the Clean Air Act (CAA) the U.S. Environmental Protection Agency (EPA) developed the National Ambient Air Quality Standards (NAAQS) for six common air pollutants. These criteria air pollutants are carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), and lead (Pb).<sup>1</sup> The EPA determined that these criteria air pollutants

<sup>1</sup> EPA regulates particulate matter (PM) in two categories, particles with aerodynamic diameters of 10 micrometers or less (PM<sub>10</sub>) and particles with aerodynamic diameters of 2.5 micrometers or less (PM<sub>2.5</sub>).

may harm human health and the environment, and cause property damage. The EPA regulates these pollutants to permissible levels through human health-based (primary standards) and environmental-based (secondary standards) criteria. Exhibit 1-1 lists the primary statute, the CAA, related to air quality. Additional information on the CAA can be found in Appendix B.1. Related topics are covered as well, including designation of areas by air quality status and Conformity.

**Exhibit 1-1. Statute Related to the Protection of Air Quality**

Statute	Location in U.S. Code	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Clean Air Act <sup>2</sup>	42 U.S.C. §§ 7401-7671q	40 CFR parts 6, 9, 50-53, 60, 61, 63, 66, 67, 81, 82, and 93	EPA	Regulates air pollutant emissions from stationary and mobile sources; authorizes EPA to establish NAAQS for criteria pollutants and to regulate HAPs.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; EPA = U.S. Environmental Protection Agency; HAPs = Hazardous Air Pollutants

According to the CAA, the NAAQS are applicable to all areas of the United States and associated territories. For the poor air quality regions that have ambient concentrations of criteria pollutants above the NAAQS, the EPA has designated these areas as not being in attainment of the NAAQS, or “nonattainment areas.” Each nonattainment area is required to have an applicable State Implementation Plan (SIP) that prescribes mitigation measures and timelines necessary to bring ambient concentrations of criteria pollutants below the NAAQS. When a nonattainment area attains the NAAQS, EPA designates the area as a “maintenance area” because the applicable SIP ensures that the ambient concentrations of criteria pollutants do not increase above the NAAQS again. For aviation-related Federal actions planned to occur in a nonattainment or maintenance area, the proposed impacts to air quality must conform to the conditions of the applicable SIP, also known as General Conformity. The steps of General Conformity are addressed later in this chapter, and further detail is provided in Appendix B.1.

### 1.1.1. Permits

To be in compliance with Federal or state requirements, a project may be required to obtain certain permits or approvals before the project can be implemented. For example, airport projects, particularly those that involve stationary air pollutant sources (e.g., boilers or power plants at airports), may be subject to permitting, certification, or approval under other provisions of the CAA and/or state and/or local regulations. A list of all required permits and licenses should be included in a NEPA document along with an indication of their issuance date. For additional information on the EPA’s Air Permit Programs, see the EPA’s Air Quality Planning and Standards, Air Permit Programs website at: <http://www.epa.gov/airquality/permjmp.html>.

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Nitrogen oxides (NO<sub>x</sub>) are defined as the combination of nitrogen dioxide (NO<sub>2</sub>) and nitrogen monoxide (NO). Both NO<sub>x</sub> and volatile organic compounds (VOC) are precursors of O<sub>3</sub>.

<sup>2</sup> <http://www.epa.gov/lawsregs/laws/caa.html>.

### **1.1.2. State/Local Air Quality Requirements**

In addition to Federal requirements, there often are state and/or local air quality requirements that are applicable to a project. These requirements vary widely from location to location, and should be addressed on a project-by-project basis. Examples of state or local air quality requirements that may be applicable are more stringent state and local ambient air quality standards, Federally-approved state general conformity rules, and indirect source thresholds. Applicable state and local requirements should be identified as early as possible during the NEPA scoping process and described in the NEPA documentation.

### **1.1.3. Indirect Source Review**

Each project should assess whether additional investigation of indirect sources is required by state or local regulations. The definition of indirect source may vary from state to state. Indirect sources may include airports and commercial space launch sites as well as highways, parking facilities, sports and entertainment facilities, and office buildings. Any applicable indirect source requirements should be identified as early as possible during the NEPA scoping process and described in the NEPA documentation.

Some states require indirect source review (ISR) as part of their SIP when proposed Federal actions are located in nonattainment or maintenance areas. States that require ISR generally establish thresholds for property, road, or parking areas that attract motor vehicle traffic and, indirectly, causes pollution. For example, a state may require ISR for all projects that increase total airport passengers at an airport by more than 100,000 passengers per year, add 1,000 new parking spaces, or increase aircraft operations by 1,000 per year. Projects that exceed the thresholds could be required to complete an indirect source analysis and obtain an indirect source permit.

### **1.1.4. Consultation Processes**

Consultation with state or local air quality agencies, as well as EPA regional offices, may be necessary when conducting the air quality analysis. For example, as mentioned below in Section 1.3.5.3, if the FAA needs to make a General Conformity determination, the FAA may need to consult with the EPA regional office and/or the state or tribal air permitting agency early in the environmental review process to discuss which General Conformity determination criteria to use and to identify the most up-to-date models and emissions data for a conformity analysis.

Typically this type of consultation is provided in an air quality modeling protocol document, which outlines to the reviewing agencies the proposed approach to demonstrate compliance with all applicable air quality rules and requirements.

## **1.2. Affected Environment**

The study area for air quality should be defined as the entire geographic area that could be either directly or indirectly affected by the proposed project. For example, air quality impacts from construction may be limited to a project site and immediate adjacent areas. However, air quality impacts from operations (e.g., aircraft flight) may extend beyond a project site and immediate adjacent areas, and extend vertically up to the mixing height. Dispersion of air pollutants can be

affected by meteorology, topography, the type of pollutant, and other factors. In addition, a Federal action can lead to air pollutant emissions that may occur at some distance from a project site, such as exhaust from project-generated vehicle traffic on the surrounding road network. Therefore, the study area for a project's air quality analysis could encompass many square miles and/or multiple air basins.

When discussing the existing conditions in the study area, refer to the following:

- The current NAAQS;
- Applicable state ambient air quality standards;
- The attainment status(es) of the study area;
- A summary of recent measured air pollutant concentrations, if there are any monitoring sites in the region that are representative of conditions in the study area;
- A brief description of the meteorological and topographical conditions of the study area and an indication of whether these conditions could hinder the dispersal of air pollutant emissions in the study area;
- Other conditions in the study area if relevant to air quality, e.g., local land use or large emission sources nearby. For many Federal actions, discussion of such other conditions may not be needed; and
- List or table of existing permits;
- List or table of new permits that may be required by the action;
- For commercial space launch actions, a brief description of the affected layers of the atmosphere (e.g., troposphere, stratosphere, mesosphere, ionosphere).<sup>3</sup>

See Appendix B.1 for electronic sources that may be useful when describing the affected environment for air quality.

### 1.3. Environmental Consequences

The FAA has a responsibility under NEPA to include in its Environmental Assessment's (EA's), Environmental Impact Statements (EIS's), and, when appropriate, Categorical Exclusion's (CATEXs), sufficient analysis to disclose the extent of a project's impact on the attainment and maintenance of the NAAQS and any applicable state air quality standards. Thus, a project's impact on air quality is assessed by evaluating whether it would cause a new violation of a NAAQS or contribute to a new violation in a manner that would increase the frequency or severity of the new violation.

The Environmental Consequences section of a NEPA document is where the potential impacts of the Federal action on air quality are disclosed. Very small projects sometimes can be evaluated qualitatively or by comparison to a previous project for which a quantitative air quality analysis is available. However, if a project requires the preparation of an EA or EIS, it is likely that a quantitative, project-specific air quality assessment would be needed. This can be accomplished by first identifying the emissions sources associated with a project, and then estimating the

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<sup>3</sup> Note: There are no air quality standards for impacts above the mixing height.

emissions for each reasonable alternative. Knowing the emissions may help to characterize a project's impact for the EA or EIS. Larger or more complex projects may require further modeling analysis to estimate changes in ambient pollutant concentrations that would result from the Federal action emissions. From the pollutant concentrations analysis, compare the emissions (or model output) of a project directly to the NAAQS. Additionally, emissions and air quality impacts may be relevant to other impact categories due to mechanisms such as deposition of emitted pollutants to soil or surface water. The air quality analysis should be coordinated with other impact categories to account for such potential impacts as necessary.

### 1.3.1. Applicable Guidance References

The FAA's Air Quality Handbook provides information on how to conduct an air quality analysis at: [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/airquality\\_handbook/](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook/). Additional guidance materials that may be useful include:

- For Hazardous Air Pollutants (HAPs), FAA's "Guidance for Quantifying Speciated Organic Gas Emissions from Airport Sources" at: [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/media/Guidance%20for%20Quantifying%20Speciated%20Organic%20Gas%20Emissions%20from%20Airport%20Sources.pdf](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/Guidance%20for%20Quantifying%20Speciated%20Organic%20Gas%20Emissions%20from%20Airport%20Sources.pdf);
- For airport projects, the FAA *Airports Desk Reference, Chapter 1, Air Quality* at: [http://www.faa.gov/airports/environmental/environmental\\_desk\\_ref/media/desk\\_ref\\_chap1.pdf](http://www.faa.gov/airports/environmental/environmental_desk_ref/media/desk_ref_chap1.pdf);
- Information provided on the website of the EPA Office of Transportation and Air Quality at: <http://www.epa.gov/otaq/index.htm>; and
- The Transportation Research Board's Airport Cooperative Research Program documents may not represent official FAA guidance. Consult the FAA's Office of Environment and Energy (AEE) before relying on these materials and referring to handbooks, guidance, and research results issued by the National Academy of Sciences' Transportation Research Board, *Airport Cooperative Research Program* at: <http://www.trb.org/ACRP>.

### 1.3.2. Emissions Inventory

An emissions inventory provides a first indication of the magnitude of the action's potential air quality impact. The emission inventory provides the total amount or mass of pollutants generated by all sources affected by the action during a specified period of time (e.g., tons per year [tpy]). The inventory should start by evaluating the types of criteria pollutants and HAPs that could be emitted from all aspects of a project. Then, provide data on a project's criteria pollutant emissions (and HAPs, and ozone-depleting substances [ODS], if state requires) for each reasonable alternative. An inventory should include both direct and indirect emissions that are reasonably foreseeable which could include construction as well as operational emissions. Direct and indirect emissions are further defined in Section B.1.1.4 of Appendix B. The emissions (or the net emissions for a general conformity analysis) of an action alternative is the difference between the emissions under that alternative and the emissions under the no action alternative for that same calendar year.

The emissions inventory usually is calculated for the year(s) of project implementation, the planning horizon year(s) in the EA or EIS, and sometimes for intermediate years, if appropriate due to project phasing or if requested by a reviewing agency. Emission inventories must be generated for all project alternatives using an FAA-approved model.

Commercial space launch actions may involve commercial space launch vehicle emissions that can affect the atmosphere in specific altitude ranges. Emissions inventories for commercial space launches may need to include calculation of emissions by atmospheric layer (troposphere below 3,000 feet, troposphere above 3,000 feet, stratosphere, mesosphere, and ionosphere, or other classification as appropriate) to define such impacts.

See Section 1.3.5 for emission inventory requirements pertaining to Federal actions located in nonattainment or maintenance areas for General Conformity purposes.

### **1.3.3. Ambient Pollutant Concentrations Analysis**

There is no single, universal criterion for deciding whether an ambient pollutant concentrations analysis (or “NAAQS analysis”) is necessary for Federal actions. However, a review of a project to identify any unusual circumstances, such as intense emission sources in close proximity to areas where the public has access, might indicate a need for further analysis. In addition, reviewing agencies may specifically request a NAAQS analysis if concerns exist regarding sensitive receptors surrounding the Federal action or if measured ambient concentrations of regulated pollutants are very close to violating a NAAQS in the immediate vicinity of the Federal action. Based on the nature of a project and consultation with state and local air quality agencies, additional analysis may be appropriate.

If a NAAQS analysis is conducted, calculate the estimated pollutant concentration for a project using the emissions inventory data and an FAA-approved dispersion model. Depending on the project, this step can require extensive data and computation. This should include collection of the latest available input data early in the environmental process. Assistance from AEE is available on a case-by-case basis by request through the respective headquarters program office. After performing dispersion modeling of the project emissions sources, add the modeled pollutant concentrations to the background (existing) pollutant concentrations and compare to the NAAQS. If modeled concentrations combined with background concentrations do not result in projected exceedances of the NAAQS, then the analysis is complete. If modeled concentrations and background concentrations combine to exceed the NAAQS in an attainment area, emissions should be mitigated or offset, or the action redesigned to reduce concentrations below the NAAQS, to the extent possible. The FAA [Air Quality Handbook](#)<sup>4</sup> provides further information on air quality dispersion modeling.

See Section 1.3.5 for ambient pollutant concentration analysis requirements pertaining to Federal actions located in nonattainment or maintenance areas for General Conformity purposes.

### **1.3.4. Modeling Requirements**

As per FAA Order 1050.1F, when conducting an air quality analysis for the purposes of complying with NEPA or General Conformity, the FAA requires use of an FAA-approved

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<sup>4</sup> Available at [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/airquality\\_handbook](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook)



model. For air quality, the approved model is Aviation Environmental Design Tool (AEDT) . The Guidance on the use of AEDT can be found in Appendix C, Using AEDT to Conduct Environmental Modeling for FAA Actions Subject to NEPA, of this Desk Reference.

Per FAA Order 1050.1F, air quality analyses must use the most recent version of the FAA-approved model available at the start of the environmental analysis process. In the event that the FAA-approved model is updated after the environmental analysis process is underway, the use of an updated version of the model is acceptable but is not required. Consultation with the appropriate FAA program office is recommended to help decide whether to use an updated version of the FAA-approved model after the environmental analysis process is underway. A complete description of all inputs, particularly the specification of custom values if the model's default values are not used, should be included in the documentation of the air quality analysis. Per FAA Order 1050.1F, if the analysis is conducted by a contractor or applicant, the FAA must be provided with one copy of the input files used in the analysis and the corresponding output files on media specified by the FAA.

#### HAPs inventory

If a HAPs inventory is required by the state, the FAA-approved AEDT model must be used. If the state or local air quality agencies request to supplement the analysis with other HAPs methodology(s) and/or model(s), then the HAPs inventory should be conducted in consultation with the appropriate Line of Business/Staff Office (LOB/SO) and AEE.

#### Supplemental methodologies or models

Use of supplemental methodology and models for analysis of non-aviation sources is also permitted in consultation with the appropriate LOB/SO and AEE.

For further guidance on air quality procedures, see the FAA *Air Quality Handbook*.

### **1.3.5. General Conformity**

The General Conformity Rule establishes the procedures and criteria for determining whether certain Federal actions conform to state or Federal (EPA) air quality implementation plans (SIPs/FIPs). Hence, the General Conformity Rule is only considered when a Federal action is proposed to occur in an EPA-designated nonattainment or maintenance area. To determine whether conformity requirements apply to a proposed Federal action, consider the following:

- The nonattainment or maintenance status of the area;
- Emissions budget<sup>5</sup> ;
- Exemptions from conformity;
- FAA-specific activities that are presumed to conform (*72 Federal Register* 41565-41580 (July 30, 2007)); and
- Response to emergency or disaster.

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<sup>5</sup> See Air Quality handbook Section 8.1.1. available at [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/airquality\\_handbook](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook)

If the Federal action is subject to EPA's General Conformity Rule (see 40 CFR part 93), then the general conformity requirements should be integrated into the NEPA process. General conformity requirements are distinct from NEPA requirements. For example, NEPA may require the FAA to analyze several alternatives in detail. If a general conformity determination is required, only the proposed action scenario must be assessed for conformance to the applicable SIP/Federal Implementation Plan (FIP).

The General Conformity Rule has public review requirements independent of NEPA's requirements. However as an efficiency step, the NEPA process could include the issuance of the draft general conformity determination along with any NEPA document for public comment<sup>6</sup>. While for some decisions there may be valid reasons to address general conformity separately rather than concurrently, when general conformity analysis provides information that is essential to a reasoned choice among alternatives, then a complete general conformity analysis should be performed and the final general conformity determination should be issued along with the final NEPA document. The practitioner should be mindful that the general conformity analysis can supplement the NEPA air quality analysis but usually does not, by itself, provide a fully NEPA-compliant air quality analysis<sup>7</sup>.

The general conformity process is conducted in three phases: applicability, evaluation, and determination. The applicability phase has two parts. First, determine if the proposed Federal action is located in an EPA-designated nonattainment or maintenance area for one or more of the regulated criteria pollutants. If it is not, then the general conformity rule does not apply. If it is, then the next part is to determine whether the Federal action is exempt from the general conformity rule or otherwise does not require further analysis to demonstrate conformity. Actions that require further analysis to demonstrate conformity proceed to the evaluation phase. The evaluation phase requires estimating the changes in emissions caused by the action and comparing them to the *de minimis* thresholds. The change in emissions is the "proposed action emission levels" minus the "no action emission levels," also known as the "net emissions" for a specific calendar year in tpy. If the net emissions due to the action exceed the *de minimis* threshold, and are not otherwise exempt or PTC, then the determination phase must be applied and a formal conformity determination must be prepared.

The General Conformity Rule establishes the *de minimis* levels to identify those actions with the potential to have air quality impacts large enough to require a conformity determination. If a project's net emissions are less than the *de minimis* levels, then the Federal action is considered to be too small to adversely affect the air quality status of the area and is automatically considered to conform with the applicable SIP/FIP, therefore the general conformity requirements have been complied with and the process is complete.

#### **1.3.5.1. Applicability**

For areas that have violated the NAAQS, the CAA requires each state to adopt a plan to achieve the NAAQS for each pollutant within the established timeframes. These air quality plans, known

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<sup>6</sup> For more information refer to Section 8.1.3 Interagency and Public Review subsection for General Conformity of the FAA's *Aviation Emissions and Air Quality Handbook Version 3*

<sup>7</sup> For more information refer to Section 8.1 General Conformity of the FAA's *Aviation Emissions and Air Quality Handbook Version 3*

as SIPs, are subject to EPA approval to be deemed as the “applicable SIP” for the nonattainment or maintenance area. In default of an approved SIP, the EPA is required to promulgate a FIP. Section 176(c) of the CAA, as amended in 1990, requires that Federal actions conform to the appropriate FIPs or SIPs in order to attain the CAA’s air quality goals. Section 176(c) states: “No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan.”

The first phase of the general conformity process, *applicability*, evaluates whether the conformity regulations would apply to a proposed Federal action. Before the FAA can fund, support, or approve an activity in any way, it must address the conformity of the action with the applicable SIP, FIP, or Tribal Implementation Plan using the criteria and procedures prescribed in the General Conformity Rule. Details on conformity applicability can be found in Section 8.1.1 General Conformity – Applicability Analysis of the FAA’s *Aviation Emissions and Air Quality Handbook Version 3*.

### **1.3.5.2. Evaluation and Analysis Thresholds**

In the second phase, estimate the total annual emissions of the pollutant(s) of concern from the proposed action or alternative(s) and from the no action alternative. In other words, if a Federal action is not exempt or presumed to conform, a project’s emissions must be analyzed with regard to conformity applicability emission levels. The rule established the threshold emission levels (annual threshold levels) to identify those actions with the potential to have significant air quality impacts. Include both direct and indirect emissions, and account for construction emissions in determining whether emission threshold levels are exceeded (EPA General Conformity Questions and Answers, November 1994).

If there are parts of a project that are exempt from conformity requirements or are presumed to conform, do not include those parts in the analysis. Subtract the proposed action emissions from the no action emissions to derive the difference in emissions, or net emissions, due to the action. Compare the net emissions to the *de minimis* thresholds that apply to the nonattainment or maintenance area. If the estimated net emissions are less than the applicable *de minimis* thresholds, the conformity determination requirements do not apply to a project.

The conformity determination process can be resource-intensive. If the net emissions exceed the *de minimis* thresholds, then before proceeding with a conformity determination, review the emissions analysis to identify any assumptions or data that might be overly conservative (tending to overestimate emissions). More refined analysis may show that the net emissions would not exceed the *de minimis* thresholds. If after refinement the net emissions still exceed the thresholds, investigate whether there are opportunities to redesign the project for lower emissions or to include measures that would reduce emissions increases to less than the *de minimis* levels (for example, consider the mitigation measures listed below in Section 1.4). If these measures are incorporated into the project design and a project commits to their implementation, they can then be included in the emissions analysis to show that the net emissions would not exceed the *de minimis* thresholds, and a formal conformity determination would not be required. If after consideration of emission reductions and design changes, the net emissions still exceed the thresholds, then a conformity determination must be prepared.

### ***Conformity Determination***

If a conformity determination is required, it need be conducted for the proposed action only, in contrast to the NEPA review which must be conducted for all alternatives. EPA's conformity guidance<sup>8</sup> reflects the requirement to conduct a conformity determination for the proposed action only, stating that when needed, a conformity determination is required for "only the one [alternative] that the Federal agency ultimately approves, permits, or funds." In some cases the FAA's proposed action may differ from the alternative that an airport or commercial space launch site has identified as its preferred alternative. In such cases consult with the appropriate FAA program office to confirm the alternative(s) for which the conformity evaluation should be performed. When a proposed Federal action is not exempt, presumed to conform, or exceeds *de minimis* emission threshold, the agency must prepare a conformity determination based on analysis using criteria stated in EPA's General Conformity Rule (40 CFR part 93, 58 *Federal Register* 63250, (November 30, 1993)). A proposed action cannot be approved or initiated unless conformity does not apply, if the action is presumed to conform, or if emissions are less than the *de minimis* thresholds. If initial analysis does not indicate a positive conformity determination, alternative actions (including mitigation measures as part of the action) should be considered and further consultation, analysis, and documentation would be necessary.

To begin the third phase, identify which approaches, or criteria, could be used to demonstrate that the proposed action conforms to the applicable implementation plan. Consult with AEE and the EPA regional office and/or the state or tribal air permitting agency, as appropriate, early in the process to discuss which conformity determination criteria to use and to identify the most up-to-date models and data for the conformity analysis.

#### ***1.1.1.1 Approaches to Demonstrating General Conformity***

The General Conformity Rule provides eight basic approaches or criteria for demonstrating conformity with the applicable implementation plan:

1. Document that the emissions from the action are specifically identified and accounted for in the implementation plan (see 40 CFR § 93.158(a)).
2. Obtain a statement from the applicable state, tribal, or local air quality agency that the emissions from the action along with all other emissions in the area do not exceed the budget for those emissions in the implementation plan (see 40 CFR § 93.158(a)).
3. Have the state or tribe agree to revise the implementation plan to include the emissions from the Federal action (see 40 CFR § 93.158(a)).
4. Have the local Metropolitan Planning Organization provide a statement that the emissions are included in the modeling for a conforming transportation plan and program (see 40 CFR § 93.158(a)).
5. Conduct air quality modeling to demonstrate that the emissions will not cause or contribute to a violation of the NAAQS (see 40 CFR § 93.158(a)). This modeling option is allowed for demonstrating general conformity of directly-emitted pollutants only. The EPA does not believe that current models are adequate to reasonably predict a project-level impact of

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<sup>8</sup> "General Conformity Guidance: Question and Answers," issued by the Office of Air Quality Planning and Standards, U.S. EPA, July 13, 1994.

individual sources of precursors of O<sub>3</sub> or the volatile portion of PM<sub>2.5</sub> (see the preamble to the 2010 conformity rule amendments, *75 Federal Register* 17254, (April 5, 2010)).

6. Fully mitigate or offset<sup>9</sup> the increase in emissions (see 40 CFR §§ 93.158(a) and 93.160).
7. Develop and implement a facility-wide emission budget. This approach requires a revision to the applicable implementation plan as in approach 4 above. If the net emissions from the Federal action along with the other emissions from the facility do not exceed the budget, then the Federal action is presumed to conform (see 40 CFR § 93.161).
8. Create and apply emission reduction credits. Credits must meet several requirements in order to be eligible for use in a conformity determination (see 40 CFR § 93.165).

The general conformity analysis procedures contain detailed technical requirements for demonstrating how an action would conform to the applicable implementation plan under these approaches (see 40 CFR § 93.159). Additional guidance can be found at the following locations:

- EPA's interpretation of the General Conformity Rule and answers to common general conformity questions, including a training module, is provided on EPA's General Conformity website at: <http://www.epa.gov/oar/genconform/faq.html>;
- On EPA's Office of Air and Radiation website, *General Conformity Guidance for Airports: Questions and Answers*, dated September 25, 2002 at: [http://www.epa.gov/ttn/caaa/conform/airport\\_qa.pdf](http://www.epa.gov/ttn/caaa/conform/airport_qa.pdf); and
- Guidance documents also can be obtained from the appropriate EPA Regional Office.

#### **1.1.1.1.2 Draft General Conformity Documentation**

After conducting the conformity analysis, prepare a draft general conformity determination. The EPA general conformity regulations require the FAA to distribute a description of the proposed action and the draft general conformity determination, in the form of a 30-day notice to the appropriate EPA Regional Office(s), state and local air quality agencies, tribes, and, when applicable, affected Federal land managers, and the agencies designated under Section 174 of the CAA to develop the applicable implementation plan(s). In addition, the draft general conformity determination and supporting materials that describe the analytical methods and assumptions must be made available to any person upon request. To coordinate the general conformity requirement with the NEPA process, for both a draft EIS or a draft EA issued for public comment, include the draft general conformity determination in an appendix to the NEPA review and consider expanding the NEPA distribution to include the agencies indicated above and any members of the public who request copies of the draft general conformity determination.

- For an EIS, if the need for a general conformity determination is identified before the Notice of Intent (NOI) to prepare an EIS is issued, state in the NOI that preparation of the EIS and general conformity determination will be coordinated. This will alert the public to consider conformity issues with the applicable implementation plan in the public scoping process for the EIS.

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<sup>9</sup> FAA's *Aviation Emissions and Air Quality Handbook Version 3, Section 8.1.2.2 General Conformity – Emissions Mitigation and Offsetting*

- For an EA that will be issued for public comment, if the need for a general conformity determination is identified before notifying the host state(s) and tribe(s), potentially affected state(s) and tribe(s), and other stakeholders of the FAA's determination to prepare an EA, state in the notice that preparation of the EA and the CAA general conformity determination will be coordinated.

The EPA general conformity regulation also requires the FAA to announce the availability of the draft conformity determination for public review and comment by placing a prominent advertisement in a daily newspaper in the affected area of the proposed action. In all public notices inviting comment on a draft general conformity determination, also specifically invite comment on the draft EIS or EA, and vice versa.

As mentioned above, the EPA general conformity regulations require a minimum 30-day public comment period on a draft general conformity determination.

- For an EIS, the comment period for the draft general conformity determination can readily fit within the minimum 45-day public comment period for the draft EIS. Therefore, to the extent practicable, establish the public comment periods for the draft EIS and draft general conformity determination to occur concurrently. If the FAA publishes a Notice of Availability (NOA) for the draft EIS in the *Federal Register*, the FAA should announce the availability of the draft general conformity determination in the notice.
- For an EA that is being provided to the public for comment, set the review period for at least 30 days. If an EA is not being provided to the public for review, establish, to the extent possible, concurrent periods for public comment on the draft conformity determination and a state and tribal review period for the EA, as applicable.

#### ***1.1.1.1.3 Final General Conformity Documentation***

After the public comment period, prepare a final general conformity determination. The final general conformity determination documents the FAA's finding that an action would conform to the applicable implementation plan. The determination describes how the conformity determination criteria would be met, the results of any conformity analysis conducted, and any mitigation measures, offsets, or emission reduction credits needed to demonstrate conformity with the applicable implementation plan. Any statements that the action's emissions are or will be included in the applicable implementation plan must be documented. Any mitigation measures, offsets, or credits must be identified and the process for their implementation and enforcement must be described, including an implementation schedule. Prior to determining that the Federal action is in conformity, the FAA must obtain written commitments to implement any measures that have been identified as conditions in order for making the general conformity determination. Written commitments could come in the form of a NEPA Record of Decision (ROD) or by a separate commitment document. Reference 40 CFR § 93.160 for further details on mitigation and documentation requirements.

The EPA general conformity regulations require the FAA to notify, within 30 days after a final general conformity determination, the appropriate EPA Regional Office(s), state and local air quality agencies, tribes, and, when applicable, affected Federal land managers, the agencies designated under Section 174 of the CAA to develop the applicable implementation plan(s), and the Metropolitan Planning Organization. In addition, the general conformity regulations require that the FAA make comments and responses on the draft general conformity determination

available, upon request by any person, within 30 days of the final general conformity determination. For a final EIS and an approved EA and Finding of No Significant Impact (FONSI), provide copies of the NEPA review to the Federal, state, and local agencies that require copies of the final general conformity determination, and any persons who requested copies of the draft general conformity determination.

The EPA general conformity regulations also require that the FAA make public its final general conformity determination by placing a prominent advertisement in a daily newspaper in the area affected by the action, within 30 days of the final general conformity determination. For both a final EIS and an approved EA and FONSI, publish an announcement of the availability of the NEPA review and final general conformity determination in the local newspaper within 30 days after a final general conformity determination. In addition, if the FAA publishes an NOA for the final EIS in the *Federal Register*, the notice also should announce the availability of the general conformity determination.

The NEPA document should include information concerning the general conformity review. Maintain documentation of the consultation process as part of the official administrative record for a project.

### **1.3.6. Significance Determination**

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for air quality:

*The action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the Environmental Protection Agency under the Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.*

## **1.4. Mitigation**

Some examples of potential measures to mitigate air quality impacts from the proposed action or alternative(s) include but are not limited to the following:

- Implementing single or reduced engine taxiing (to the extent not already implemented) to reduce emissions;
- For airport project sponsors in nonattainment and maintenance areas, participating in the FAA Voluntary Airport Low Emissions (VALE) program;
- Providing 400 Hz power and preconditioned air at gates to minimize or eliminate the use of auxiliary power units when an aircraft is parked;
- Replacing ground support equipment that operates on conventional fuels with equipment that operates on alternative fuels with lower emissions (e.g., natural gas) or that operates on electricity;
- Implementing dust abatement techniques (e.g., water application) on unpaved or unvegetated surfaces to minimize airborne dust during construction;
- Revegetating disturbed areas as soon as possible after disturbance. This could include interim revegetation along road beds, once heavy construction is completed; and
- Covering construction materials and stockpiled soils if they are a source of fugitive dust.

Section 8 of the FAA *Air Quality Handbook* provides additional mitigation measures that may be considered to mitigate air quality impacts.

In addition, during the NEPA process agencies having jurisdiction or special expertise regarding air quality might provide letters addressing air quality impacts. These letters may include recommended measures to mitigate air quality impacts under NEPA (beyond those required to comply with applicable substantive requirements under the CAA) that may be considered for incorporation into a proposed project.



## 2. Biological Resources

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Biological resources are valued for their intrinsic, aesthetic, economic, and recreational qualities and include fish, wildlife, plants, and their respective habitats. Typical categories of biological resources include:

- terrestrial and aquatic plant and animal species;
- game and non-game species;
- special status species (state or Federally-listed threatened or endangered species, marine mammals, or species of concern, such as species proposed for listing or migratory birds); and environmentally-sensitive or critical habitats

## 2.1. Regulatory Setting

Exhibit 2-1 lists the primary statutes, regulations, Executive Orders, and other guidance related to biological resources. See Appendix B.2 for more detailed information about these requirements.

**Exhibit 2-1. Statutes, Regulations, Executive Orders, and other Guidance Related to the Protection of Biological Resources**

Statute, Executive Order, or other Guidance	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Bald and Golden Eagle Protection Act	16 U.S.C. § 668 et seq.	50 CFR part 22	USFWS	Protects bald and golden eagles from the unauthorized capture, purchase, or transportation of the birds, their nests, or their eggs.
Endangered Species Act	16 U.S.C. §§ 1531-1544	50 CFR parts 17 and 402	USFWS; NMFS	Requires all Federal agencies to seek to conserve threatened and endangered species. Section 7(a)(2) requires Federal agencies, in consultation with the Services (USFWS and/or NMFS), to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.
Fish and Wildlife Coordination Act	16 U.S.C. §§ 661-667d	Not applicable	USFWS	Requires that Federal agencies consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed Federal projects may result in control or modification of the water of any stream or other water body.
Magnuson-Stevens Fishery Conservation and Management Act	16 U.S.C. § 1801 et seq.	50 CFR part 600	NMFS	Governs the conservation and management of ocean fishing, including essential fish habitat.
Marine Mammal Protection Act	16 U.S.C. § 1361 et seq.	50 CFR parts 18 and 216	NMFS, USFWS	Protects all marine mammals and prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens on the high seas.
Migratory Bird Treaty Act	16 U.S.C. § 703 et seq.	50 CFR part 21	USFWS	Protects migratory birds by prohibiting private parties (and Federal agencies in certain judicial circuits) from intentionally taking, selling, or conducting other activities that would harm migratory birds, their eggs, or nests (such as removal of an active nest or nest tree), unless the Secretary of the Interior authorizes such activities under a special permit.

Statute, Executive Order, or other Guidance	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Executive Order 13112, Invasive Species	64 <i>Federal Register</i> 6183, (February 8, 1999)	Not applicable	Not applicable	Federal agencies whose actions may affect the status of invasive species are directed to use relevant programs and authorities, to the extent practicable and subject to available resources, to prevent the introduction of invasive species, and to provide for the restoration of native species and habitat conditions in ecosystems that have been invaded. Agencies are directed not to carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species unless the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures to minimize risk of harm are taken.
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds	66 <i>Federal Register</i> 3853, (January 17, 2001)	Not applicable	Not applicable	Directs Federal agencies to take action to further implement the Migratory Bird Treaty Act.
CEQ Guidance on Incorporating Biodiversity Considerations Into Environmental Impact Analysis Under the National Environmental Policy Act (January 1993)	Not applicable	Not applicable	Not applicable	In accordance with 40 CFR §§ 1507.2(e), 1508.8(b), and 1508.27, this guidance directs Federal agencies to consider the effects of Federal actions on biodiversity to the extent that is possible to both anticipate and evaluate those effects. The guidance outlines the general principles and discusses the importance of context – that is, examining the direct, indirect, and cumulative impacts of a specific project in the regional or ecosystem context.
Memorandum of Understanding to Foster the Ecosystem Approach (December 1995)	Not applicable	Not applicable	Not Applicable	The MOU emphasizes consideration of all relevant and identifiable ecological and economic consequences both long term and short term; coordination among Federal agencies; partnership; communication with the public; efficient and cost-effective implementation; use of best available science; improved data and information management, and responsiveness to changing circumstances. The MOU was signed by Council on Environmental Quality, all U.S. Departments, Environmental Protection Agency, and Office of Science and Technology Policy.

<sup>a</sup>U.S.C. = United States Code; CFR = Code of Federal Regulations; USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; CEQ = Council on Environmental Quality; MOU = Memorandum of Understanding

## 2.1.1. Consultations, Permits, and Other Approvals

This section contains a detailed explanation of the consultations, permits, and authorizations that could be required under the Endangered Species Act (ESA) (Section 2.1.1.1), the Marine Mammal Protection Act (MMPA) (Section 2.1.1.2), and the Magnuson-Stevens Fishery Conservation and Management Act (Section 2.1.1.3). See Appendix B.2 for brief explanations of potential consultation obligations under the other requirements summarized in Exhibit 2-1.

### 2.1.1.1. Endangered Species Act

The most common consultation when analyzing potential impacts to biological resources is Section 7 consultation with the USFWS and/or the NMFS (collectively known as “the Services”) under the ESA. Under Section 7, if the FAA determines that an action *may affect* a threatened or endangered species, the FAA must initiate consultation with USFWS (for terrestrial and freshwater species) or NMFS (for marine and anadromous species), as appropriate, to ensure that any action the FAA authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally-listed threatened or endangered species or result in the destruction or adverse modification of critical habitat. Some common definitions used in the ESA consultation process are presented below.

#### *ESA Consultation Terms and Definitions*

**Action area** – A project area applicable to ESA consultation. The action area is defined as all areas to be affected directly or indirectly by the FAA action and not merely the immediate area involved in the action (see 50 CFR § 402.02).

**Biological Assessment** – A Biological Assessment should be prepared when an action could:

- adversely affect listed species or designated critical habitat;
- jeopardize the continued existence of species that are proposed for listing; or
- adversely modify proposed critical habitat.

The FAA is required to prepare a Biological Assessment for all “major construction activities” (see 50 CFR § 402.12(b)).

**Biological Opinion** – A document prepared by the Services that explains their determination regarding whether the FAA action is likely to result in jeopardy to an endangered or threatened species or result in destruction or adverse modification of its designated critical habitat. The Biological Opinion includes a summary of the information on which the opinion is based, and a detailed discussion of the effects of the action on listed species or critical habitat. A Biological Opinion normally includes an *incidental take statement* which describes the amount or extent of anticipated take due to the FAA action, reasonable and prudent measures to minimize the take, and terms and conditions that must be observed when implementing those measures. If the FAA complies with the incidental take statement in implementing the action, the FAA is exempt from the ESA’s Section 9 “take” prohibitions.

**Major Construction Activity** – A construction project (or other undertaking having similar physical effects) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (see 50 CFR § 402.02).

**Take** – Defined under Section 3 of the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct.” Harm is further defined as to “include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing behavioral patterns such as breeding, feeding, or sheltering” (see 50 CFR § 17.3). Harass is defined as “to create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering” (see 50 CFR § 17.3).

***Types of Possible FAA Determinations on Potential Impacts to Listed Species or Critical Habitat***

**No effect** – The appropriate conclusion when the FAA has determined that an action will not affect a listed species or designated critical habitat.

**May affect** – The appropriate conclusion when the FAA has determined that an action may pose **any** effects on listed species or designated critical habitat. When the FAA determines that a “may affect” situation exists, the FAA must either initiate formal consultation with the Services or seek written concurrence from the Services that the action “is not likely to adversely affect” listed species (see definition below).

**Not likely to adversely affect** – The appropriate conclusion when the FAA determines that effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where “take” occurs. Discountable effects are those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

**Likely to adversely affect** – The appropriate FAA conclusion if any adverse effect to listed species may occur as a direct or indirect result of the action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definitions above). If incidental take is anticipated to occur as a result of the action, an “is likely to adversely affect” determination should be made. In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then an “is likely to adversely affect” determination should be made. This determination is typically made by the FAA through the informal consultation process and/or through preparation of a Biological Assessment. An “is likely to adversely affect” determination requires the initiation of formal Section 7 consultation.

***Types of Possible USFWS/NMFS Determinations on Potential Impacts to Listed Species or Critical Habitat***

**Concurrence/Non-concurrence** – The Services determination regarding whether they agree with the FAA’s determination regarding the effects of the action on listed species or designated critical habitat.

**No Jeopardy/No Adverse Modification/Jeopardy/Adverse Modification** – The Services determination, provided in a Biological Opinion, regarding whether the action is likely to jeopardize the continued existence of listed species or result in adverse modification of critical habitat. To jeopardize the continued existence of listed species means that the action reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the

survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (see 50 CFR § 402.02). Destruction or adverse modification of critical habitat occurs when an action results in a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical (see 50 CFR § 402.02).

### ***Types of Consultation under the ESA***

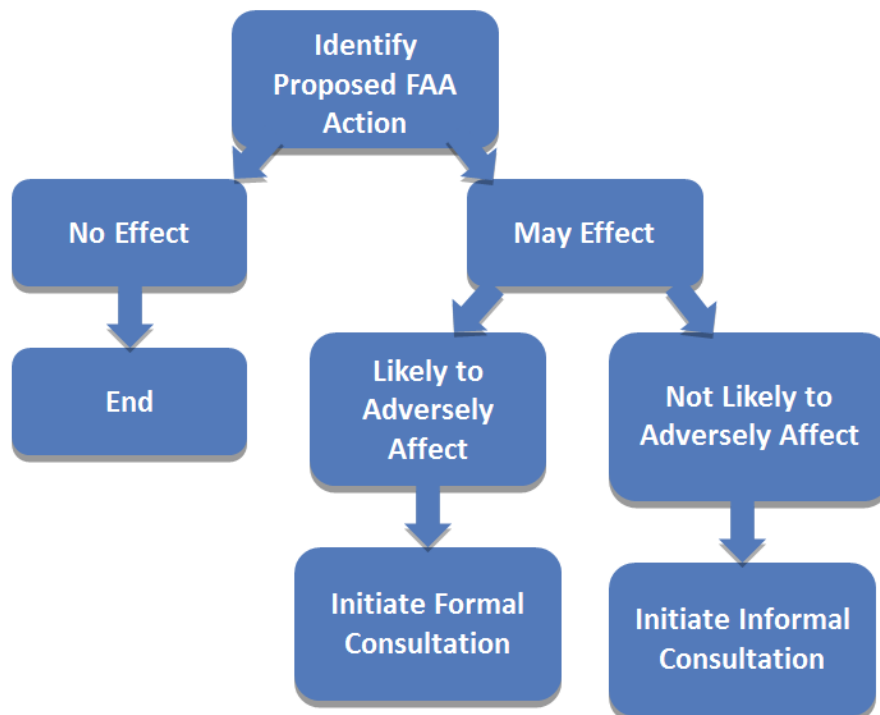
There are three primary types of consultation under the ESA: (1) Informal Consultation; (2) Formal Consultation; and (3) Conference under Section 7(a)(4). These consultation processes are described in more detail below.

### ***Informal and Formal Consultation***

Prior to initiating informal or formal consultation with the Services, there are several steps the FAA must take to determine whether consultation is necessary, and if it is needed, which type of consultation to pursue. The FAA should also coordinate with appropriate USFWS or NMFS field offices to determine if there are specific regional protocols that should be followed. These steps are outlined in Exhibit 2-2 and depicted in Exhibit 2-3 below.

### **Exhibit 2-2. FAA Steps for Determining What Type of ESA Consultation is Necessary**

Step	Action
1	<p>The FAA determines whether any Federally-listed species, candidate species, or critical habitat might be present within the action area. This can be determined through use of the USFWS Information, Planning, and Conservation System (IPaC) website, NMFS Office of Protected Resources (OPR) website or regional NMFS Office websites, or other data sources (such as USFWS county species lists). IPaC can be accessed on the USFWS website at: <a href="http://ecos.fws.gov/ipac/">http://ecos.fws.gov/ipac/</a>. NMFS OPR website can be accessed at: <a href="http://www.nmfs.noaa.gov/pr/species/esa/">http://www.nmfs.noaa.gov/pr/species/esa/</a>.</p> <p>In addition, a letter can be sent to the Services describing the proposed project and the list of species identified on the website to confirm the website is up-to-date. Proceed to Step 2.</p>
2	<p>If Federally-listed species or critical habitats are present in the action area, the FAA determines whether the action would have an effect on the species or habitat.</p> <ul style="list-style-type: none"> <li>• If the FAA determines that the action will have <i>no effect</i> on Federally-listed species or critical habitat, consultation with the Services is <u>not</u> required. The FAA should document this conclusion in the associated NEPA document.</li> <li>• If the FAA determines that the action <i>may affect</i> Federally-listed species or critical habitat, consultation with the Services <u>is</u> required. See Step 3 below.</li> </ul>
3	<p>The FAA determines whether the action is likely to adversely affect Federally-listed species or critical habitat.</p> <ul style="list-style-type: none"> <li>• If the FAA determines that the action is <i>not likely to adversely affect</i> Federally-listed species or critical habitat, the FAA initiates informal consultation with the Services. See Exhibits 2-4 and 2-5.</li> <li>• If the FAA determines that the action <i>is likely to adversely affect</i> Federally-listed species or critical habitat, the FAA initiates formal consultation with the Services. See Exhibits 2-6 and 2-7.</li> </ul>

**Exhibit 2-3. FAA Determination for ESA Consultation Type Flow Chart**

**Informal Consultation.** Informal consultation is designed to assist the FAA in determining whether formal consultation is required. Informal consultation refers to an unstructured approach for coordinating with the Services through phone contacts, meetings, conversations, letters, project modifications, and concurrences that occur prior to initiation of formal consultation. Participants in informal consultation may include the FAA, applicants, or FAA contractors. Note that while Exhibits 2-4 through 2-8 below specify the FAA as the consulting entity, this term is intended to encompass those other entities who may participate on the FAA's behalf in the consultation process. Entities other than the FAA must be designated by the FAA. These designated non-Federal representatives act on its behalf during informal consultation. The person or contractor may also prepare a Biological Assessment on the agency's behalf, but the FAA remains responsible for the Biological Assessment's content and effects finding (see 50 CFR § 402.02).

Exhibits 2-4 and 2-5 below illustrate the informal consultation process.

**Exhibit 2-4. Informal Consultation under the ESA<sup>a</sup>**

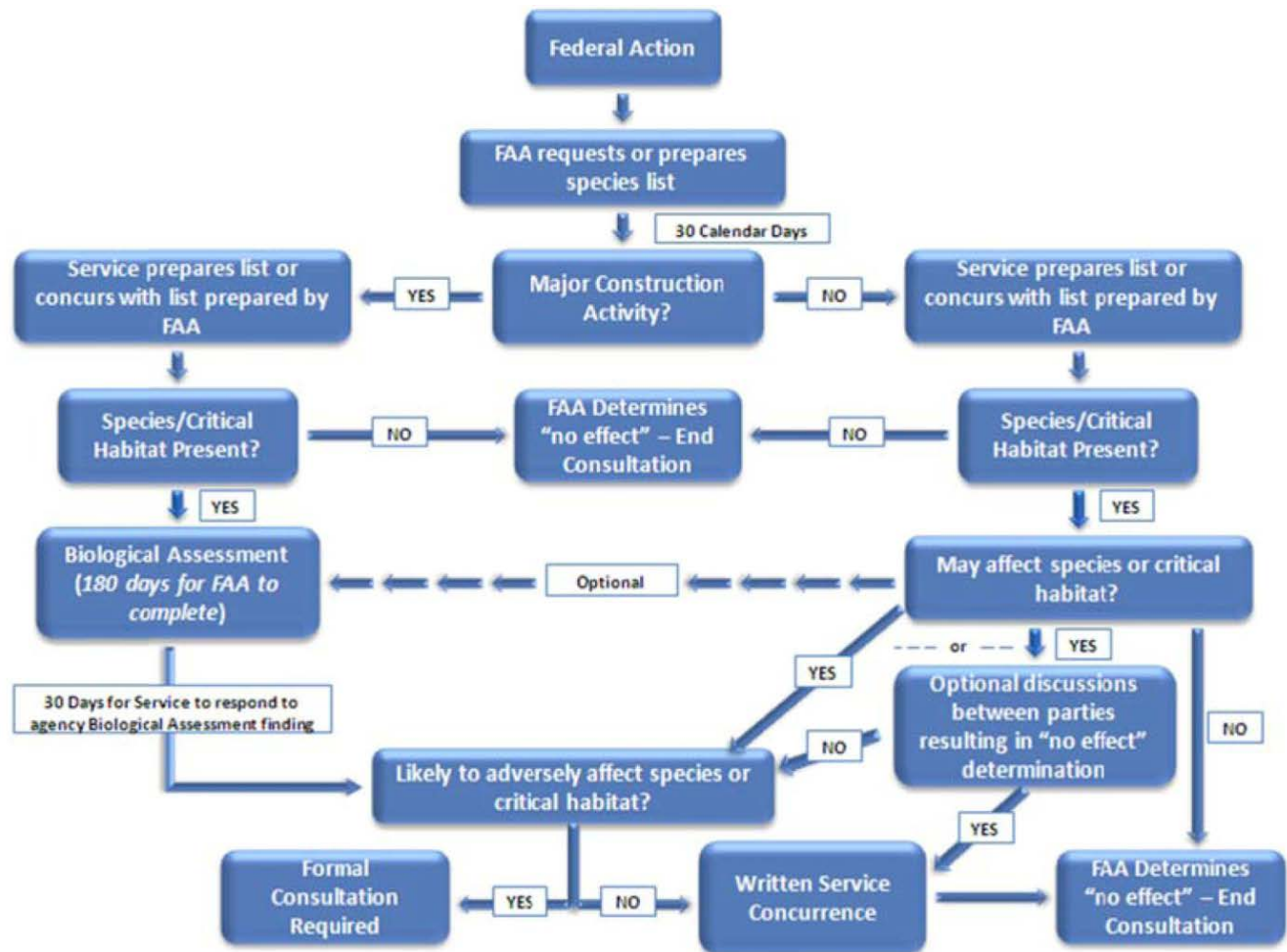
Step	Action
1	If the FAA determines that the action <i>may affect</i> Federally-listed species or critical habitat, consultation with the Services <u>is</u> required and the FAA must analyze the potential effects of the action on Federally-listed species and critical habitat. Proceed to Step 2.
2	<p>The FAA's analysis must determine whether the action is likely to adversely affect Federally-listed species or critical habitat.</p> <ul style="list-style-type: none"> <li>• If the FAA determines that the action <i>may affect, but is not likely to adversely affect</i> the Federally-listed species and/or critical habitat in the action area (i.e., the effects are beneficial, discountable, or insignificant), the FAA may continue the informal consultation process. Proceed to Step 3 for Non-Major Construction Activities or Step 5 for Major Construction Activities.</li> <li>• If the FAA determines that the action <i>may affect, and is likely to adversely affect</i> the Federally-listed species and/or critical habitat in the action area, formal consultation is required. Proceed to Step 1 in Exhibit 2-6.</li> </ul>
3	The FAA sends a letter (or optional Biological Assessment) to the Services that describes the project, includes the list of Federally-listed species and/or critical habitat present within the action area, explains the FAA's reasoning for why the action is not likely to adversely affect the species and/or critical habitat, and requests concurrence with the <i>not likely to adversely affect</i> determination. Proceed to Step 4 (or Step 6 if Biological Assessment is prepared).
4	<p>The Services will reply to the FAA's determination in writing.</p> <ul style="list-style-type: none"> <li>• If the Services concur with the FAA's determination, the informal consultation process ends. Any consultation documentation between the FAA and the Services, including the FAA's determination and Service's concurrence letter, should be included in the FAA's NEPA document.</li> <li>• If the Services do not concur with the FAA's determination, formal consultation is required. Proceed to Step 1 in Exhibit 2-6 below.</li> </ul>
5	The FAA submits a Biological Assessment to the Services which presents the FAA's findings regarding whether the action is likely to adversely affect listed species or critical habitat. If the FAA has requested concurrence on a species list from the Services, the Biological Assessment must be submitted within <b>180 calendar days</b> from the time the FAA receives the Services concurrence letter. Proceed to Step 6.
6	<p>Within <b>30 calendar days<sup>b</sup></b> after receiving the FAA's Biological Assessment, the Services will respond to the Biological Assessment in writing.</p> <ul style="list-style-type: none"> <li>• If the Biological Assessment determines the action is <i>not likely to adversely affect</i> Federally-listed species and/or critical habitat, and the Service concurs, the informal consultation process ends. Any consultation documentation between the FAA and the Services, including the FAA's Biological Assessment and Service's concurrence letter, should be included in the FAA's NEPA document.</li> <li>• If the Biological Assessment determines the action is <i>not likely to adversely affect</i> Federally-listed species and/or critical habitat, and the Service <u>does not</u> concur, formal consultation is required. Proceed to Step 1 in Exhibit 2-6 below.</li> <li>• If the Biological Assessment determines the action <u>is likely to adversely affect</u> Federally-listed species and/or critical habitat, the FAA must initiate formal consultation. Proceed to Step 1 in Exhibit 2-6 below.</li> </ul>

<sup>a</sup> This is a recommended process for informal consultation with the Services; however, the consultation process may vary from the steps listed. See the Section 7 Endangered Species Consultation Handbook for more information at: <http://www.fws.gov/endangered/esa-library/index.html#consultations>.

<sup>b</sup> Although a timeframe for responding to these requests is not mandated by regulation, the Services will respond within 30 calendar days when possible.



Exhibit 2-5. ESA Informal Consultation Flow Chart



**Formal Consultation.** As described in Exhibit 2-4 above, formal consultation with the Services becomes necessary when either of the following conditions apply:

- The FAA requests consultation after determining the action is *likely to adversely affect* a listed species or critical habitat; or
- The Services, through informal consultation, conclude that the action is *likely to adversely affect* listed species or critical habitat.

Exhibit 2-6 and Exhibit 2-7 below illustrate the formal consultation process.

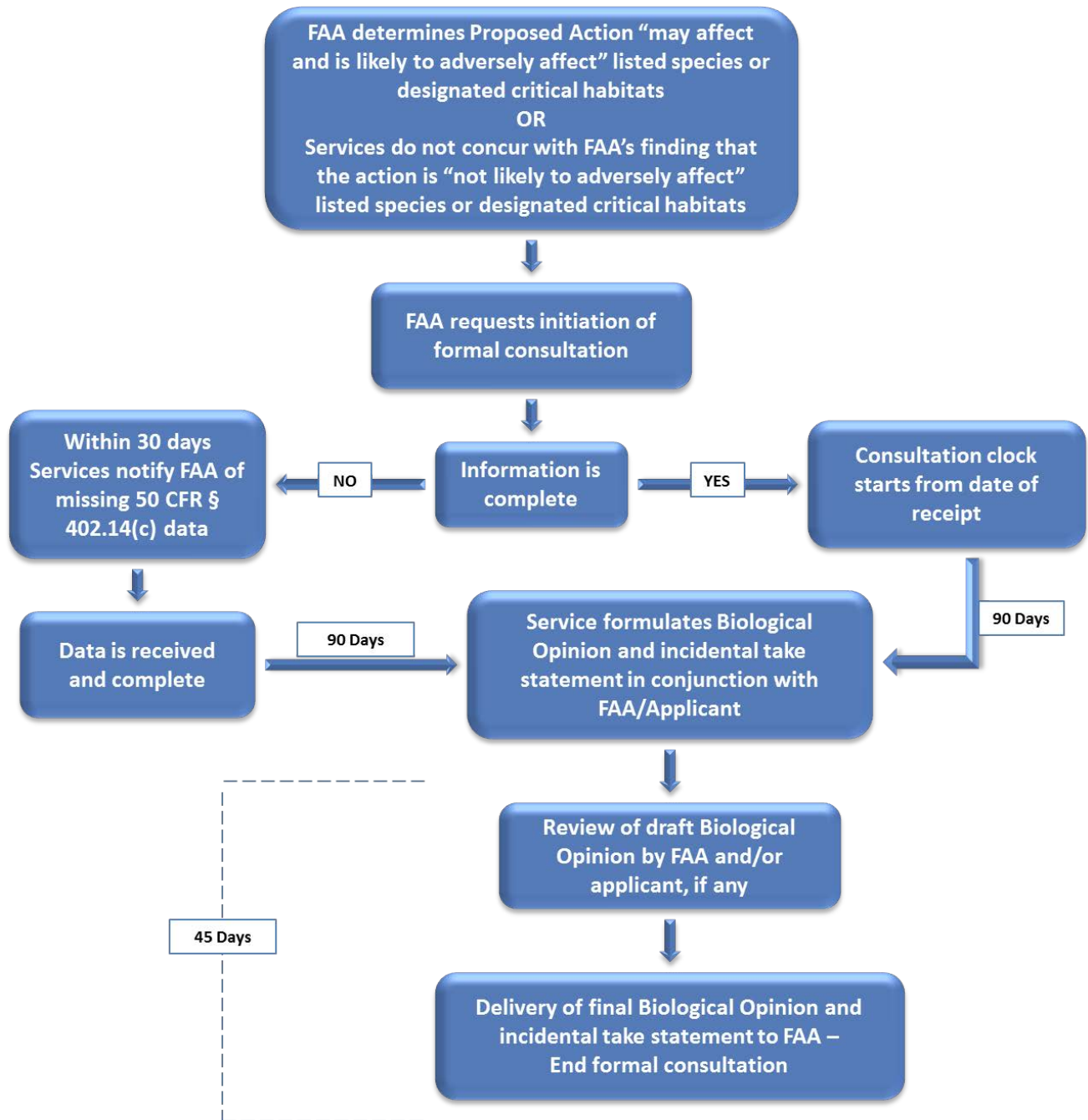
**Exhibit 2-6. Formal Consultation under the ESA<sup>a</sup>**

Step	Action
1	<p>If the FAA determines that the action is <i>likely to adversely affect</i> a listed species or destroy or adversely modify critical habitat, formal consultation is required. In this situation, the FAA must request initiation of formal consultation from the Services. Proceed to Step 2.</p> <p>OR</p> <p>If the Services, through informal consultation, do not concur with the FAA's finding that the action is <i>not likely to adversely affect</i> listed species or critical habitat, formal consultation is required. Proceed to Step 2.</p>
2	<p>The FAA provides all necessary information required by 50 CFR § 402.14(c) to the Services.</p> <ul style="list-style-type: none"> <li>• If the Services determine that the information is <u>complete</u>, the formal consultation clock starts from the date of receipt. The Services then have <b>90 calendar days</b> to develop a draft Biological Opinion and incidental take statement<sup>b</sup> in conjunction with the FAA and send the draft Biological Opinion to the FAA. Proceed to Step 3.</li> <li>• If the Services determine that the information is <u>incomplete</u>, the Services have <b>30 calendar days</b> to notify the FAA of the missing data. Once the missing data is received, the Services have <b>90 calendar days</b> to develop a draft Biological Opinion and incidental take statement<sup>b</sup> in conjunction with the FAA and send the draft Biological Opinion to the FAA. Proceed to Step 3.</li> </ul>
3	<p>The FAA has <b>35 calendar days</b> to review the draft Biological Opinion and incidental take statement and provide comments to the Service (if any). Proceed to Step 4.</p>
4	<p>The Services issue the final Biological Opinion to the FAA (within 135 days from initiation), ending the formal consultation process.</p> <ul style="list-style-type: none"> <li>• If the Services determine <i>No Jeopardy/Adverse Modification</i>, the FAA obtains any required incidental take permits, abides by the terms and conditions set forth in the Biological Opinion, and implements any identified mitigation measures. Any consultation documentation between the FAA and the Services, including the Service's Biological Opinion and incidental take statement, should be included in the FAA's NEPA document.</li> <li>• If the Services determine <i>Jeopardy/Adverse Modification</i>, the FAA has the following options: <ol style="list-style-type: none"> <li>1. Implement one of the reasonable and prudent alternatives provided by the Services;</li> <li>2. Modify the proposed project and consult again;</li> <li>3. Decide not to undertake a project; or</li> <li>4. Apply for an exemption.</li> </ol> </li> </ul>

<sup>a</sup> This is a recommended process for formal consultation with the Services; however, the consultation process may vary from the steps listed. See the Section 7 Consultation Handbook for more information online at: <http://www.fws.gov/angered/esa-library/index.html#consultations>.

<sup>b</sup> Incidental take statements are not prepared for Federally-listed plant species.

**Exhibit 2-7. ESA Formal Consultation Flow Chart**



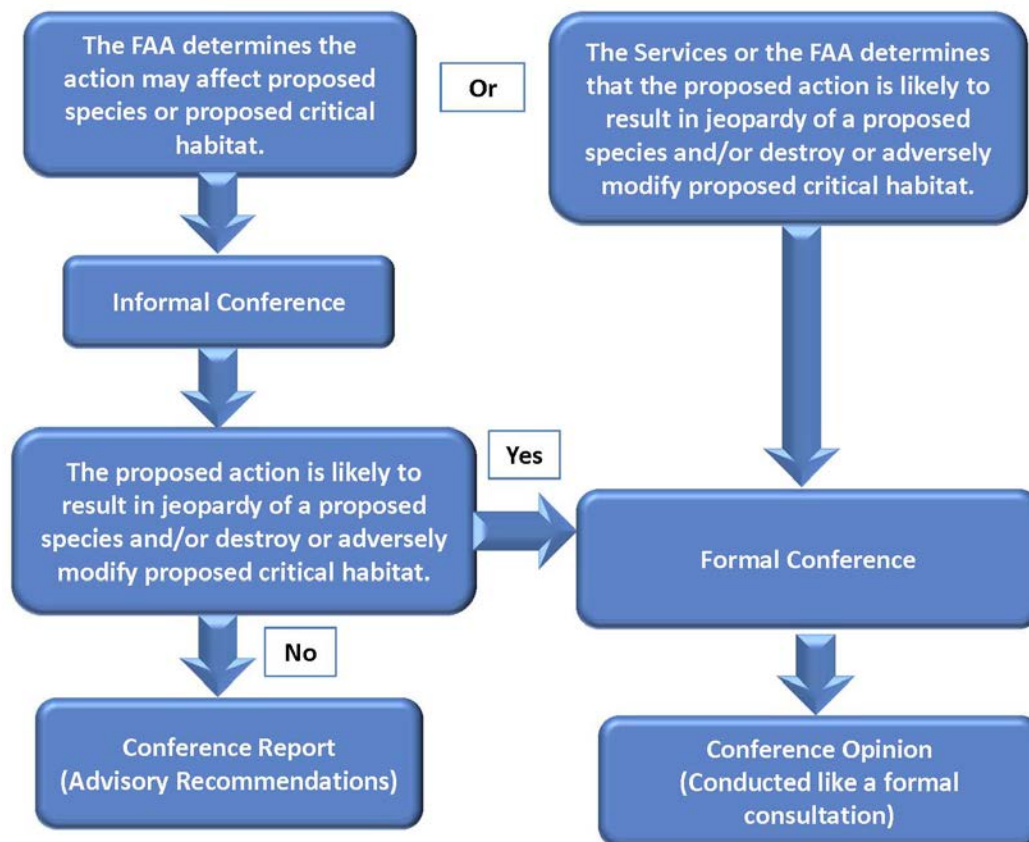
***Conference under Section 7(a)(4)***

A *conference* is a process of early interagency cooperation involving informal or formal discussions between the FAA and the Services pursuant to Section 7(a)(4) of the ESA regarding the likely impact of an action on any species proposed in the *Federal Register* to be listed, or any habitat proposed in the *Federal Register* to be designated as critical habitat, under Section 4 of the ESA. Conferences serve to facilitate the consultation process in the event that a proposed species is listed or proposed critical habitat is designated prior to completion of the FAA's NEPA review process.

Conferences are required for FAA actions likely to jeopardize proposed species, or destroy or adversely modify proposed critical habitat. The FAA can enter into an informal conference if a proposed action may affect a proposed species or proposed critical habitat. The informal conference is similar to informal consultation and involves discussions among the Services. The services may assist in determining effects and ways to avoid or minimize adverse effects to proposed species or proposed critical habitat. The FAA should receive a conference report prepared by the Services which includes advisory recommendations in conclusion to an informal consultation. This is depicted in Exhibit 2-8 below.

If it is determined that a proposed action is likely to result in jeopardy of a proposed species and/or destroy or adversely modify proposed critical habitat, the FAA and the Services can initiate a formal conference. Formal conferences follow the same procedures as formal consultation. In conclusion of the formal conference process, the Services will prepare a Conference Opinion which is similar to the contents and format of a biological opinion. This process is depicted in Exhibit 2-8 below.

If an action will affect both listed and proposed species (or both designated and proposed critical habitat), the conference can be incorporated into the informal or formal consultation processes described above (see Chapter 6 of the USFWS's Consultation Handbook for more information on conferences for proposed species or proposed critical habitat).

**Exhibit 2-8. Informal and Formal Conference Process*****Re-initiation of Consultation***

There are situations in which consultation with the Services, which had previously been concluded, may need to be re-initiated. For example, *candidate species* are those species for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. If consultation has concluded for the listed species that may be affected by the proposed project and a candidate species is listed as threatened or endangered prior to implementation of the action, re-initiation of consultation may be required for the newly listed species. In addition, consultation may be re-initiated by the FAA or the Services when any of the following conditions exist:

- The amount or extent of incidental take is exceeded;
- New information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- The action is modified in a manner causing effects to listed species or critical habitat not previously considered; or
- A new species is listed or critical habitat is designated that may be affected by the action.

For more information regarding Section 7 consultation under the ESA, refer to the Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference

Activities Under Section 7 of the ESA March 1998 available at: <http://www.fws.gov/endangered/esa-library/index.html#consultations>. See also the USFWS Endangered Species Program website at: <http://www.fws.gov/endangered/>.

### ***Coordination of Section 7 Consultation with Other Environmental Reviews***

Environmental reviews, including NEPA, may be processed concurrently with a Section 7 consultation package; however, they should be separate entities. The Section 7 consultation package may be prepared as a stand-alone document under separate signature, or one cover transmittal may be used as long as the consultation package is identified as a separate entity.

A major concern of the FAA is often the timing of the consultation process in relation to NEPA. For example, the time required to conduct formal Section 7 consultation may be longer than the time required to complete the NEPA process. As a result, if the FAA determines that consultation will be required, the FAA should initiate informal consultation prior to scoping for the NEPA process. Biological Assessments may be completed prior to release of the draft EA or EIS, and formal consultation, if required, should be initiated prior to or at the time of release of the draft EA or EIS. Please note that Section 7 consultation must be completed at the time that the final EA or EIS is issued. In addition, the Finding of No Significant Impact (FONSI) or ROD must address the results of Section 7 consultation.

#### **2.1.1.2. Marine Mammal Protection Act**

As described in Exhibit 2-1 above, the MMPA prohibits, with certain exceptions, the “take” of marine mammals in U.S. waters and by U.S. citizens on the high seas (see text box). As a result, if the proposed action or alternative(s) has the potential to impact marine mammals, coordination with the Services (USFWS for sea and marine otters, walruses, polar bears, three species of manatee, and the dugongs; NMFS for all other marine mammals species) may be required before the action can proceed. There are two types of take authorizations which may need to be obtained by the FAA: (1) an Incidental Harassment Authorization (IHA); and (2) an Incidental Take Authorization or Letter of Authorization (LOA).

Under the MMPA, *take* is defined as “to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect or kill” (see 50 CFR § 216.3).

If the FAA determines that the action has the potential to harass a marine mammal, but can demonstrate that the action does not have the potential to result in serious injury or mortality of marine mammals (or that the potential for serious injury or mortality can be negated through mitigation) the FAA should obtain an IHA from the Services. The process for obtaining an IHA typically takes approximately 120 days.

However, if the FAA action has the potential to lead to the incidental take of marine mammals, an LOA must be obtained from the Services. An LOA authorizes a small amount of take, provided the Services conclude that the take would have no more than a “negligible impact” on those marine mammal species not listed as depleted under the MMPA and would not have an “unmitigable adverse impact” on subsistence harvests of those species. An LOA must be

promulgated as a regulation and published in the *Federal Register* and must specify the following:

- Permissible methods and the specified geographic region of the take;
- The means of effecting the least practicable adverse impact on the species or stock and its habitat and on the availability of the species or stock for “subsistence” uses; and
- Requirements for monitoring and reporting, including requirements for the independent peer-review of proposed monitoring plans where the proposed activity may affect the availability of a species or stock for taking for subsistence uses.

As an LOA must be promulgated as a regulation, the process for obtaining an LOA can take between 8–18 months.

### ***Applying for an IHA or LOA***

After the FAA has determined which type of authorization to pursue, the FAA must submit a written request to the Services (the Division of Management Authority of the International Affairs Office for the USFWS and OPR and the appropriate Regional Office where the specified activity is planned for NMFS). All applications for marine mammal incidental take authorizations, whether an IHA or LOA, must include the items identified below before being reviewed by the Services:

- A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals;
- The date(s) and duration of such activity and the specific geographic region where it will occur;
- The species and numbers of marine mammals likely to be found within the activity area;
- A description of the status, distribution, and seasonal distribution (when applicable) of the affected species or stocks of marine mammals likely to be affected by such activities;
- The type of incidental taking authorization that is being requested (i.e., takes by harassment only; takes by harassment, injury and/or death) and the method of incidental taking;
- By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in #5 above, and the number of times such takings by each type of taking are likely to occur;
- The anticipated impact of the activity upon the species or stock;
- The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses;
- The anticipated impact of the activity upon the habitat of the marine mammal populations, and the likelihood of restoration of the affected habitat;
- The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved;
- The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and on their availability for

subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance;

- Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, the applicant must submit either a “plan of cooperation” or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses;
- The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities, and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding. Guidelines for developing a site-specific monitoring plan may be obtained by writing to the Director, OPR; and
- Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects.

For additional information, see the USFWS website at: <http://www.fws.gov/international/laws-treaties-agreements/us-conservation-laws/marine-mammal-protection-act.html> and the NMFS website at: <http://www.nmfs.noaa.gov/pr/laws/mmpa/> and <http://www.nmfs.noaa.gov/pr/species/mammals/>.

### ***ESA and MMPA***

Any takings of marine mammals listed as threatened or endangered under the ESA must be authorized under both the ESA and the MMPA. The ESA takes are authorized by an incidental take statement under Section 7. An incidental take statement cannot be authorized for a listed marine mammal until the appropriate MMPA authorization is completed.

#### **2.1.1.3. Magnuson-Stevens Fishery Conservation and Management Act**

Under the Magnuson-Stevens Fishery Conservation and Management Act, the FAA must consult with NMFS with regard to any action authorized, funded, or undertaken that may adversely affect any essential fish habitat identified under the Act. The consultation procedures are similar to ESA consultation requirements. NMFS shall provide conservation recommendations (which may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on essential fish habitat) to the FAA for activities that would adversely affect essential fish habitat. The FAA must provide a detailed response in writing to NMFS and to any Regional Fishery Management Council commenting under Section 305(b)(3) of the Act within 30 days after receiving an essential fish habitat conservation recommendation (or at least 10 days prior to final approval of the action, if a decision by the Federal agency is required in less than 30 days). The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on essential fish habitat. In the case of a response that is inconsistent with the recommendations of NMFS, the FAA must explain its reasons for not following the recommendations, including the scientific justification for any



disagreements with NMFS over the anticipated effects of the action and the measures needed to avoid, minimize, mitigate, or offset such effects.

NMFS has defined several approaches to meet the essential fish habitat consultation requirements, including:

- Use of existing procedures – The use of existing environmental coordination and/or review procedures (e.g. the NEPA process) to meet essential fish habitat consultation requirements is the preferred approach for essential fish habitat consultations;
- General concurrences – Identifies specific types of Federal actions that may adversely affect essential fish habitat, but for which no further consultation will generally be required;
- Programmatic consultations – Allows NMFS and the FAA to consult on, and NMFS to provide essential fish habitat conservation recommendations for, a potentially large number of individual actions that may adversely affect essential fish habitat. The FAA may request programmatic consultation with NMFS; or
- Abbreviated and expanded consultation – When no other methods can be used for essential fish habitat consultation, the FAA must use the abbreviated or expanded consultation processes outlined in the essential fish habitat regulations at 50 CFR § 600.920(h) and § 600.920(i).

More information on these approaches can be accessed online at: [http://www.habitat.noaa.gov/pdf/efhconsultationguidancev1\\_1.pdf](http://www.habitat.noaa.gov/pdf/efhconsultationguidancev1_1.pdf).

## 2.2. Affected Environment

When defining the study area for biological resources, consider both areas directly impacted (such as through vegetation and habitat removal within the construction footprint) and those areas indirectly impacted through facility lighting, noise, air emissions, and changes to water quality or quantity caused by construction equipment or facility operations.

The presence of biological resources is best determined by visiting a project site to conduct a field assessment; field assessments should be conducted by a qualified specialist who can evaluate the proposed site's biological characteristics. If a field assessment is not possible, the following resources can also help to identify the presence of biological resources in the study area:

- Recent plant and wildlife surveys conducted for a project site or surrounding locations;
- Recent published literature for a project site or surrounding locations;
- Recent NEPA documents for a project site or surrounding locations; and
- Other publicly available information, such as Geographic Information System (GIS) data, and maps.

Using all available information, provide a general description of the plant and animal species potentially present within or near the proposed study area. For animal species, it might be appropriate to organize the discussion by the major animal groups (i.e., mammals, birds, reptiles, amphibians, fish, and invertebrates) and then list example species. For plant species, it might be appropriate to provide an overview of the type(s) of vegetative communities in and surrounding the study area (including invasive species).

Special emphasis should be placed on any Federally or state-listed threatened or endangered species, or species proposed for listing, that may be present in the study area. For these species, provide a table listing all species and their designation (e.g., Federally-threatened or state species of concern). In addition, provide a general description of each species, including known or historic locations of each species, habitat requirements, cause(s) of species decline, etc. If Federally-designated critical habitat is present within or near the study area, describe the critical habitat and provide a map that shows the location of the critical habitat in relation to the study area.

In addition, the following is a list of electronic sources which might be useful in gathering information regarding the biological resources that may be present in the study area:

### **2.2.1. Federally-Protected Species; Critical Habitat; Essential Fish Habitat**

- USFWS IPaC website at: <http://ecos.fws.gov/ipac/> for Federally-listed threatened and endangered species lists and designated critical habitat by county;
- USFWS Ecological Services field office websites for Federally-listed species county lists;
- USFWS Environmental Conservation Online System website at: <http://ecos.fws.gov/ecos/indexPublic.do> for information and *Federal Register* documents on Federally-listed species under the jurisdiction of the USFWS;
- USFWS Critical Habitat Portal at: <http://criticalhabitat.fws.gov/crithab/> for locations of designated critical habitat for species under the jurisdiction of the USFWS;
- NMFS' OPR's website at: : <http://www.nmfs.noaa.gov/pr/> for information on Federally-listed threatened and endangered species, critical habitat areas, and MMPA-protected species under the jurisdiction of NMFS;
- USFWS Marine Mammals Habitat and Resource Conservation website at: <http://www.fws.gov/international/animals/marine-mammals.html> for information on MMPA-protected species under the jurisdiction of the USFWS;
- NMFS Essential Fish Habitat Mapper at: <http://www.habitat.noaa.gov/protection/efh/habitatmapper.html> for locations of essential fish habitat; and
- Multi-Federal agency-supported Marine Cadastre website at: <http://www.marinecadastre.gov/> for geospatial marine data that show important coastal features, special habitat areas, and jurisdictional boundaries.

### **2.2.2. State-Protected Species**

- State Wildlife Action Plans at: <http://teaming.com/state-wildlife-action-plans-swaps>; and
- State Fish and Wildlife websites.

### **2.2.3. Migratory Birds**

- USFWS Migratory Bird Program website at: <http://www.fws.gov/migratorybirds/> for information on migratory birds protected by the Migratory Bird Treaty Act

## **2.3. Environmental Consequences**

When discussing potential impacts to biological resources, start by explaining the methodology used to evaluate impacts, if applicable. The NEPA document should contain an explanation of any assumptions used in the analysis. In consultation with agencies and organizations having jurisdiction or special expertise concerning the protection and/or management of affected species, consider factors affecting population dynamics and sustainability, such as reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), and the minimum population levels required for population maintenance. Relevant information may be obtained from state, tribal, and local wildlife management agencies and scientific literature concerning wildlife management (e.g., U.S. Department of Agriculture National Wildlife Research Center library).

When analyzing impacts for biological resources, established scientific practices should be used to obtain the best estimate of potential effects. Studies on specific species should be used where possible; however, impact studies of similar species, where similarity may be judged on physiological, phylogenetic, or ecological criteria can be used to obtain the best estimate of potential impacts. This estimate should be qualified by a discussion of the biological uncertainties that arise from gaps in theory and distinctions between the studied species and the affected species.

### **2.3.1. Construction Impacts**

Potential impacts on biological resources from construction activities include the destruction or alteration of habitat and the disturbance or elimination of individuals or local populations of fish, wildlife, plants, or the introduction of invasive species. One way to assess the potential impacts on vegetation and wildlife is to calculate the area that could be affected during construction for each alternative and identify the vegetation types and wildlife species associated with that area. Use of GIS data may be helpful when estimating the size of the area that could be affected. In addition, conducting a noise analysis allows for a quantitative assessment of potential noise levels generated by construction and thus an assessment of the potential impact on noise-sensitive wildlife species from construction-related noise.

### **2.3.2. Operation Impacts**

Like construction, potential impacts on biological resources from operations include disturbance to noise-sensitive terrestrial and aquatic animal species generated by operational noise. A noise analysis allows for a quantitative assessment of the potential impact on these noise-sensitive species. When discussing the extent of the potential impact, include areas within the vicinity of operations as well as any land area or open water (such as oceans) that aircraft or commercial space launch vehicles would fly over. Additional potential direct impacts on biological resources from operations include those that would occur during an accidental spill of fluids or a launch

anomaly, assuming the accident resulted in disturbance or death of individual fish, wildlife, or plants.

### 2.3.3. Significance Determination

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for biological resources (including fish, wildlife, and plants). A significant impact to biological resources would occur when: *The U.S. Fish and Wildlife Service or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a Federally-listed threatened or endangered species, or would result in the destruction or adverse modification of federally-designated critical habitat.* The FAA has not established a significance threshold for non-listed species.

In addition to the threshold above, Exhibit 4-1 of FAA Order 1050.1F provides additional factors to consider in evaluating the context and intensity of potential environmental impacts for biological resources. Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to biological resources include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential for:

- A long-term or permanent loss of unlisted plant or wildlife species, i.e., extirpation of the species from a large project area (e.g., a new commercial service airport);
- Adverse impacts to special status species (e.g., state species of concern, species proposed for listing, migratory birds, bald and golden eagles) or their habitats;
- Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or
- Adverse impacts on a species' reproductive success rates, natural mortality rates, non-natural mortality (e.g., road kills and hunting), or ability to sustain the minimum population levels required for population maintenance.

## 2.4. Mitigation

Examples of potential measures to mitigate impacts to biological resources include:

- phasing activities to avoid breeding, nesting, flowering, or pollination seasons;
- conducting surveys for nesting migratory birds during the breeding season prior to construction, resulting in avoidance and/or relocation of active nests to the extent possible;
- conducting surveys for state or Federally-listed plants prior to planned construction;
- fencing best management practices, to the extent possible, that allow for wildlife movement at all locations when appropriate;
- re-vegetation of temporarily disturbed work areas, using original top soil as a seed bank;

- enhancement of off-site habitats (not near airports) to replace those habitats made un-usable or inaccessible; and
- monitoring of wildlife populations within and/or near the study area to examine for potential shifts in density and diversity.

Common construction-related mitigation measures include:

- adherence to state guidelines to reduce threats to local fauna; and
- adherence to state distribution line guidelines for on- and off-site construction of aboveground lines to reduce threats to birds, particularly raptors.

## 2.5. Sample Consultation Letter

Exhibit 2-9 presents a sample letter to the Services documenting a *may affect, not likely to adversely affect* determination by the FAA for non-major construction activities.

### **Exhibit 2-9. Sample Letter Documenting the FAA’s Determination of *May Affect, Not Likely to Adversely Affect* and Requesting Service Concurrence For a Non-Major Construction Activity**

U.S. Department of Transportation  
Federal Aviation Administration

(Name)

Fish and Wildlife Biologist

U.S. Fish and Wildlife Service

(Address)

RE: Section 7 Consultation for Activities Associated with an FAA Launch Site Operator License at Cape Canaveral Air Force Station

Dear *(Name)*,

Thank you for your email to *(FAA employee name)* of my staff on August 13, 2010, regarding the Federal Aviation Administration’s (FAA) July 2010 final Environmental Assessment (EA) for Space Florida Launch Site Operator License. As you are aware, the EA evaluates the potential environmental impacts of the proposed action, where the FAA would issue a Launch Site Operator License to Space Florida to operate a commercial space launch site at Launch Complex (LC)-36 at Cape Canaveral Air Force Station (CCAFS) in Brevard County, Florida. Per your conversation with *(FAA employee name)* on *(date)* regarding the FAA’s Section 7 consultation obligations under the Endangered Species Act, we are requesting your concurrence with our assessment and determination of potential effects of the proposed action on 12 Federally-listed threatened and endangered species and their critical habitats.

Project Description

(Describe project, including figures as needed)

Federally-Threatened and Endangered Species

The threatened and endangered species listed by the United States Fish and Wildlife Service in Brevard County, Florida are depicted in Exhibit 1.

**Exhibit 2-9. Sample Letter Documenting the FAA’s Determination of *May Affect, Not Likely to Adversely Affect* and Requesting Service Concurrence For a Non-Major Construction Activity**

(List species in a table)

Potential Federally-Listed Species Presence Around LC-36

Habitat around LC-36 is suitable to support all Federally-listed species in Brevard County except Audubon's crested caracara, Red-cockaded woodpecker, and Carter's mustard. Prairie habitat and open mature pine woodlands are not found around LC-36. In addition, no known Federally-listed plant species are known to occur in CCAFS. These three species will not be discussed further.

Action Area

*(Describe action area)* The project action area is defined as all areas to be affected directly or indirectly by the proposed action and not merely the area immediately adjacent to the action. Therefore, the project action area includes the area inside the LC-36 perimeter for construction activities, and the areas where launch blast emissions may be felt and noise may be heard.

Effects Determinations

Birds

The FAA has determined that the proposed project warrants a **May Affect, Not Likely to Adversely Affect** for the Florida scrub-jay, Piping plover, and Wood stork.

A determination of **May Affect** is warranted for the project based on the following rationale:

(List reasons – can be in bulleted format)

- The presence of potential habitat around LC-36.
- Disturbances from construction noise and human activities could startle and disturb these birds, if present.
- Disturbances from launch operations, such as noise/vibration and rocket exhaust, could startle and disturb these birds, if present.
- The potential for a direct bird strike during vehicle launch.

A determination of **Not Likely to Adversely Affect** is based on the following rationale:

(List reasons – can be in bulleted format)

- All construction would occur inside the perimeter of LC-36 and no direct impacts to native habitats are expected. Construction noise would be short term and temporary.
- Rocket exhaust clouds near the launch site could result in displacement and disorientation of the birds, but the exhaust would be of very short duration and would be rapidly dispersed due to the mechanical and thermal turbulence of the exhaust gases, the movement of the vehicle, and wind action.
- Noise from rocket launches would be short term and temporary (less than one minute).
- The probability of a bird strike during a launch event is extremely low.

Mammals

The FAA has determined that the proposed project warrants a **May Affect, Not Likely to Adversely Affect** for the West Indian manatee’s designated critical habitat.

A determination of **May Affect** is warranted for the project based on the following rationale:

(List reasons – can be in bulleted format)

**Exhibit 2-9. Sample Letter Documenting the FAA's Determination of *May Affect, Not Likely to Adversely Affect* and Requesting Service Concurrence For a Non-Major Construction Activity**

- The presence of the nearby Banana River, which is designated critical habitat for the West Indian manatee.
- Disturbances from launch activities, such as rocket exhaust.
- Disturbances from launch anomalies or failures, such as leaching of rocket propellant into the river or vehicle parts landing in the river.

A determination of **Not Likely to Adversely Affect** is based on the following rationale:

(List reasons – can be in bulleted format)

- Rocket exhaust near the launch site could result in acid deposition that could reach the Banana River, but the exhaust would be of very short duration and would be rapidly dispersed due to the mechanical and thermal turbulence of the exhaust gases, the movement of the vehicle, and wind action.
- The probability of launch anomalies resulting in the accidental release of rocket propellant or vehicle parts in the early stage of flight is extremely small. In the unlikely event of such an anomaly, perchlorate from solid propellant rockets could leach into the Banana River, resulting in short-term impacts. However, perchlorate leaches slowly (in freshwater at 20°C it would take over a year for the perchlorate contained in solid propellant to leach out into the water, and even longer in lower water temperatures and more saline waters). As a result, perchlorate would be diluted in the water over this time period and would not reach toxic concentrations.
- Emergency response and clean-up procedures would reduce the magnitude and duration of any impacts to the Banana River from accidental propellant or vehicle part releases.

(Continue the same procedure as above for all remaining species and critical habitat)

We seek your concurrence on our determinations. Thank you for your assistance in this matter. Please provide your response to *(FAA employee name)*, FAA Environmental Specialist, by mail at *(address)*, by e-mail at *(address)*, or by phone at *(number)*.

Sincerely,

(Name and Title)

### 3. Climate

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The Intergovernmental Panel on Climate Change (IPCC) estimates that aviation accounted for 4.1% percent of global transportation GHG emissions. In the United States, U.S. Environmental Protection Agency (EPA) data indicate that commercial aviation contributed 6.6% percent of total CO<sub>2</sub> emissions in 2013, compared with other sources, including the remainder of the transportation sector (20.7 percent), industry (28.8 percent), commercial (16.9 percent), residential (16.9 percent), agricultural (9.7 percent) and U.S. territories (.05 percent).<sup>1</sup>

Scientific research is ongoing to better understand climate change, including any incremental atmospheric impacts that may be caused by aviation. Uncertainties are too large to accurately predict the timing, magnitude, and location of aviation’s climate impacts; however, it is clear that minimizing GHG emissions and identifying potential future impacts of climate change are important for a sustainable national airspace system.

Increasing concentrations of GHGs in the atmosphere affect global climate.<sup>2</sup> GHG emissions result from anthropogenic sources including the combustion of fossil fuels. GHGs are defined as including carbon CO<sub>2</sub>, methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).<sup>3</sup> CO<sub>2</sub> is the most important anthropogenic GHG because it is a long-lived gas that remains in the atmosphere for up to 100 years.

<sup>1</sup> GHG allocation by economic sector. Environmental Protection Agency (2015). *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013*. Available at: <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html#fullreport>

<sup>2</sup> IPCC (2014). *Fifth Assessment Report*. Available at: <https://www.ipcc.ch/report/ar5/syr/> United States Global Change Research Program (2009). *Global Climate Change Impacts in the United States*. Available at: <http://www.globalchange.gov/what-we-do/assessment/previous-assessments/global-climate-change-impacts-in-the-us-2009>.

<sup>3</sup> Executive Order 13693, *Planning for Federal Sustainability in the Next Decade*. Available at: <https://www.whitehouse.gov/the-press-office/2015/03/19/executive-order-planning-federal-sustainability-next-decade>



Climate change is a global phenomenon that can have local impacts.<sup>4</sup> Scientific measurements show that Earth's climate is warming, with concurrent impacts including warmer air temperatures, increased sea level rise, increased storm activity, and an increased intensity in precipitation events. Research has shown there is a direct correlation between fuel combustion and GHG emissions.

### 3.1. Regulatory Setting

Exhibit 3-1 lists the primary statutes, regulations, and Executive Orders related to climate.

**Exhibit 3-1. Statutes, Regulations, and Executive Orders Related to Climate**

Statute, Regulation, or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation or Support Document	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Clean Air Act	42 U.S.C. §§ 7408, 7521, 7571, 7661 et seq.	40 CFR parts 85, 86, and 600 for surface vehicles  40 CFR part 60 for stationary power generation sources	EPA	Regulates GHG emissions from on-road surface transportation vehicles and stationary power generation sources.
Executive Order 13514 Federal Leadership in Environmental Energy and Economic Performance	74 <i>Federal Register</i> 52117 (October 8, 2009)	<i>Federal Greenhouse Gas Accounting and Reporting Guidance: Technical Support Document</i>  (October 26, 2010)	None	Makes it the policy of the United States that Federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities. Provides for development of the Technical Support Document that establishes reporting criteria for GHGs.
Executive Order 13653, <i>Preparing the United States for the Impacts of Climate Change</i>	78 <i>Federal Register</i> 66817, (November 6, 2013)	None	None	Builds on a previously released (and since revoked) <i>EO 13514 Federal Leadership in Environmental Energy, and Economics Performance</i> to establish direction for federal agencies on how to improve on climate preparedness and reliance strategies.

<sup>4</sup> As explained by the EPA, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." EPA, (2009) Climate Change Division, Office of Atmospheric Programs, *Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3*. Available at: [http://www.epa.gov/climatechange/Downloads/endangerment/TSD\\_Endangerment.pdf](http://www.epa.gov/climatechange/Downloads/endangerment/TSD_Endangerment.pdf).

Statute, Regulation, or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation or Support Document	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Executive Order 13693, <i>Planning for Federal Sustainability</i>	80 <i>Federal Register</i> 15869	Forthcoming	None	Reaffirms the policy of the United States that Federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities. Sets sustainability goals for all agencies to promote energy conservation, efficiency, and management while by reducing energy consumption and GHG emissions. Builds on the adaptation and resiliency goals in EO 13693 to ensure agency operations and facilities prepare for impacts of climate change. Revokes EO 13514.

<sup>a</sup> U.S.C. = United States Code; Code of Federal Regulations (CFR)

In response to Executive Order 13514, Council on Environmental Quality (CEQ) developed *Federal Greenhouse Gas Accounting and Reporting Guidance* (October 6, 2010) (hereafter “Federal protocol”), which serves as the Federal government’s official GHG reporting protocol. GHGs result primarily from combustion of fuels, and there is a direct relationship between fuel combustion and metric tonnes of CO<sub>2</sub> (MT CO<sub>2</sub>). In accordance with the Federal protocol, and to provide a single metric that embodies all GHGs, emissions should be discussed and reported in metric tonnes of CO<sub>2</sub> equivalent (MT CO<sub>2</sub>e). In December 2014, CEQ issued revised draft NEPA guidance for considering the effects of climate change and GHG emissions.<sup>5</sup> The draft CEQ guidance recommended consideration of: (1) the potential effects of a proposed action or its alternatives on climate change as indicated by its GHG emissions; (2) the implications of climate change for the environmental effects of a proposed action or alternatives. This chapter provides guidance on both of these considerations for FAA actions. There may also be state or local requirements applicable to particular proposed projects. Other Federal agencies with permitting or approval responsibility may also have guidance that should be considered. Early coordination with other agencies is recommended in order to identify any documentation needs.

### 3.1.1. Overview of the NEPA Review Process

Discussion of potential climate impacts should be documented in a separate section of the NEPA document, distinct from air quality, under a heading labeled Climate.

<sup>5</sup> CEQ (2014). Revised Draft Guidance, *Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews*, 79 *Federal Register* 77801 (December 24, 2014). Available at: <https://www.federalregister.gov/articles/2014/12/24/2014-30035/revised-draft-guidance-for-federal-departments-and-agencies-on-consideration-of-greenhouse-gas>

- If GHGs and climate are not relevant to the proposed action and alternative(s) (i.e., because there would be no GHG emissions), this should be briefly noted and no further analysis is required.
- Where the proposed action or alternative(s) would not result in a net increase in GHG emissions (as indicated by quantitative data or proxy measures such as reduction in fuel burn, delay, or flight operations), a brief statement describing the factual basis for this conclusion is sufficient.
- Where the proposed action or alternative(s) would result in an increase in GHG emissions, the emissions should be assessed either qualitatively or quantitatively as described below. There are no significance thresholds for aviation or commercial space launch GHG emissions, and it is not currently useful for the NEPA analysis to attempt to link specific climate impacts to the proposed action or alternative(s) given the small percentage of emissions aviation and commercial space launch projects contribute.

## 3.2. Affected Environment

For FAA project-level actions, the affected environment section for climate is highly dependent on the project itself and is defined as the entire geographic area that could be either directly or indirectly affected by the proposed project.

For an air traffic action, the study area is typically larger than the immediate vicinity of an airport, can incorporate more than one airport, and may extend vertically up to the extent of the project changes.

For airport actions, the study area is defined by the extent of the project changes (i.e., immediate vicinity of the airport) and should reflect the full extent of aircraft movements as part of the project changes. Please see FAA's Air Quality Handbook for more information for defining the study area.

As explained in Section 3.3.1 below, analysis of GHG emissions should be quantitatively assessed in certain circumstances, but otherwise may be qualitatively assessed. Where the analysis is quantitative, the affected environment section for climate should provide the quantitative data for the no action alternative, which provides the baseline of existing GHG emissions in the study area. Where the analysis is qualitative, the affected environment section should be tailored to the qualitative analysis.

The affected environment section should also discuss the current level of preparedness in the study area with respect to the impacts of climate change. This involves describing current measures that are in place within the study area to adapt to the impacts of climate change (e.g., sea level rise, stronger or more frequent storms, etc.). This discussion should be concise and may be quantitative or qualitative, depending on the nature of a project area.

## 3.3. Environmental Consequences

### 3.3.1. NEPA Evaluation Process

The draft CEQ guidance affirmed the applicability of NEPA and the CEQ Regulations to GHGs and climate. As noted by CEQ, "climate change is a particularly complex challenge given its global nature and inherent interrelationships among its sources, causation, mechanisms of action,

and impacts; however, analyzing the proposed action's climate impacts and the effects of climate change relevant to the proposed action's environmental outcomes can provide useful information to decisionmakers and the public and should be very similar to considering the impacts of other environmental stressors under NEPA."<sup>6</sup> CEQ specifically asks agencies to consider<sup>7</sup>;

- 1) The potential effects of a proposed action on climate change as indicated by its GHG emissions; and
- 2) The implications of climate change for the environmental effects of a proposed

Considering GHG emissions for an FAA NEPA review should follow the basic procedure of considering the potential incremental change in CO<sub>2</sub> emissions that would result from the proposed action and alternative(s) compared to the no action alternative for the same timeframe, and discussing the context for interpreting and understanding the potential changes. For FAA NEPA reviews, this consideration could be qualitative (e.g., explanatory text), but may also include quantitative data (e.g., calculations of estimated project emissions). Proxy measurements such as delay time or fuel burn can be used in qualitative considerations, for example, to explain that the proposed action would cause no change or a decrease in emissions.

CO<sub>2</sub>e emissions should be quantified under the following circumstances:

- When there is reason to quantify emissions for air quality purposes, then MT CO<sub>2</sub>e should also be quantified and reported in the NEPA document; or
- When fuel burn is computed and reported in the NEPA document, quantification of MT CO<sub>2</sub>e calculated from the fuel burned should also be included in the document.<sup>8</sup>

Below are descriptions of two potential circumstances that may be encountered, with explanations of how the NEPA evaluation process should be conducted for each:

1. *Proposed action and alternative(s) would not increase GHG emissions compared to the no action alternative.* If the proposed action and alternative(s) would cause no net change or a net reduction in GHG emissions, based on a quantitative or qualitative assessment, this should be briefly explained in the Environmental Assessment (EA) or Environmental Impact Statement (EIS) and no further consideration of GHGs is necessary.
2. *Proposed action or alternative(s) would result in an increase of GHG emissions over the no action alternative.* GHG emissions that would be caused by a project should be discussed in their context. The process for considering the context of MT CO<sub>2</sub>e is described below. If GHG emissions are not quantified because other air emissions are not quantified and/or fuel burn is unable to be computed, context should be considered qualitatively. When reporting quantified calculations, the following guidelines on data analysis should be followed. When in doubt, the appropriate FAA Headquarters program office or FAA Office of Environment and Energy (AEE) should be consulted regarding how best to scope the analysis and discussion of GHG emissions.

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<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> The draft CEQ Guidance has recommended a 25,000 metric ton threshold for disclosure purposes. FAA has not adopted this disclosure threshold. FAA discloses CO<sub>2</sub> emissions in the NEPA documentation whenever calculations are provided through modeling, regardless of whether it is above or below the 25,000 tons.

### 3.3.2. Data Analysis

Of the six recognized GHGs, only CO<sub>2</sub> is a direct aircraft combustion product. For FAA NEPA evaluations, the amount of CO<sub>2</sub> and/or fuel burn from aircraft operations should be calculated from an FAA-approved tool appropriate for the action. The Aviation Environmental Design Tool (AEDT) can generate CO<sub>2</sub> emissions for aircraft operations, as well as ground service equipment, motor vehicles, and other sources of emissions. If aircraft CO<sub>2</sub> is not calculated directly by the tools used, the CO<sub>2</sub> emissions should be calculated from projections of total fuel burned.

To convert consumed fuel quantities to CO<sub>2</sub> emissions, the following conversion factors should be used:

- 1 gallon of jet fuel consumed = 9.7438 kg of CO<sub>2</sub> = 0.0097438 MT CO<sub>2</sub>
- 1 pound of jet fuel consumed = 1.4329 kg of CO<sub>2</sub> = 0.0014329 MT CO<sub>2</sub>
- 1 gallon of avgas consumed = 8.3182 kg of CO<sub>2</sub> = 0.0083182 MT CO<sub>2</sub>
- 1 pound of avgas consumed = 1.3864 kg of CO<sub>2</sub> = 0.0013864 MT CO<sub>2</sub>

The calculation of aircraft CO<sub>2</sub> for an action alternative would be added to any other potential GHGs for that alternative in order to reach an overall CO<sub>2</sub>e total for that alternative. If the proposed action involves only aircraft operational changes, then the MT CO<sub>2</sub>e would be exactly the same as the aircraft MT CO<sub>2</sub>. If further details are necessary to convert fuel burn to CO<sub>2</sub>e for non-aircraft sources (e.g., stationary sources, construction equipment, etc.), then the Federal protocol should be consulted. The total MT CO<sub>2</sub>e should be calculated for what is reasonably foreseeable, using the same analytical timeframes currently used for NEPA analyses.

The study area for climate should be congruent with the the scope of the air quality analysis. Note that non-aircraft emission sources are typically not affected by airspace and procedural actions. For an airport action, the GHG evaluation should include the same emission sources that would typically be included in the air quality analysis. For non-aircraft sources of emissions, GHG emissions should be determined from projections of fuel burn and converted to CO<sub>2</sub>e.

### 3.3.3. Documentation

When CO<sub>2</sub>e is quantified, the MT CO<sub>2</sub>e results should be provided in a table or similar format that compares the alternatives directly. When fuel burn is computed, the MT CO<sub>2</sub> equal to that fuel content should be documented and discussed in the section of the document on Climate.

### 3.3.4. Significance Determination

There are no significance thresholds for aviation or commercial space launch GHG emissions, nor has the FAA identified specific factors to consider in making a significance determination for GHG emissions. There are currently no accepted methods of determining significance applicable to aviation or commercial space launch projects given the small percentage of emissions they contribute. CEQ has noted that “it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the

particular project or emissions, as such direct linkage is difficult to isolate and to understand.”<sup>9</sup> Accordingly, it is not useful to attempt to determine the significance of such impacts. There is a considerable amount of ongoing scientific research to improve understanding of global climate change and FAA guidance will evolve as the science matures or if new Federal requirements are established.

### **3.4. Reducing Emissions**

Reduction of GHG emissions resulting from FAA actions contributes towards the U.S. goal of reducing aviation’s impacts on climate. For NEPA reviews of proposed FAA actions that would result in increased emissions of GHGs, consideration should be given to whether there are areas within the scope of a project where such emissions could be reduced. GHG emission reduction can come from measures such as changes to more fuel efficient equipment, delay reductions, use of renewable fuels, and operational changes (e.g., performance-based navigation procedures). However, GHG emission reduction is not mandated and will not be possible in all situations.

### **3.5. Climate Adaptation**

The environmental consequences section should include a discussion of the extent to which the proposed action or alternatives(s) could be affected by future climate conditions, based on published sources applicable to the study area. For example, a project area’s ability to sustain impacts caused by climate changes should be described (e.g., identify current robustness and height of seawalls for coastal airports). This discussion should include any considerations to adapt to forecasted climate change conditions.

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<sup>9</sup> CEQ (2010). Draft Guidance, *Consideration of the Effects of Climate Change and Greenhouse Gas Emissions*, 75 *Federal Register* 8046 (February 23, 2010) available at <http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf>

## 4. Coastal Resources

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Coastal resources include all natural resources occurring within coastal waters and their adjacent shorelands. Coastal resources include islands, transitional and intertidal areas, salt marshes, wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as fish and wildlife and their respective habitats within these areas. Coastal resources include the coastlines of the Atlantic and Pacific oceans, the Great Lakes, and the Gulf of Mexico.

### 4.1. Regulatory Setting

Exhibit 4-1 lists the primary statutes, regulations, and Executive Orders that may be relevant to the proposed project. See Appendix B.3 for more detailed information about these requirements.

**Exhibit 4-1. Statutes, Regulations, and Executive Orders Related to the Protection of Coastal Resources**

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Coastal Barrier Resources Act	16 U.S.C. § 3501 et seq.	U.S. Department of the Interior Coastal Barrier Act Advisory Guidelines, 57 <i>Federal Register</i> 52730, (November 5, 1992)	USFWS; FEMA	Prohibits, with some exceptions, Federal financial assistance for development within the Coastal Barrier Resources System that contains undeveloped coastal barriers along the Atlantic and Gulf coasts and Great Lakes.
Coastal Zone Management Act	16 U.S.C. §§ 1451-1466	15 CFR part 930, subparts C and D 15 CFR part 923	NOAA; Appropriate State Agency	Provides for management of the nation's coastal resources, including the Great Lakes.

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
National Marine Sanctuaries Act	16 U.S.C. § 1431 et seq.	15 CFR part 922, subparts F through R	NOAA	Protects areas of the marine environment with special national significance, and requires Federal agencies whose actions could impact sanctuary resources to consult with the program before taking action.
Executive Order 13089, Coral Reef Protection	63 <i>Federal Register</i> 32701, (June 16, 1998)	Not applicable	NOAA	Requires Federal agencies to identify any actions that might affect coral reef ecosystems, protect and enhance the conditions of these ecosystems, and ensure that, to the extent permitted by law, the actions carried out, authorized, or funded by Federal agencies will not negatively impact or degrade coral reef ecosystems.
Executive Order 13547, Stewardship of the Ocean, Our Coasts, and the Great Lakes	75 <i>Federal Register</i> 43021-43027, (July 22, 2010)	Not applicable	Not applicable	Establishes the National Ocean Council, and development of a National Ocean Policy Implementation Plan to promote the well-being, prosperity, and security of ocean, coastal, and Great Lakes ecosystems.

<sup>a</sup> U.S.C. = United States Code; CFR= Code of Federal Regulations; FEMA = Federal Emergency Management Agency; USFWS = U.S. Fish and Wildlife Service; NOAA = National Oceanic and Atmospheric Administration

#### 4.1.1. Consultations, Permits, and Other Approvals

This section provides detailed information about consultation required for the Coastal Zone Management Act (CZMA) and the Coastal Barrier Resources Act (CBRA).

##### 4.1.1.1. Coastal Zone Management Act

As noted in Exhibit 4-1 above, the CZMA provides for the management of U.S. coastal resources. If the proposed action or its alternative(s) has the potential for impacts within a coastal zone, the FAA (or an applicant, as appropriate) must initiate consultation with the relevant state agency to ensure that the proposed action and alternative(s) are consistent with the state's coastal management program.

There are two different consistency consultation processes under the CZMA, which are based on whether the proposed project is a Federal agency activity (see 15 CFR §§ 930.30-930.46) or involves an applicant seeking a permit, license, or other authorization from a Federal agency (see 15 CFR §§ 930.50-930.66). There may also be situations in which a proposed project may require compliance with both the Federal agency consistency consultation process and the applicant consistency consultation process. For example, if an applicant proposes to build a



runway requiring FAA approval, which would also require FAA installation of navigational aids, both the FAA and the applicant would need to complete the consistency consultation process.

Note that consistency consultation under the CZMA is only applicable in states with an approved coastal zone management plan. Under this program, state governments design unique coastal zone management programs which are subsequently approved by NOAA. Fulfilling the FAA's obligations under the CZMA may require conducting consultation with the affected state's coastal management program office.

Currently, thirty-four out of thirty-five eligible coastal states, U.S. territories, and commonwealths have approved coastal zone management plans. See <http://coastalmanagement.noaa.gov/mystate/welcome.html> for a list of those states and U.S. territories with approved coastal zone management plans. As of July 1, 2011, Alaska no longer participates in the National Coastal Zone Management Program.

The two consistency consultation processes are described below. Some common definitions used in the consistency consultation process are provided in the text box below.

Note that full consistency with the coastal zone management program may be prohibited by existing laws and legal authorities (such as aviation laws and safety standards). In this case, the FAA may proceed with the action, regardless of a state agency's objection. The FAA must provide the state agency with a written statement citing the statutory provision or legal authority limiting the FAA's discretion to comply with the coastal zone management program. The EA or EIS should state that the FAA provided to the state agency a written statement citing the statutory provisions or other legal authority that limited FAA's discretion to comply with the coastal management program.

#### ***Consistency Consultation Process for FAA Activities***

The FAA must ensure that all development activities and other direct FAA actions meet the consistency requirements of the state's coastal management program to the extent practicable. The consistency consultation process for FAA actions is described in Exhibits 4-2 and 4-3 below.

*A negative determination* is the FAA's written determination that an FAA action will have no reasonably foreseeable effect on any coastal use or resource.

*A consistency determination* is the FAA's written determination regarding how the FAA action would be consistent with the state's coastal zone management plan.

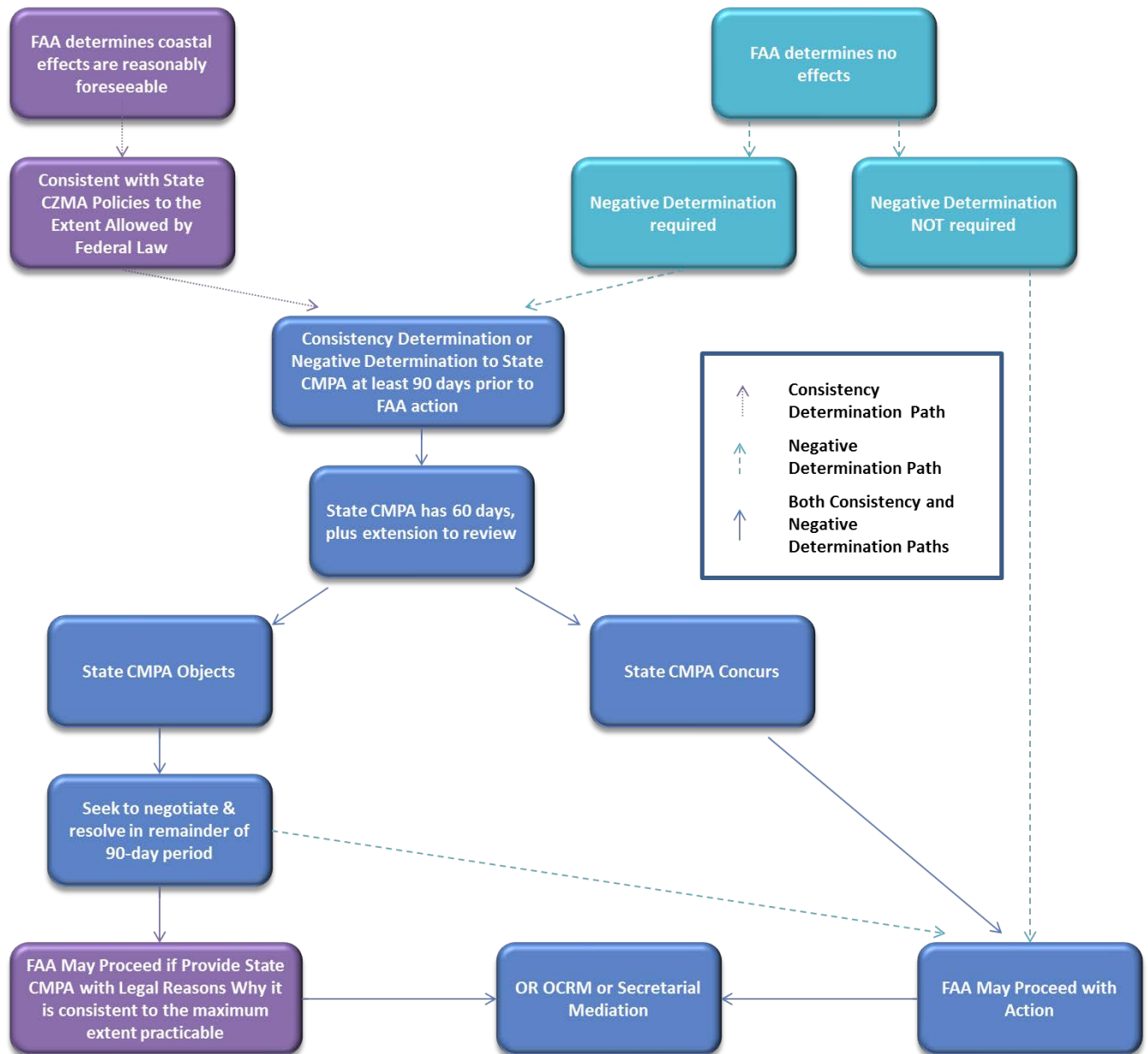
*A consistency certification* is an applicant-prepared statement that specifies how the proposed activity complies with and will be conducted in a manner consistent with the state's coastal zone management program.

**Exhibit 4-2. Consistency Consultation Process for FAA Activities**

Step	Action
1	<p>The FAA determines whether the proposed action or alternative(s) may result in reasonably foreseeable effects to coastal resources in the study area (see 15 CFR § 930.33). Effects are determined by looking at reasonably foreseeable direct and indirect effects on any coastal use or resource.</p> <ul style="list-style-type: none"> <li>• If the FAA determines that there are <u>no</u> reasonably foreseeable effects to coastal resources or uses, proceed to Step 2 below (see light blue negative determination path in Exhibit 4-3).</li> <li>• If the FAA determines that there are <u>are</u> reasonably foreseeable effects to coastal resources or uses, proceed to Step 4 below (see purple consistency determination path in Exhibit 4-3).</li> </ul>
2	<p>The FAA determines whether preparation of a negative determination is required. A negative determination is required when:</p> <ol style="list-style-type: none"> <li>1. The action was previously identified by the state agency responsible for the coastal management program (the state agency) as an action that would result in reasonably foreseeable coastal effects or uses;</li> <li>2. The action is similar to other activities that have required a consistency determination in the past; or</li> <li>3. The agency has prepared a consistency assessment for the action and has later determined that it would not result in coastal effects (see 15 CFR § 930.35(a)).</li> </ol> <ul style="list-style-type: none"> <li>• If a negative determination is <u>not</u> required, the FAA has no further obligations under the CZMA, and no further analysis is needed in the NEPA document.</li> <li>• If a negative determination <u>is</u> required, see Step 3 below.</li> </ul>
3	<p>The FAA prepares a negative determination, and submits this negative determination to the state agency at least 90 days prior to implementation of the action.</p> <ul style="list-style-type: none"> <li>• The state agency has at least 60 days to respond to the FAA's negative determination. <ul style="list-style-type: none"> <li>○ If the state agency <u>concur</u>s with the negative determination, the FAA has no further obligations under the CZMA, and no further analysis is needed in the NEPA document. Any consultation documentation between the FAA and the state agency, including the FAA's negative determination and the state's concurrence letter, should be included in the FAA's NEPA documentation (e.g., as an appendix).</li> <li>○ If the agency does not respond to the FAA's negative determination within 60 days, the FAA may presume concurrence with the negative determination.</li> <li>○ If the state agency does <u>not</u> concur with the negative determination, a consistency determination may be submitted, or the FAA and the state agency may try to resolve their differences during the remainder of the 90-day period (see Step 5 below).</li> </ul> </li> </ul>
4	<p>The FAA prepares a consistency determination (see 15 CFR § 930.41) and submits it to the state agency at least 90 days prior to implementation of the action.</p> <ul style="list-style-type: none"> <li>• The state agency has at least 60 days to respond to the FAA's consistency determination. <ul style="list-style-type: none"> <li>○ If the state agency <u>concur</u>s with the consistency determination, the FAA has no further obligations under the CZMA, and no further analysis is needed in the NEPA document. Any consultation documentation between the FAA and the state agency, including the FAA's consistency determination and the state's concurrence letter, should be included in the FAA's NEPA document (e.g., as an appendix).</li> <li>○ If the state agency does not respond to the FAA's consistency determination within 60 days, the FAA may presume concurrence with the consistency determination.</li> <li>○ If the state agency does <u>not</u> concur with the consistency determination, the FAA and the state agency may try to resolve their differences during the remainder of the 90-day period (see Step 5 below).</li> </ul> </li> </ul>

Step	Action
5	As stated in Steps 3 and 4 above, if the state agency objects to the FAA's negative determination or consistency determination, the FAA and the state agency may try to resolve their differences during the remainder of the 90-day period. If the parties are unable to resolve their differences by the end of the 90-day period, see Step 6 below.
6	<p>If the parties are unable to resolve the objection during the 90-day period:</p> <ul style="list-style-type: none"> <li>• The FAA may proceed over the state agency's objection if: <ul style="list-style-type: none"> <li>o The FAA clearly describes, in writing, how the action is "consistent to the maximum extent practicable" (see definition at 15 CFR § 930.32), and how full consistency is prohibited by existing law applicable to the FAA; or</li> <li>o The FAA has concluded that the proposed action and alternative(s) are fully consistent with the enforceable policies of the state agency, though the state agency objects.</li> </ul> </li> </ul> <p>In these cases, the FAA must notify the state of its decision to proceed before implementation of the action begins (see 15 CFR § 930.43(b)-(e)); or</p> <ul style="list-style-type: none"> <li>• The FAA may delay until issues are resolved using the dispute resolution mechanism in 15 CFR §§ 930.110- 930.116.</li> </ul>

**Exhibit 4-3. FAA Coastal Consistency Flow Chart<sup>a</sup>**



<sup>a</sup> CMPA = Coastal Management Program Agency; OCRM = NOAA’s Office of Ocean and Coastal Resource Management

### ***Consistency Consultation Process for Applicants Seeking an FAA License, Permit, or Other Authorization***

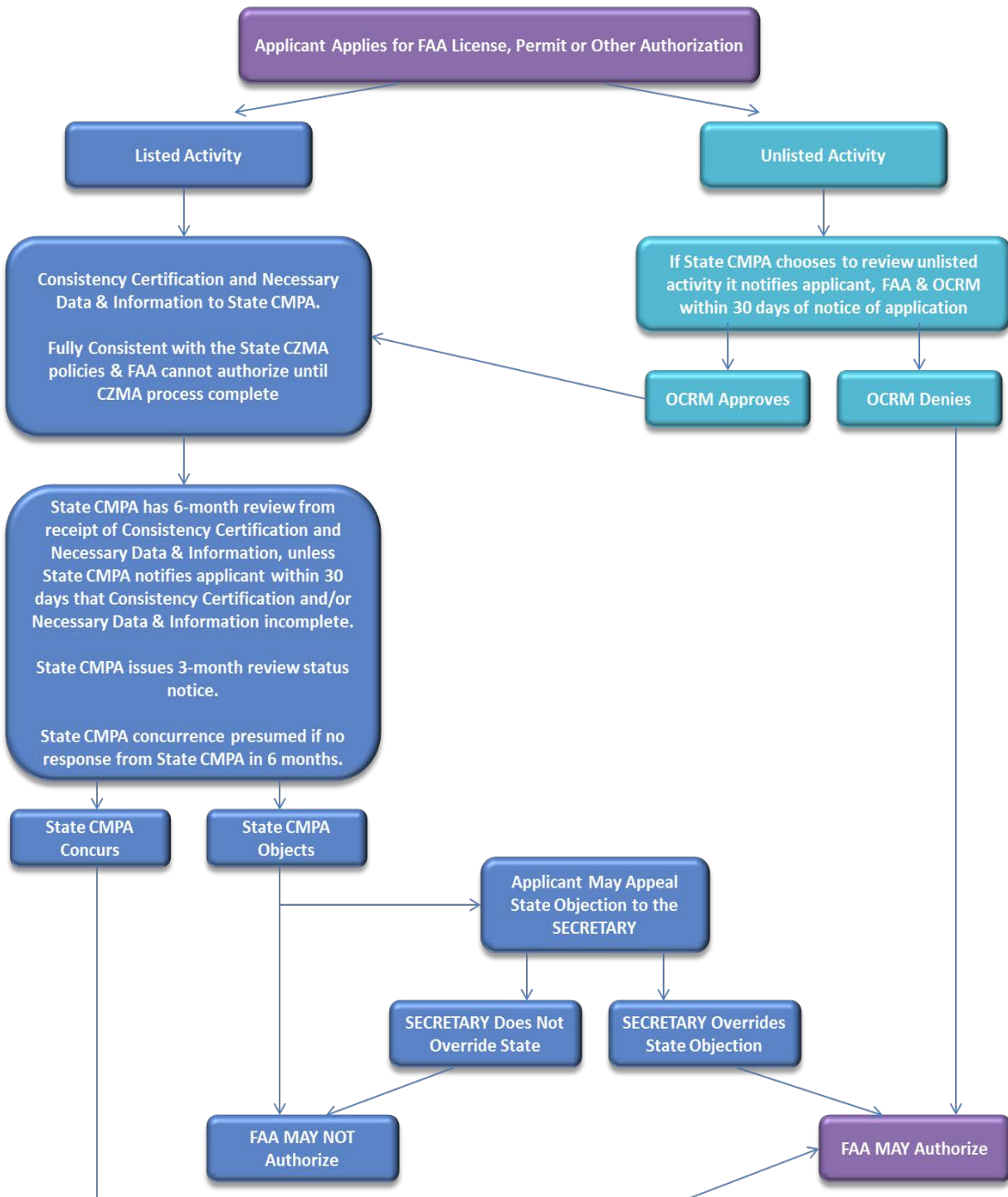
The FAA may not issue a license, permit, or authorization to an applicant unless an applicant's proposed action meets the consistency requirements of the state's coastal management program. A license or permit means any authorization that an applicant is required by law to obtain in order to conduct activities affecting any land or water use or natural resource of the coastal zone and that any Federal agency is empowered to issue to an applicant. The consistency consultation process for applicants seeking an FAA license, permit, or authorization is described in Exhibits 4-4 and 4-5 below.

#### **Exhibit 4-4. Consistency Consultation Process for Applicant Seeking an FAA License, Permit, or Other Authorization**

<b>Step</b>	<b>Action</b>
1	<p>The applicant determines if the FAA license, permit, or other authorization being applied for is listed as an activity in the state agency's coastal management plan.</p> <ul style="list-style-type: none"> <li>• If the activity is not listed, proceed to Steps 2 and 3 below (see light blue unlisted activity path in Exhibit 4-5).</li> <li>• If the activity is listed, proceed to Step 4 below (see dark blue listed activity path in Exhibit 4-5).</li> </ul>
2	<p>The applicant or the FAA provides written notice of the submission of an application for an FAA license, permit or authorization for an unlisted activity to the state agency (see 15 CFR § 930.54(a)(2) for more information). The state agency decides if it wants to review the activity for consistency.</p> <ul style="list-style-type: none"> <li>• If the state agency chooses not to review the unlisted activity, the FAA may issue the license, permit, or other authorization (note that the agency waives its consistency rights if it does not respond in 30 days). The FAA should include any correspondence between the applicant and the state agency in the FAA's NEPA document (e.g., as an appendix).</li> <li>• If the state agency chooses to review the unlisted activity, the state agency will notify the applicant, the FAA, and NOAA's Office of Ocean and Coastal Resource Management (OCRM) within 30-days (see Step 3 below).</li> </ul>
3	<p>If the state agency chooses to review the unlisted activity, OCRM must approve the review (see 15 CFR § 930.54(b)).</p> <ul style="list-style-type: none"> <li>• If OCRM denies the review, the FAA may issue the license, permit, or other authorization. The FAA should include any correspondence between the applicant, the state agency, and OCRM in the FAA's NEPA document (e.g., as an appendix).</li> <li>• If OCRM approves the review, the applicant must follow the steps for a listed activity. Proceed to Step 5 below (see dark blue listed activity path in Exhibit 4-5).</li> </ul>
4	<p>If the license, permit, or authorization is a listed activity under the state's coastal management plan, the applicant determines whether the action would take place in the coastal zone or outside the coastal zone.</p> <ul style="list-style-type: none"> <li>• If the action would take place outside the coastal zone, the applicant determines if the action would take place in a designated geographic location listed in that state's coastal management program agency (see 15 CFR § 930.53(a)(1)). <ul style="list-style-type: none"> <li>○ If the applicant determines that the action would take place outside of the coastal zone and in a geographic location not listed in the state's coastal management program, the applicant must follow the steps for an unlisted activity (see Steps 2 and 3 and light blue unlisted activity path in Exhibit 4-5).</li> </ul> </li> <li>• If the action would take place inside the coastal zone or outside the coastal zone and in a designated geographic location listed in that state's coastal management program, proceed to Step 5 below.</li> </ul>

Step	Action
5	<p>The applicant prepares a consistency certification and necessary data and information and submits it to the state agency (see 15 CFR §§ 930.57-930.58 for more information).</p> <ul style="list-style-type: none"> <li>• The state agency has 6 months to review the consistency certification, data, and information (15 CFR § 930.62). <ul style="list-style-type: none"> <li>○ The applicant must be notified by the state agency within 30 days if insufficient information was submitted (15 CFR § 930.60).</li> <li>○ The state agency will issue the applicant a 3 month review status notice (15 CFR § 930.62).</li> </ul> </li> </ul>
6	<p>After 6 months:</p> <ul style="list-style-type: none"> <li>• If the state agency concurs, the FAA may issue the license, permit, or other authorization (note that if no response is received from the state agency after 6 months, state concurrence with the certification is presumed). The FAA should include any documentation between the applicant and the state agency, including the consistency certification and the state agency's concurrence letter, in the FAA's NEPA document (e.g., as an appendix).</li> <li>• If the state agency objects, the FAA may not issue the license, permit, or other authorization (see Step 7 below).</li> </ul>
7	<p>If the state agency objects to the consistency certification, the applicant may appeal the objection to the Secretary of Commerce who may override the state agency objection (see 15 CFR part 930 subpart H).</p> <ul style="list-style-type: none"> <li>• If the Secretary overrides the state agency objection, the FAA may issue the license, permit, or other authorization. The FAA should include any documentation between the applicant, the state agency, and the Secretary in the FAA's NEPA document (e.g., as an appendix).</li> <li>• If the Secretary does not override the state objection, the FAA may not issue the license, permit, or other authorization.</li> </ul>

**Exhibit 4-5. Coastal Consistency Flow Chart for Applicant Seeking FAA License, Permit, or Other Authorization**



#### 4.1.1.2. Coastal Barrier Resources Act

If an FAA proposed action or its alternative(s) would occur on land within the Coastal Barrier Resources System (CBRS) and involve FAA funding for development, the FAA must initiate consultation with the USFWS or FEMA to solicit comments on the proposed action and alternative(s). The USFWS must have the opportunity to comment on the proposed action before the FAA may make a decision to implement the proposed action. The USFWS will determine if the proposed action is consistent with the CBRA. Any consultation documentation that results from coordination under the CBRA should be included in the FAA's NEPA document (e.g., an appendix). Project-related impacts on coastal resource biotic resources and water quality may be described in the NEPA document's CBRA section or in the sections of the NEPA document addressing these biotic and water quality issues. Executive Order 13089, *Coral Reef Protection*

Under this Executive Order, U.S. coral reef ecosystems are defined to mean those species, habitats, and other natural resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States. When a proposed FAA action may affect U.S. coral reef ecosystems, the FAA should, subject to the availability of appropriations, provide for implementation of measures needed to research, monitor, manage, and restore affected ecosystems, including, but not limited to, measures reducing impacts from pollution, sedimentation, and fishing. To the extent consistent with statutory responsibilities and procedures, these measures should be developed in cooperation with the U.S. Coral Reef Task Force and fishery management councils and in consultation with affected states, territorial, commonwealth, and local government agencies, tribes, nongovernmental organizations, the scientific community, and commercial interests as part of the U.S. Coral Reef Initiative. Refer to the National Action Plan for Coral Reef Conservation at: <http://www.coralreef.gov/about/CRTFAxnPlan9.pdf> and NOAA's Coral Reef Information System (CoRIS) at: <http://coris.noaa.gov/> for further information regarding impacts to coral reefs and marine protected areas.

## 4.2. Affected Environment

When defining the study area for coastal resources, be sure to consider indirect impacts that may result from construction or operations activities such as light emissions, noise, air emissions, or changes to water quality or quantity.

The following sources may be useful in gathering information regarding coastal resources:

- NOAA's list of State Coastal Zone Boundaries at: <http://coastalmanagement.noaa.gov/mystate/docs/StateCZBoundaries.pdf> to determine the boundaries of the coastal zone in the study area;
- NOAA's OCRM Office website at: <http://coast.noaa.gov/> for additional information regarding state coastal management programs and data;
- NOAA's Digital Coast application at: <http://coast.noaa.gov/digitalcoast/> provides multiple coastal resource data sets that can be used to address coastal resource issues;
- USFWS CBRS unit maps at: <http://www.fws.gov/CBRA/Maps/index.html> identify designated areas of the CBRS; and



- ReefGIS online maps at: [http://www.reefbase.org/gis\\_maps/default.aspx](http://www.reefbase.org/gis_maps/default.aspx) provide an interactive map that displays coral reef location data and information worldwide.

### **4.3. Environmental Consequences**

Impacts to coastal resources may result from construction within the coastal zone that leads to a loss of a natural flood control area, resulting in increased flooding in the study area. Alternately, creation of a new impermeable surface, such as a runway (even if outside of the designated CZMA coastal zone), could lead to increased run-off which could affect water quality in nearby coastal waters. In addition, an increase in facility lighting due to a proposed project could affect wildlife such as sea turtles nesting on nearby shorelines.

#### **4.3.1. Significance Determination**

The FAA has not established a significance threshold for coastal resources in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts on coastal resources (see Exhibit 4-1 of FAA Order 1050.1F). Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to coastal resources include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Be inconsistent with the relevant state coastal zone management plan(s);
- Impact a coastal barrier resources system unit (and the degree to which the resource would be impacted);
- Pose an impact to coral reef ecosystems (and the degree to which the ecosystem would be affected);
- Cause an unacceptable risk to human safety or property; or
- Cause adverse impacts to the coastal environment that cannot be satisfactorily mitigated.

### **4.4. Mitigation**

Some examples of potential measures to mitigate impacts to coastal resources include:

- Moving the proposed project outside of the coastal zone;
- Tailoring a project to promote consistency with Federally-approved coastal zone management plans; and
- Incorporating any site-specific recommendations proposed by relevant Federal or state agencies having jurisdiction over the coastal resource as a result of any consultation.

## 5. Department of Transportation Act, Section 4(f)

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Section 4(f) of the U.S. DOT Act of 1966 (now codified at 49 U.S.C. § 303) protects significant publicly owned parks, recreational areas, wildlife and waterfowl refuges, and public and private historic sites. Section 4(f) provides that the Secretary of Transportation may approve a transportation program or project requiring the use of publicly owned land off a public park, recreation area, or wildlife or waterfowl refuge of national, state, or local significance, or land of an historic site of national, State, or local significance, only if there is no feasible and prudent alternative to the using that land and the program or project includes all possible planning to minimize harm resulting from the use.

Section 4(f) applies only to agencies within the U.S. DOT. If more than one DOT agency is involved in a proposed project that involves Section 4(f), the agency acting as the NEPA lead normally takes the lead on Section 4(f). If the FAA is engaged with a non-DOT agency on the NEPA review of a proposed project involving Section 4(f), the FAA must take the lead on Section 4(f) compliance.<sup>1</sup>

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<sup>1</sup> Special Use Airspace actions are exempt from the requirements of Section 4(f).

## 5.1. Regulatory Setting

Exhibit 5-1 lists the primary statutes and regulations related to Section 4(f) impacts.

**Exhibit 5-1. Statutes and Regulations Related to Section 4(f) Properties**

Statute	Location in U.S. Code or Public Law Citation	Implementing Regulation	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Land and Water Conservation Fund Act of 1965	16 U.S.C. §§ 4601-4 et seq.	36 CFR part 59 et seq.	DOI	Section 6(f) provides funds for buying or developing public use recreational lands through grants to local and state governments. Section 6(f)(3) prevents conversion of lands purchased or developed with Land and Water Conservation Fund Act funds to non-recreation uses, unless the Secretary of the DOI, through the NPS, approves the conversion.
U.S. Department of Transportation Act - Section 4(f)	49 U.S.C. § 303	23 CFR part 774 et seq. <sup>2</sup>	DOT	Protects certain properties from use for DOT projects unless the relevant DOT agency (e.g., the FAA) determines there is no feasible and prudent alternative and a project includes all possible planning to minimize harm.
Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) – Section 6009	49 U.S.C. § 303	23 CFR part 774 et seq.	DOT	Amended Section 4(f) to simplify the process and approval of projects that have only <i>de minimis</i> impacts on 4(f) properties.
U.S. Department of Defense Reauthorization	P.L. 105-85, Div. A, Title X, Section 1079, Nov. 18, 1997, 111 Stat. 1916.	Not applicable	DOD	Exempts military flight operations and designation of airspace for such operations from Section 4(f).

<sup>a</sup> U.S.C. = United States Code; CRF = Code of Federal Regulations; DOT = U.S. Department of Transportation; DOD = U.S. Department of Defense; DOI = U.S. Department of the Interior; NPS = National Park Service

<sup>2</sup> These regulations were issued by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), and are not binding on the FAA. However, they may be used as guidance to the extent relevant to aviation.

Procedural requirements for complying with Section 4(f) are set forth in DOT Order 5610.1C. The FAA also uses Federal Highway Administration/ Federal Transit Administration (FHWA/FTA) regulations in 23 CFR part 774 (73 *Federal Register* 13368 (March 12, 2008) and 73 *Federal Register* 31609 (June 3, 2008)) and FHWA guidance (e.g., Section 4(f) Policy Paper,<sup>3</sup> 77 *Federal Register* 42802 (July 20, 2012)). These requirements are not binding on the FAA; however, the FAA may use them as guidance to the extent relevant to aviation projects. See the FHWA website for further information at: <http://environment.fhwa.dot.gov/4f/index.asp>.

### **5.1.1. Consultations, Permits, and Other Approvals**

The FAA is responsible for soliciting and considering the comments of the DOI and, where appropriate, U.S. Department of Agriculture (USDA), or Housing and Urban Development (HUD), as well as the appropriate official(s) with jurisdiction over the Section 4(f) property. Evaluations and determinations under Section 4(f) must reflect consultation with these Departments and officials. However, the ultimate decisionmaker for Section 4(f) determinations is the FAA.

Consultation with agencies having jurisdiction over any public parks, recreation areas, waterfowl or wildlife refuges, or historic sites assists in identifying Section 4(f) properties. When a draft Section 4(f) evaluation is prepared, it must be provided to the official(s) with jurisdiction over the Section 4(f) resource, DOI, and as appropriate, to the USDA and HUD. The FAA normally allows a minimum 45-day review period. For DOI, Section 4(f) evaluations should be sent to:

Director, Office of Environmental Policy and Compliance  
U.S. Department of the Interior  
1849 C Street, N.W. (MS 2462)  
Washington, DC 20240

DOI requests one copy of the draft Section 4(f) evaluation in electronic format (CD/DVD, or any other widely used electronic storage media) and the URL for review documents available on the Internet. If no electronic version is available, provide 12 to 18 copies of the draft document depending on the proposed action's geographic location and scope. For the review of final Section 4(f) evaluations, DOI requests one copy in electronic format (CD/DVD, or any other widely used electronic storage media) and the URL for review documents available on the Internet. If no electronic version is available, provide 6 to 9 copies of the final document depending on the proposed action's geographic location and scope (see DOI Environmental Review Distribution Requirements dated June 6, 2012, available at: [http://www.doi.gov/pmb/oepc/nrm/upload/Environmental\\_Review\\_Process.pdf](http://www.doi.gov/pmb/oepc/nrm/upload/Environmental_Review_Process.pdf)). DOI has published a handbook to provide guidance in the review of and the preparation of DOI comments on Section 4(f) evaluations that is available at [http://www.doi.gov/pmb/oepc/nrm/upload/4f\\_handbook.pdf](http://www.doi.gov/pmb/oepc/nrm/upload/4f_handbook.pdf)

Many national forests under the jurisdiction of the U.S. Forest Service (USFS) of the USDA serve as multiple-use land holdings. If the proposed project uses land of a national forest, coordination with the USDA as the official with jurisdiction over the resource would be appropriate in determining the purposes served by the land holding and the resulting extent of

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<sup>3</sup> <http://environment.fhwa.dot.gov/4f/4fpolicy.pdf>

Section 4(f) applicability to the land holding. HUD would be involved only in cases where HUD has an interest in a Section 4(f) property.

In the case of public parks, recreation areas, and wildlife and waterfowl refuges, the officials with jurisdiction are the officials of the agency or agencies that own or administer the property in question, and have authority to represent the agency on matters related to the property. In the case of historic sites, the official with jurisdiction is the State Historic Preservation Officer (SHPO), or the Tribal Historic Preservation Officer (THPO) if the property is located on tribal land. If the property is on tribal land, but the tribe has not assumed the responsibilities of the SHPO, a representative designated by the tribe should be recognized as an official with jurisdiction in addition to the SHPO. When the Advisory Council on Historic Preservation is involved under Section 106, the Council is also an official with jurisdiction for purposes of Section 4(f). If a Section 4(f) property is a National Historic Landmark, the NPS is also an official with jurisdiction for purposes of Section 4(f) (see Chapter 8).

If Federal grant money was used to acquire the land involved (e.g., open space under HUD and various conservation programs under DOI), the Section 4(f) documentation must include evidence of, or reference to, appropriate communication with the grantor agency. Requests for conversion of recreation lands aided by DOI's Land and Water Conservation Fund (i.e., Section 6(f) lands) should be submitted to the State Liaison Officer, who in turn submits it to the Regional Director of the NPS for approval. Replacement, satisfactory to the Secretary of the Interior, by lands of equal value, location, and recreation usefulness is specifically required for Section 6(f) lands and for certain other lands falling under the jurisdiction of DOI.

Evidence of concurrence or a description of efforts to obtain concurrence of Federal, state, or local officials having jurisdiction over the Section 4(f) property regarding the proposed action and/or alternative(s) that require the use of the Section 4(f) property and the measures planned to minimize harm must be part of the Section 4(f) documentation.

## 5.2. Affected Environment

The FAA should identify as early as practicable in the planning process section 4(f) properties that implementation of the proposed action and alternative(s) could affect.

Section 4(f) properties include:

- parks and recreational areas of national, state, or local significance that are both publicly owned and open to the public;
- publicly owned wildlife and waterfowl refuges of national, state, or local significance that are open to the public; and
- historic sites of national, state, or local significance in public or private ownership regardless of whether they are open to the public.

A property must be a significant resource for Section 4(f) to apply. Any part of a Section 4(f) property is presumed to be significant unless there is a statement of insignificance relative to the entire property by the Federal, state, or local official having jurisdiction over the property. Any statement of insignificance is subject to review by the FAA.

Section 4(f) protects only those historic or archeological properties that are listed, or eligible for inclusion, on the National Register of Historic Places (NRHP), except in unusual circumstances.

Historic sites are normally identified during the process required under Section 106 of the National Historic Preservation Act (NHPA), 54 U.S.C. § 300101 et seq., and its implementing regulations (36 CFR part 800). If an official formally provides information to indicate that a historic site not on or eligible for inclusion on the NRHP is significant, the responsible FAA official may determine that it is appropriate to apply Section 4(f). If the responsible FAA official finds that Section 4(f) does not apply, the NEPA document should include the basis for this finding (which may be based on reasons why the property was not eligible for the NRHP).

Where Federal lands are administered for multiple uses, the Federal official having jurisdiction over the lands shall determine whether the lands are in fact being used for park, recreation, wildlife, waterfowl, or historic purposes. National wilderness areas may serve similar purposes and shall be considered subject to Section 4(f) unless the controlling agency specifically determines that the lands are not being used for Section 4(f) purposes.

When a property is owned by and currently designated for use by a transportation agency and a park or recreation use of the land is being made only on an interim basis, the property would not ordinarily be considered to be subject to Section 4(f). The responsible FAA official or applicant should ensure that any lease or agreement includes specific terms clarifying that the use of the property for a park or recreational purpose is temporary. A use that extends over a period of years may be sufficiently long that it would no longer be considered to be interim or temporary, if challenged.

Where the use of a property is changed by a state or local agency from a Section 4(f) type use to a transportation use in anticipation of a request for FAA approval, Section 4(f) will be considered to apply, even though the change in use may have taken place prior to the request for approval or prior to any FAA action on the matter. This is especially true where the change in use appears to have been undertaken in an effort to avoid the application of Section 4(f).

The Section 4(f) regulations provide that when a property is formally reserved for a future transportation facility before or at the same time a park, recreation area or wildlife and waterfowl refuge is established and concurrent or joint planning or development of the transportation facility and the Section 4(f) resource occurs, then any resulting impacts of the transportation facility will not be considered a use as defined by 23 CFR § 774.17. Examples of such concurrent or joint planning or development include, but are not limited to: (1) designation or donation of property for the specific purpose of such concurrent development by the entity with jurisdiction or ownership of the property for both the potential transportation facility and the Section 4(f) property; or (2) designation, donation, planning, or development of property by two or more governmental agencies with jurisdiction for the potential transportation facility and the Section 4(f) property, in consultation with each other. (23 CFR §§ 774.11(i)(1) and (2)).

### **5.3. Environmental Consequences**

An initial assessment should be made to determine whether the proposed action and alternative(s) would result in the use of any of the properties to which Section 4(f) applies. If physical use or constructive use of a Section 4(f) property is involved, as further described in Sections 5.3.1 and 5.3.2 below, the potential impacts of the proposed action and alternative(s) on the Section 4(f) property must be described in detail. The description of the affected Section 4(f) property should include the location, size, activities, patronage, access, unique or irreplaceable qualities, relationship to similarly used lands in the vicinity, jurisdictional entity, and other

factors necessary to understand and convey the extent of the impacts on the resource. Maps, plans, photos, or drawings may assist in describing the property and understanding the potential use, whether physical taking or constructive use. Any statements regarding the property's significance by officials having jurisdiction should be documented and attached.

### **5.3.1. Physical Use of Section 4(f) Property**

A Section 4(f) use would occur if the proposed action or alternative(s) would involve an actual physical taking of Section 4(f) property through purchase of land or a permanent easement, physical occupation of a portion or all of the property, or alteration of structures or facilities on the property.

A temporary occupancy of a Section 4(f) property for project construction-related activities is usually so minimal that it does not constitute a use within the meaning of Section 4(f). However, a temporary occupancy would be considered a use if:

- The duration of the occupancy of the Section 4(f) property is greater than the time needed to build a project and there is a change in ownership of the land,
- The nature and magnitude of changes to the 4(f) property are more than minimal,
- Anticipated permanent adverse physical impacts would occur and a temporary or permanent interference with Section 4(f) activities or purposes would occur,
- The land use is not fully returned to existing condition, or
- There is no documented agreement with appropriate agencies having jurisdiction over the Section 4(f) property.

If a project would physically occupy an NRHP-listed or eligible property containing archeological resources that warrant preservation in place, there would be a Section 4(f) use. Although there may be some physical taking of land, Section 4(f) does not apply to NRHP-listed or eligible archeological properties where the responsible FAA official, after consultation with the SHPO/THPO, determines that the archeological resource is important chiefly for data recovery and is not important for preservation in place.

### **5.3.2. Constructive Use of Section 4(f) Property**

Use, within the meaning of Section 4(f), includes not only the physical taking of such property, but also "constructive use." The concept of constructive use is that a project that does not physically use land in a park, for example, may still, by means of noise, air pollution, water pollution, or other impacts, dissipate its aesthetic value, harm its wildlife, restrict its access, and take it in every practical sense. Constructive use occurs when the impacts of a project on a Section 4(f) property are so severe that the activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the Section 4(f) property that contribute to its significance or enjoyment are substantially diminished. This means that the value of the Section 4(f) property, in terms of its prior significance and enjoyment, is substantially reduced or lost. For example, noise would need to be at levels high enough to have negative consequences of a substantial nature that amount to a taking of a park or portion of a park for transportation purposes.

The responsible FAA official must consult all appropriate Federal, state, and local officials having jurisdiction over the affected Section 4(f) properties when determining whether project-related impacts would substantially impair the resources. Following consultation and assessment of potential impacts, the FAA is solely responsible for Section 4(f) applicability and determinations.

The land use compatibility guidelines in 14 CFR part 150 (the part 150 guidelines) may be relied upon by the FAA to determine whether there is a constructive use under Section 4(f) where the land uses specified in the part 150 guidelines are relevant to the value, significance, and enjoyment of the Section 4(f) lands in question. The FAA may rely on the part 150 guidelines in evaluating constructive use of lands devoted to traditional recreational activities. The FAA may primarily rely upon the day night average sound levels (DNL) in part 150 rather than single event noise analysis because DNL: (1) is the best measure of significant impact on the quality of the human environment, (2) is the only noise metric with a substantial body of scientific data on the reaction of people to noise, and (3) has been systematically related to Federal compatible land use guidelines.

The FAA may also rely upon the part 150 guidelines to evaluate impacts on historic properties that are in use as residences. The part 150 guidelines may be insufficient to determine the noise impact on historic properties where a quiet setting is a generally recognized purpose and attribute, such as a historic village preserved specifically to convey the atmosphere of rural life in an earlier era or a traditional cultural property. If architecture is the relevant characteristic of a historic neighborhood, then project-related noise would not substantially impair the characteristics that led to eligibility for or listing on the NRHP. As a result, noise would not constitute a constructive use, and Section 4(f) would not be triggered. A historic property would not be considered to be constructively used for Section 4(f) purposes when the FAA issues a finding of no historic properties affected or no adverse effect under Section 106 of the NHPA, 54 U.S.C. § 300101 et seq.. Findings of adverse effects do not automatically trigger Section 4(f) unless the effects would substantially impair the affected resource's historical integrity. The FAA is responsible for complying with Section 106 of the NHPA regardless of the disposition of Section 4(f).

When assessing use of Section 4(f) properties located in a quiet setting and where the setting is a generally recognized feature or attribute of the site's significance, the FAA carefully evaluates reliance on the part 150 guidelines. The FAA must weigh additional factors in determining whether to apply the thresholds listed in the part 150 guidelines to determine the significance of noise impacts on noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks, national wildlife and waterfowl refuges, and historic sites including traditional cultural properties). The FAA may use the part 150 land use compatibility table as a guideline to determine the significance of noise impacts on Section 4(f) properties to the extent that the land uses specified bear relevance to the value, significance, and enjoyment of the lands in question. However, the part 150 guidelines may not be sufficient for all historic sites as described above, and the part 150 guidelines do not adequately address the impacts of noise on the expectations and purposes of people visiting areas within a national park or national wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.



### 5.3.3. *De Minimis* Impact Determination

The FAA may make a *de minimis* impact determination with respect to a physical use of Section 4(f) property if, after taking into account any measures to minimize harm, the result is either:

- a determination that the project would not adversely affect the activities, features, or attributes qualifying a park, recreation area, or wildlife or waterfowl refuge for protection under Section 4(f); or
- a Section 106 finding of no adverse effect or no historic properties affected.

The FAA's NEPA document must include documentation sufficient to support the above results, including the measures to minimize harm that the FAA is relying on to make the *de minimis* impact determination. The FAA must ensure that mitigation measures are implemented. A *de minimis* impact determination is not a full and complete Section 4(f) evaluation. It does not require an analysis and finding that there are no feasible and prudent alternatives or a finding that all possible planning has been done to minimize harm.

A *de minimis* impact determination is not appropriate for constructive use of a Section 4(f) property because constructive use is defined as substantial impairment, and substantial impairment cannot be considered a *de minimis* impact.

A *de minimis* impact determination requires agency coordination and public involvement. For parks, recreation areas, and wildlife and waterfowl refuges, the officials with jurisdiction over the property must be informed of the FAA's intent to make a *de minimis* impact determination, after which the FAA must provide an opportunity for public review and comment. After considering any public comments and if the officials with jurisdiction concur in writing that the project would not adversely affect the activities, features, or attributes that make the property eligible for Section 4(f) protection, the FAA may finalize a *de minimis* impact determination. For historic sites, the FAA must consult the consulting parties identified in accordance with 36 CFR part 800, and inform the officials with jurisdiction of the intent to make a *de minimis* impact determination and must concur in a finding of no adverse effect or no historic properties affected. Compliance with 36 CFR part 800 satisfies the public involvement and agency coordination requirement for *de minimis* findings for historic sites.

For more information on *de minimis* impact determinations, please refer to 23 CFR §§ 774.3 and 774.17, the FHWA's Section 4(f) at a Glance at:

<http://www.environment.fhwa.dot.gov/4f/4fAtGlance.asp>, and the FHWA's Section 4(f) policy paper at: <http://www.environment.fhwa.dot.gov/4f/4fpolicy.asp>.

### 5.3.4. Section 4(f) Evaluation

When a project would involve the use of a Section 4(f) property and the FAA cannot make a *de minimis* impact determination, the FAA must prepare a Section 4(f) evaluation. The FAA should incorporate the evaluation into the FAA's NEPA review and process to the fullest extent possible, but may prepare a stand-alone Section 4(f) evaluation (referred to as a Section 4(f) statement).

The Section 4(f) evaluation must sufficiently explain the purpose and need for the project, the Section 4(f) evaluation must also include adequate discussion of alternatives to support an FAA determination regarding the availability of feasible and prudent alternatives. to the use of the

Section 4(f) property. The no action alternative is one avoidance alternative. An alternative that would involve any use of Section 4(f) property is not an avoidance alternative.

The evaluation must determine if there is a feasible and prudent alternative that would avoid the use of the Section 4(f) property. According to the FHWA/FTA regulation at 23 CFR § 774.17:

(1) A *feasible and prudent* alternative is one that avoids using Section 4(f) property and does not cause other severe problems of a magnitude that substantially outweighs the importance of protecting the Section 4(f) property. In assessing the importance of protecting the Section 4(f) property, it is appropriate to consider the relative value of the property (i.e., some Section 4(f) properties are worthy of a greater degree of protection than others).

(2) An alternative is not feasible if it cannot be built as a matter of sound engineering judgment.

(3) An alternative is not prudent if it:

- Compromises a project to such a degree that it is unreasonable to proceed with the project in view of its stated purpose and need (i.e., the alternative does not address the purpose and need of the project);
- Results in unacceptable safety or operational problems;
- Causes, after reasonable mitigation:
  - Severe social, economic, or environmental impacts,
  - Severe disruption to established communities,
  - Severe or disproportionate impacts to minority or low-income populations, or
  - Severe impacts to environmental resources protected under other Federal statutes;
- Results in additional construction, maintenance, or operational costs of an extraordinary magnitude;
- Causes other unique problems or unusual factors; or
- Involves multiple factors above that, although individually minor, cumulatively cause unique problems or impacts of extraordinary magnitude.

Supporting documentation is required in the Section 4(f) evaluation for findings of no feasible and prudent alternatives. If the Section 4(f) evaluation identifies a feasible and prudent alternative that avoids Section 4(f) properties, the FAA may not select an alternative that uses a Section 4(f) property. If there is no feasible and prudent alternative that avoids all Section 4(f) property, the FAA may approve only the alternative that meets the purpose and need and causes the least overall harm to Section 4(f) property. The FHWA/FTA regulation at 23 CFR § 774.3(c)(1) identifies the following seven factors to be balanced in determining the alternative that causes the least overall harm:

1. The ability to mitigate adverse impacts to each Section 4(f) property (including any measures that result in benefits to the property);
2. The relative severity of the remaining harm, after mitigation, to the protected activities, attributes, or features that qualify each Section 4(f) property for protection;
3. The relative significance of each Section 4(f) property;
4. The views of the official(s) with jurisdiction over each Section 4(f) property;

5. The degree to which each alternative meets the purpose and need for the project;
6. After reasonable mitigation, the magnitude of any adverse impacts to resources not protected by Section 4(f); and
7. Substantial differences in costs among the alternatives.

In evaluating the degree of harm to Section 4(f) properties, the FAA will consider the views of officials having jurisdiction over each Section 4(f) property. The Section 4(f) evaluation will describe how the FAA considered the seven factors to determine the least overall harm, including the extent to which each alternative meets the project purpose and need. The final Section 4(f) evaluation must document the analysis and identification of the alternative that has the least overall harm.

If the Section 4(f) evaluation concludes there are no feasible and prudent alternatives to the use of Section 4(f) property, it must also document that the project includes all possible planning to minimize harm to Section 4(f) property. As defined in 23 CFR § 774.17, *all possible planning* means that all reasonable measures to minimize harm or mitigate adverse impacts must be included in the project. Mitigation measures may include those described in Section 5.4 below. In evaluating the reasonableness of measures to minimize harm, the responsible FAA official will consider the preservation purpose of the statute, the views of officials having jurisdiction over the Section 4(f) property, whether the cost of measures is a reasonable public expenditure in view of the adverse impacts on the Section 4(f) property and the benefits of the measures to the property, and impacts or benefits of the measures to communities or environmental resources outside the Section 4(f) property.

### **5.3.5. Section 4(f) Finding**

In order for the FAA to approve an action that would use Section 4(f) property, the Section 4(f) evaluation must conclude with the required finding that there is no feasible and prudent alternative that would avoid the use of Section 4(f) property and that the project includes all possible planning to minimize harm resulting from the use. Where a Finding of No Significant Impact (FONSI) is prepared, this finding must be included in the FONSI, if not included in the EA (see FAA Order 1050.1F, paragraph 6-3.b(4)). Where an Environmental Impact Statement (EIS) is prepared, this finding must be included in the final EIS if possible, and in the Record of Decision (ROD) (see FAA Order 1050.1F, paras. 7-1.2.g and 7-2.2.e). When a Categorical Exclusion (CATEX) is used for an action (see FAA Order 1050.1F, Chapter 5), the Section 4(f) finding may either be included in documentation prepared to support the use of the Categorical Exclusion (see FAA Order 1050.1F, Paragraph 5-3) or documented separately.

### **5.3.6. Requirements under Section 6(f) of the Land and Water Conservation Fund Act**

A project that would use Section 4(f) parks or recreation areas must also comply with Section 6(f) of the Land and Water Conservation Fund, 16 U.S.C. § 4601-8(f), if the property was acquired or developed with financial assistance under the Land and Water Conservation Fund State Assistance Program. Section 6(f), administered by the NPS, requires that areas funded through the program remain for public outdoor recreation use or be replaced by lands of equal value, location, and recreation usefulness.

A request to convert Land and Water Conservation Fund-assisted properties in whole or in part to uses other than public outdoor recreation must be submitted to the appropriate NPS Regional Director in writing. NPS approval is required to convert Section 6(f) lands. The NPS will consider conversion requests if the request complies with Section 4(f), information is provided that is needed to make findings required under Section 6(f), and coordination is carried out with the NPS and the state agency responsible for the Section 6(f) property. The Section 4(f) evaluation should also include evidence that applicable requirements of Section 6(f) have been met.

Refer to the NPS Land and Water Conservation Fund site to help identify Section 6(f) properties in the study area at: <http://www.nps.gov/lwcf/> and to the Section 6(f) regulations at 36 CFR § 59.3 for guidance in completing the Section 6(f) evaluation at: [http://www.nps.gov/lwcf/post\\_completion\\_compliance\\_docs/36cfr59.3.pdf](http://www.nps.gov/lwcf/post_completion_compliance_docs/36cfr59.3.pdf).

### 5.3.7. Section 4(f) Significance Determination

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for Section 4(f) properties. A significant impact would occur when: *The action involves more than a minimal physical use of a Section 4(f) resource* (see Section 5.3.1 above) *or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource* (see Section 5.3.2 above).<sup>4</sup> A significant impact under NEPA would not occur if mitigation measures eliminate or reduce the effects of the use below the threshold of significance. If a project would physically use Section 4(f) property, the FAA is responsible for complying with Section 4(f) even if the impacts are less than significant for NEPA purposes.

## 5.4. Mitigation

Section 4(f) use requires all possible planning to minimize harm. The NEPA document should provide detailed measures to minimize harm and include evidence of concurrence or efforts to obtain concurrence of appropriate officials having jurisdiction over the affected Section 4(f) property regarding such measures. Some examples of potential measures to mitigate impacts to Section 4(f) properties include:

- Changing project design to lessen the impact on the Section 4(f) property;
- Replacement of land or facilities (e.g., replacement of a neighborhood park);
- Monetary compensation to enhance the remaining segments of the affected Section 4(f) property;
- Building noise walls or installing visual or vegetative buffers to lessen adverse impacts; or
- Enhancing project access the jurisdictional agency supports (i.e., disabled access ramps).

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<sup>4</sup> A "minimal physical use" is part of the FAA's significance threshold that has been continued from FAA Order 1050.1E. It is not the same as a *de minimis* impact determination established in Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETY-LU). A *de minimis* impact determination is described in Appendix B, B-2.2.3.

Mitigation of potential adverse impacts to historic sites usually consists of measures necessary to preserve the historic integrity of the site and agreed to in accordance with 36 CFR part 800 by the FAA, the SHPO/THPO, and other consulting parties (see Chapter 8). Equal replacement of a Section 6(f) property that will be converted is required to satisfy Section 6(f) requirements. The replacement area must be at least equal to that of the converted property, including equal location and usefulness.

## 6. Farmlands

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Farmlands are defined as those agricultural areas considered important and protected by Federal, state, and local regulations. Important farmlands include all pasturelands, croplands, and forests (even if zoned for development) considered to be prime, unique, or of statewide or local importance.

### 6.1. Regulatory Setting

Exhibit 6-1 lists statutes, regulations, and other guidance regarding farmlands. See Appendix B.4 for more detailed information about these requirements.

**Exhibit 6-1. Statutes, Regulations, and Other Guidance Related to Farmlands**

Statute or Guidance	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Farmland Protection Policy Act	7 U.S.C. §§ 4201-4209	7 CFR parts 657-658	NRCS	Administered by NRCS, the Farmland Protection Policy Act regulates Federal actions with the potential to convert important farmland to non-agricultural uses.
CEQ Memorandum on the Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	45 <i>Federal Register</i> 59189, (September 8, 1980)	Not applicable	CEQ	Urges Federal agencies to include analysis of the effects of a proposed Federal agency action on prime or unique agricultural lands as an integral part of the NEPA process.
State and local regulations	Not applicable	Not applicable	Applicable state or local agency	State and local agencies adopt and implement planning and land use regulations, such as land use plans and zoning. Under NRCS regulations, federal agencies are to ensure that their programs, to the extent practicable, are compatible with state and local programs and policies to protect farmland (see 7 CFR § 658.1).

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; NRCS = Natural Resources Conservation Service; CEQ = Council on Environmental Quality

### 6.1.1. Consultations, Permits, and Other Approvals

As noted in Exhibit 6-1 above, the Farmland Protection Policy Act regulates Federal actions with the potential to convert farmland to non-agricultural uses. Specifically, the Act regulates farmland identified as prime, unique, or of statewide or local importance.

The FAA may determine whether or not the site of the proposed action or alternative(s) is prime, unique, state, or locally important farmland using criteria provided in 7 CFR § 658.5. If the FAA does not make its own determination, the FAA may elect to initiate coordination with NRCS by completing Form AD-1006, a land evaluation and site assessment system used by NRCS to determine a rating score and establish impacts to farmlands. An electronic copy of Form AD-1006, as well as instructions for completing the form, can be obtained from the NRCS website at: [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1045394.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045394.pdf)

NRCS's Farmland Protection Policy Act and its implementing regulations (7 CFR § 657.5) define prime, unique, statewide, and locally important farmlands:

*Prime farmland* is land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimal use of fuel, fertilizer, pesticides, or products.

*Unique farmland* is land used for producing high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture necessary to produce high quality crops or high yields of crops.

*Statewide and locally important farmland* is land that has been designated as "important" by either a state government (state Secretary of Agriculture or higher office), by county commissioners or by an equivalent elected body.

The process for consultation with NRCS under the Farmland Protection Policy Act is detailed in Exhibit 6-2 below. Definitions for common terms used throughout the process are provided in the text box above.

#### Exhibit 6-2. Process for Consulting with the Natural Resources Conservation Service under the Farmland Protection Policy Act

Step	Action
1	The FAA determines whether or not the site of the proposed action or alternative(s) is prime, unique farmland that is determined to be farmland of state, or local importance or the FAA requests that NRCS make the determination (see 7 CFR § 658.4).
2	<p>If the FAA elects not to make its own determination, the FAA or applicant should submit a request to the local NRCS field office on Form AD-1006, the Farmland Conversion Impact Rating Form, for determination of whether the site is farmland subject to the Farmland Protection Policy Act (the Act).</p> <p>If NRCS determines that neither the entire site, nor any part of it, is subject to the Act, the Act does not apply and NRCS will notify the FAA.</p> <p>If the site is determined by NRCS to be subject to the Act, NRCS will measure the relative value of the site as farmland on a scale of 0 to 100. NRCS will respond to the FAA's or an applicant's request within <b>10 working days</b> of receipt of Form AD-1006 except in such cases where NRCS determines that a site visit or land evaluation system design is needed. In cases where such a visit or evaluation system design is needed, NRCS will respond in <b>30 working days</b>. In the event that NRCS fails to complete its response within the required period, if further delay would interfere with construction activities, the FAA should proceed as though the site were not farmland</p>

3	After NRCS notifies the FAA or an applicant of the score of a site's relative value and the FAA applies the site assessment criteria in 7 CFR § 658.5, the FAA determines the combined score for the site. This combined score is composed of up to 100 points for relative value and up to 160 points for the site assessment, resulting in a maximum possible score of 260 points. As the point value approaches 260 points, the potential impact severity increases.
4	<p>The combined score should aid the FAA in determining the suitability of the site for protection as farmland, and therefore the relative impact of the proposed action or alternative(s) on farmland resources. In general, NRCS recommends that agencies use the following guidelines when considering the impacts of their proposed action or alternative(s) in relation to the combined score:</p> <ul style="list-style-type: none"> <li>• Sites with the highest combined scores will be regarded as most suitable for protection and sites with the lowest scores as least suitable.</li> <li>• Sites receiving a total score of less than 160 need not be given further consideration for protection, and no additional sites need be evaluated.</li> <li>• Sites receiving scores totaling 160 or more will be given increasingly higher levels of consideration for protection.</li> <li>• When making decisions on proposed actions or alternative(s) for sites receiving scores totaling 160 or more the following should be considered: <ul style="list-style-type: none"> <li>○ Use of land that is not farmland or use of existing structures;</li> <li>○ Alternative sites, locations, and designs that would serve the project purpose but convert either fewer acres of farmland or other farmland that has a lower relative value; and</li> </ul> </li> </ul> <p>Special siting requirements of the proposed action or alternative(s) and the extent to which an alternative site fails to satisfy the special siting requirements as well as the originally proposed site.</p>
5	The FAA should ensure that all consultation documentation, including Form AD-1006, is appropriately incorporated into the FAA's NEPA document (e.g., the appendix).
6	Following the conclusion of the NEPA process, once the FAA has made a final decision on a project, the FAA should return a copy of Form AD-1006 to the local NRCS field office, indicating the FAA's final decision.

## 6.2. Affected Environment

Typically, the study area for farmlands will be limited to the construction footprint of a project; however, indirect impacts could occur if access to important farmland is lost due to construction of a new airport, runway extension, commercial space launch site, or other facility.

NRCS keeps current an inventory of the prime farmland and unique farmland in the United States. This inventory identifies the extent and location of important rural lands needed to produce food, feed, fiber, forage, and oilseed crops. The FAA may request that NRCS make a determination of whether the site of the proposed action or alternative(s) contains farmland protected under the Farmland Protection Policy Act through the consultation process. This process is detailed in Exhibit 6-2 above.

For additional information on the Farm Protection Policy Act, see:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/fppa/>

States may also map farmlands, and state mapping may provide more detail than nation-wide mapping. Farmlands mapping may not be up-to-date in areas that have experienced recent growth and development, so it is important to review recent aerial photographs to ensure that areas are correctly identified in the NEPA document.



## 6.3. Environmental Consequences

Direct impacts to farmlands typically involve the conversion of farmlands to non-agricultural use. FAA actions that may result in farmland conversion include: construction of a new airport or commercial space launch site and associated facilities and infrastructure, the expansion of an existing facility, land acquisition for aviation-related use, or new or relocated access roadways and remote parking facilities.

In addition, indirect impacts to farmlands should also be considered. For example, construction or expansion of a facility could indirectly impact farmlands by limiting or negating access to farmable land. Significant increases in noise could potentially affect livestock operations. New restrictions on adjacent lands as a result of changes in airport uses could potentially restrict agricultural practices, such as those associated with rice farming that might result in bird attraction.

### 6.3.1. Significance Determination

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for farmlands. A significant impact would occur when: *The total combined score on Form AD-1006, "Farmland Conversion Impact Rating," ranges between 200 and 260 points.*

In addition to the threshold above, Exhibit 4-1 of FAA Order 1050.1F provides additional factors to consider in evaluating the context and intensity of potential environmental impacts for farmlands. Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts.

Factors to consider that may be applicable to farmlands include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Convert important farmlands to non-agricultural uses. Important farmlands include pastureland, cropland, and forest considered to be prime, unique, or of state or local importance.

## 6.4. Mitigation

In identifying potential mitigation measures for farmlands, the FAA should coordinate with NRCS and other applicable Federal, state, or local regulatory agencies. In addition, local, state, tribal, or regional agencies may have established a mitigation program for farmland impacts, and it may be possible to provide compensation for farmland conversion through such programs.

Examples of potential measures to mitigate impacts to farmlands could include:

- adjusting the size or location of the proposed action or alternative(s) to reduce the amount of farmland taken out of production or to reduce indirect impacts on agricultural uses off-site;
- working with affected property owners and businesses to appropriately address any construction or operations-related impacts; and
- ensuring that lands temporarily taken out of agriculture are restored to a condition appropriate for agricultural use.

## 7. Hazardous Materials, Solid Waste, and Pollution Prevention

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Hazardous materials, solid waste, and pollution prevention as an impact category includes an evaluation of the following:

- Waste streams that would be generated by a project, potential for the wastes to impact environmental resources, and the impacts on waste handling and disposal facilities that would likely receive the wastes;
- Potential hazardous materials that could be used during construction and operation of a project, and applicable pollution prevention procedures;
- Potential to encounter existing hazardous materials at contaminated sites during construction, operation, and decommissioning of a project; and
- Potential to interfere with any ongoing remediation of existing contaminated sites at the proposed project site or in the immediate vicinity of a project site.

The terms *hazardous material*, *hazardous waste*, and *hazardous substance* are often used interchangeably when used informally to refer to contaminants, industrial wastes, dangerous goods, and petroleum products. Each of these terms, however, has a specific technical meaning based on the relevant regulations which are summarized in Section 7.1 below and described in more detail in Appendix B.5.

**Solid Waste** is defined by the implementing regulations of the Resource Conservation and Recovery Act (RCRA) generally as any discarded material that meets specific regulatory requirements, and can include such items as refuse and scrap metal, spent materials, chemical by-products, and sludge from industrial and municipal waste water and water treatment plants (see 40 CFR § 261.2 for the full regulatory definition).

**Hazardous waste** is a type of solid waste defined under the implementing regulations of RCRA. A hazardous waste (see 40 CFR § 261.3) is a solid waste that possesses at least one of the following four characteristics: ignitability, corrosivity, reactivity, or toxicity as defined in 40 CFR part 261 subpart C, or is listed in one of four lists in 40 CFR part 261 subpart D, which contains a list of specific types of solid waste that the U.S. Environmental Protection Agency (EPA) has deemed hazardous. RCRA imposes stringent requirements on the handling, management, and disposal of hazardous waste, especially in comparison to requirements for non-hazardous wastes.

**Hazardous substance** is a term broadly defined under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 42 U.S.C. § 9601(14)). Hazardous substances include:

- any element, compound, mixture, solution, or substance designated as hazardous under Section 102 of CERCLA;
- any hazardous substance designated under Section 311(b)(2)(A) or any toxic pollutant listed under Section 307(a) of the Clean Water Act (CWA);
- any hazardous waste under Section 3001 of RCRA;
- any hazardous air pollutant listed under Section 112 of the Clean Air Act (CAA); and
- any imminently hazardous chemical substance or mixture for which the EPA Administrator has “taken action under” Section 7 of the Toxic Substances Control Act (TSCA).

Please note that the definition of hazardous substances under CERCLA excludes petroleum products, unless specifically listed or designated there under.

**Hazardous material** is any substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The term hazardous materials includes both hazardous wastes and hazardous substances, as well as petroleum and natural gas substances and materials (see 49 CFR § 172.101).

**Pollution prevention** describes methods used to avoid, prevent, or reduce pollutant discharges or emissions through strategies such as using fewer toxic inputs, redesigning products, altering manufacturing and maintenance processes, and conserving energy.

## 7.1. Regulatory Setting

Exhibit 7-1 lists the statutes, regulations, Executive Orders (EOs), and other requirements related to hazardous materials, solid waste, and pollution prevention. See Appendix B.5 for more detail on these requirements.

**Exhibit 7-1. Statutes, Regulations, Executive Orders, and Other Requirements Related to Hazardous Materials, Solid Waste, and Pollution Prevention**

Statute, Executive Order, or Other Requirement	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Comprehensive Environmental Response, Compensation, and Liability Act (as amended by the Superfund Amendments Re-authorization Act of 1986 and the Community Environmental Response Facilitation Act of 1992)	42 U.S.C. §§ 9601-9675	40 CFR parts 300, 311, 355, 370, and 373	EPA	Establishes joint and several liability for those parties responsible for hazardous substance releases to pay cleanup costs and establishes a trust fund to finance cleanup costs in situations in which no responsible party could be identified. Enables the creation of the NPL, a list of sites with known releases or threatened releases of hazardous substances in the United States and its territories used to guide the EPA in determining which sites warrant further investigation.  As conditions of a sale, release, or transfer of Federal lands or facilities used to store hazardous materials or where a release or disposal of hazardous materials has occurred, Federal agencies must:  identify those lands or facilities; and complete waste or contaminate clean-up of these lands or facilities.
Emergency Planning and Community Right to Know Act	42 U.S.C. §§ 11001-11050	40 CFR parts 350-372	EPA	EPCRA requires hazardous chemical emergency planning by Federal, state, and local governments, Indian tribes, and industry. It also requires industry to report on the storage, use, and releases of hazardous chemicals to Federal, state, and local governments.
Federal Facilities Compliance Act	42 U.S.C. § 6961	40 CFR part 22	EPA	Waives any immunity otherwise applicable to Federal agencies for substantive or procedural requirement in connection with a Federal, state, interstate, or local solid waste or hazardous waste regulatory programs.

Statute, Executive Order, or Other Requirement	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Hazardous Materials Transportation Act <sup>1</sup>	49 U.S.C. §§ 5101-5128	49 CFR parts 100 -185	DOT	Establishes procedures, reporting requirements, and approval processes for the transport of hazardous materials by common, contract, and private carriers and by aircraft, railcar, vessel, and motor vehicle.
Oil Pollution Act	33 U.S.C. §§ 2701-2762	40 CFR parts 109-116	EPA; USCG	Requires oil storage facilities and vessels to submit to the EPA plans detailing how the facilities will respond to large oil discharges. EPA has published regulations for aboveground storage facilities; the USCG has done so for oil tankers. The Act also requires the development of Area Contingency Plans to prepare and plan for oil spill response on a regional scale.
Pollution Prevention Act	42 U.S.C. §§ 13101-13109	CEQ Memorandum on Pollution Prevention and the National Environmental Policy Act, 58 <i>Federal Register</i> 6478 (January 12, 1993)	CEQ; EPA	Requires pollution prevention and source reduction control so that wastes would have less effect on the environment while in use and after disposal. See Appendix B.5 for more information on the CEQ Memorandum on Pollution Prevention and NEPA.
Resource Conservation and Recovery Act	42 U.S.C. §§ 6901-6992k	40 CFR parts 240-299	EPA	Establishes guidelines for hazardous waste and non-hazardous solid waste management activities in the United States. Regulates the generation, storage, treatment, and disposal of waste.
Toxic Substances Control Act	15 U.S.C. §§ 2601-2697	40 CFR parts 745, 761 and 763	EPA	Provides the EPA with the authority to regulate the production, importation, use, and disposal of chemicals defined as toxic, including lead, radon, asbestos, and PCBs, that have the potential to cause unreasonable risk of injury to public health or the environment.

<sup>1</sup> <http://www.epa.gov/oem/content/lawsregs/hmtaover.htm>

Statute, Executive Order, or Other Requirement	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Executive Order 12088, Federal Compliance with Pollution Control Standards	43 <i>Federal Register</i> 47707, (October 13, 1978)	Not applicable	EPA	Directs Federal agencies to comply with applicable pollution control standards.
Executive Order 12580, Superfund Implementations amended by Executive Order , amended by EO 13016, as further amended by 13308	52 <i>Federal Register</i> 2923, (January 23, 1987)  61 <i>Federal Register</i> 45871, (August 30, 1996)  68 <i>Federal Register</i> 37691, (June 20, 2003)	Not applicable	EPA	Delegates to a number of Federal departments and agencies the authority and responsibility to implement certain provisions of CERCLA.
Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management	72 <i>Federal Register</i> 3919, (January 24, 2007)	Not applicable	OFEE; OMB	Instructs Federal agencies to conduct their respective missions in an environmentally, economically, and fiscally sound, integrated, continuously improving, efficient, and sustainable manner. Sets goals for toxic chemical reduction and waste recycling.

Statute, Executive Order, or Other Requirement	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance	74 <i>Federal Register</i> 52117, (October 5, 2009)	Not applicable	OFEE; OMB	Requires all Federal agencies to make sustainability a priority in agency operations and covers all aspects of agency operations from the construction or renovation of agency facilities to the conduct of daily business. Calls for specific management strategies to improve sustainability including minimizing the acquisition, use, and disposal of toxic and hazardous materials. It sets a target of achieving a 50 percent or higher diversion rate for non-hazardous solid waste and construction and demolition materials and debris by fiscal year 2015.
CEQ Memorandum on Pollution Prevention and the National Environmental Policy Act	Not applicable	Not applicable	Not applicable	This memorandum provides guidance to the Federal agencies on incorporating pollution prevention principles, techniques, and mechanisms into their planning and decisionmaking processes and evaluating and reporting those efforts in documents prepared pursuant to NEPA.
FAA Orders and Advisory Circulars	Not applicable	Not applicable	FAA	See Appendix B.5 for detailed description of the relevant FAA Orders and Advisory Circulars.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; EPA = U.S. Environmental Protection Agency; EPCRA = Emergency Planning and Community Right to Know Act; NPL = National Priorities List; USCG = U.S. Coast Guard; CEQ = Council on Environmental Quality; OFEE = Office of the Federal Environmental Executive; OMB = Office of Management and Budget; PCBs = polychlorinated biphenyls

### 7.1.1. Consultations, Permits, and Other Approvals

If the proposed action or alternative(s) would include the generation of hazardous waste, operators of activities that would generate hazardous waste must obtain a RCRA hazardous waste generator identification (ID) number from EPA or an authorized state (see 40 CFR § 262.12). There may also be some situations that would require RCRA hazardous waste treatment, storage, and disposal (TSD) permits. If it is clear that a RCRA generator ID number or TSD permit would be required, it should be stated in the NEPA document.

In addition, there may be additional state and local statutes and regulations that apply to the proposed action or alternative(s) (e.g., fuel storage tank operating permits). This should be determined on a case-by-case basis by contacting relevant state and local regulatory agencies in the early stages of project planning.

There are no formal required Federal consultation processes related to hazardous materials, solid waste, and pollution prevention. However, there are many Federal, state, and local agencies involved in the regulation of hazardous materials and early coordination with these agencies will aid in the collection of the necessary data during the NEPA process. In particular, the FAA should coordinate with the appropriate Federal, state, tribal, or local agencies as early as possible in the NEPA process regarding potential impacts resulting from or to previously contaminated sites. If a formal agreement between the FAA and the relevant agency is reached regarding clean-up or avoidance of a contaminated site, it should be included in the NEPA document or incorporated by reference, as appropriate. In many cases, construction activities may not commence until a formal agreement between the FAA (or applicant, as appropriate) and the relevant agency has been executed regarding the site.

When conducting the NEPA review, the FAA should also consider consultation with relevant entities regarding potential waste generation from the proposed action or alternative(s).

## 7.2. Affected Environment

When describing the study area for hazardous materials, solid waste, and pollution prevention, consider: (1) existing contaminated sites at the proposed project site or in the immediate vicinity of a project site; and (2) local disposal capacity for solid and hazardous wastes generated from the proposed action or alternative(s).

### 7.2.1. Identification of Contaminated Sites

The NEPA document should clearly identify any contaminated sites at the proposed project site or in the immediate vicinity of a project site. This includes, but is not limited to, NPL sites and sites in consideration for listing on the NPL, RCRA Solid Waste Management Units (SWMUs), and contaminated sites regulated under state cleanup laws. The identity of contaminated sites can be found through a number of resources that are listed below.

- EPA maintains several databases that track CERCLA and RCRA cleanup sites:
  - The EPA's Superfund Site Information website<sup>2</sup> at: <http://cumulis.epa.gov/supercpad/cursites/srchsites.cfm> provides Superfund site information through EPA's Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database including proposed, current, and deleted NPL sites;
  - The EPA's Cleanups in My Community website at: <http://www2.epa.gov/cleanups/cleanups-my-community> provides information on RCRA

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<sup>2</sup> In 2014, the Superfund Program implemented a new information system, the Superfund Enterprise Management System (SEMS). Efforts to migrate data to SEMS and to enhance data quality control are progressing. The Program will continue to rely on the final CERCLIS data set (dated November 12, 2013, which reflects official end of Fiscal Year 2013 Program progress) for public reporting until a complete and accurate SEMS data set is available. The current estimate for refreshing the content on this page is December 31, 2014.



Corrective Action sites, NPL sites, and some Brownfields sites for a specific geographic area; and

- o The EPA's Hazardous Waste Corrective Action website at: <http://www.epa.gov/osw/hazard/correctiveaction/index.htm> provides information about RCRA corrective action facilities.
- **United States Coast Guard (USCG)** operates the National Response Center (NRC), which is the sole Federal point of contact for reporting all hazardous substances and oil spills. In this capacity, the USCG assists and conducts hazardous spill clean-ups in the United States. The NRC maintains a database called the Emergency Response Notification System, which is a comprehensive list of all spills, and may be useful in determining if the proposed project area may be contaminated.
- **United States Geological Survey** maintains an archive of aerial photographs that may be helpful in determining past land uses.
- **State agencies** can provide help in identifying hazardous waste sites in the proposed project area and in identifying those sites with facility management plans in place (e.g., Hazardous Waste Management Plans, Emergency Response Plans, etc.). This includes state listings of state regulated hazardous waste sites (state superfund equivalent sites), identified leaking underground storage sites, and other state managed hazardous material release sites.
- **Local government agencies** can provide helpful information in determining the current and past use of a property. In some regions, installation of above ground storage tanks is required to be reported to the local fire department or building department.
- Private Vendors can provide data, information and generate radius reports of hazardous waste sites.
- Environmental Due Diligence Audits (EDDA) or other similar environmental site assessments or reports prepared for the proposed project site or other sites in the project area can provide useful information about environmental contamination. The FAA must conduct an EDDA as required and in accordance with FAA Order 1050.19, EDDA in the Conduct of FAA Real Property Transactions. In particular, the FAA must conduct a Phase I EDDA prior to the acquisition of real property. Further, in the event that serious contamination is known to exist in the project area, an EDDA or similar investigation should be conducted to determine the scope, nature, and extent of such contamination and its possible impacts on the proposed action and alternatives.
- National Priority List, RCRA Corrective Action, and some state regulated sites are required to maintain an administrative record of remediation actions and clean-up sites for public access or review, often at a nearby library. Many locations are now using only on-line administrative records. The administrative record will contain copies of key documents such as Records of Decision, Environmental Investigation Reports, Risk Assessments, and Environmental Monitoring Reports.

For each contaminated site identified, the NEPA document should include the name, location, and owner/operator of the site, the type and extent of contamination, the distance and direction of the contaminated site from the location of the proposed action or alternative(s), and the regulatory status of the contaminated site, including the assessment and clean-up activities. If the proposed action or alternative(s) would be located at a site where contamination has

occurred, the document should describe any cleanup activities that have been done in the past or any cleanup that would be done prior to or during the commencement of the proposed action or alternative(s).

### **7.2.2. Identification of Solid and Hazardous Waste Disposal Capacity**

The NEPA document should identify waste disposal facilities and capacities for the types of wastes expected to be generated from the proposed action or alternative(s).

- Hazardous waste disposal facilities – identify potential disposal sites and determine if capacity is sufficient to receive project-related wastes. The EPA’s RCRAInfo database at: <http://www.epa.gov/enviro/facts/rcrainfo/index.html> provides information about RCRA hazardous waste management facilities.
- Solid waste disposal facilities – determine the capacity of nearby disposal facilities for receiving project-associated waste and whether the proposed project would strain existing disposal facilities.

Be aware that certain TSCA regulated wastes such as PCBs may need to be disposed of at facilities specifically permitted to handle such waste. The NEPA document should identify the PCB disposal facilities and capacities for the PCB wastes expected to be generated.

## **7.3. Environmental Consequences**

After describing the affected environment for hazardous materials, solid waste, and pollution prevention, the NEPA document should:

- describe the waste that would be generated from the construction, operation and/or decommissioning of the proposed action or alternative(s), including waste generated from the disturbance of hazardous materials at an existing contaminated site.
- identify the regulatory classifications, handling, transportation, and disposal requirements for each waste stream.
- determine if waste disposal related to the proposed action or alternative(s) would result in impacts to facility disposal capacity.
- determine whether the proposed action or alternative(s) would interfere with any ongoing remediation of existing contaminated sites at the proposed project site or in the immediate vicinity of a project site.

### **7.3.1. Hazardous Materials**

The NEPA document should identify types and quantities of any hazardous materials located at the proposed project site or in the immediate vicinity of a project site or that would be used onsite as part of the implementation of the proposed action or alternative(s), including:

- If hazardous materials would be used, the NEPA document should describe how they would be stored and managed. Describe the storage and use of oil, gasoline, jet fuel, or other petroleum products. Identify hazardous materials that would be present on the site associated with construction equipment and operations.

- The NEPA document should determine if any identified contaminated sites would be impacted by the proposed action or alternative(s). If the contaminated site would affect the proposed action or alternative(s), describe that as well.
- The NEPA document should describe any special precautions needed to transport hazardous materials, if required, as part of the proposed action or alternative(s).
- The NEPA document should also provide the locations of aboveground and underground storage tanks located in the study area, if they would be used or potentially impacted by the proposed action or alternative(s). A possible source of information would be the FAA's Facility Service and Equipment Profile (FSEP) database.

### **7.3.2. Hazardous Waste**

The NEPA document should identify types and quantities of any hazardous waste that would be generated by the implementation of the proposed action or alternative(s), and describe how hazardous waste would be stored and managed. Describe any special precautions needed to transport hazardous waste, if required, as part of the proposed action or alternative(s). Identify any on-site treatment, engineering, or administrative controls that may be applied to the hazardous waste encountered.

### **7.3.3. Solid Waste**

The NEPA document should identify types and quantities of any solid waste that would be generated by the implementation of the proposed action or alternative(s), and describe how the solid waste would be stored, managed, and disposed.

### **7.3.4. Pollution Prevention**

The NEPA document should describe any pollution prevention activities, plans, programs, or policies currently being undertaken or in effect that may be relevant to the proposed action or alternative(s), including:

- how pollution prevention plans or programs associated with the proposed action or alternative(s) would avoid, prevent, or reduce pollutant discharges or emissions.
- aspects of construction, operation, and decommissioning of the proposed action or alternative(s) that should be addressed in pollution prevention programs.
- aspects of operations and waste generation from the proposed action or alternative(s) that could result in accidental discharges with the potential to cause negative impacts to the environment.
- appropriate pollution prevention planning measures to address accidental discharges.
- methods to be employed to control spills and any other unauthorized releases during implementation of the proposed action or alternative(s).

### **7.3.5. Significance Determination**

The FAA has not established a significance threshold for hazardous materials, solid waste, or pollution prevention in FAA Order 1050.1F; however, the FAA has identified factors to consider in evaluating the context and intensity of potential environmental impacts for hazardous

materials, solid waste, or pollution prevention (see Exhibit 4-1 of FAA Order 1050.1F). Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to hazardous materials, solid waste, and pollution prevention include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Violate applicable Federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management;
- Involve a contaminated site (including, but not limited to, a site listed on the NPL). Contaminated sites may encompass relatively large areas. However, not all of the grounds within the boundaries of a contaminated site are contaminated, which leaves space for siting a facility on non-contaminated land within the boundaries of a contaminated site. An Environmental Impact Statement (EIS) is not necessarily required. Paragraph 6-2.3.a of FAA Order 1050.1F allows for mitigating impacts below significant levels (e.g., modifying an action to site it on non-contaminated grounds within a contaminated site). Therefore, if appropriately mitigated, actions within the boundaries of a contaminated site would not have significant impacts;
- Produce an appreciably different quantity or type of hazardous waste;
- Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or
- Adversely affect human health and the environment.

## 7.4. Mitigation

Some examples of potential measures to mitigate impacts related to hazardous materials, solid waste, and pollution include:

- mitigation or monitoring requirements applicable to prior or ongoing cleanup activities, such as at an NPL site;
- implementing any on-site treatment, engineering, or administrative controls that may be applied to reduce the hazards posed by wastes encountered;
- developing a hazardous materials response plan and/or a spill prevention, control, and countermeasure plan to identify those precautions, training requirements, and response measures that would be taken to prevent and contain releases of hazardous materials;
- employing source reduction strategies such as recovering, recycling, or composting waste materials;
- finding markets for recovered, recycled, or composted products, or other wastes that are usable for producing energy or other activities;
- recycling of construction debris associated with the action;
- development and incorporation of an Environmental Management System; and
- incorporating recommendations provided by Federal, state, tribal, or local agencies responsible for managing any known contaminated sites.

## **8. Historical, Architectural, Archeological, and Cultural Resources**

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Historical, architectural, archeological, and cultural resources encompass a range of sites, properties, and physical resources relating to human activities, society, and cultural institutions. Such resources include past and present expressions of human culture and history in the physical environment, such as prehistoric and historic archaeological sites, structures, objects, districts, which are considered important to a culture or community. Historical, architectural, archeological, and cultural resources also include aspects of the physical environment, namely natural features and biota, that are a part of traditional ways of life and practices and are associated with community values and institutions.

## 8.1. Regulatory Setting

Exhibit 8-1 lists the primary statutes, regulations, Executive Orders (EOs), and other requirements related to historical, architectural, archeological, and cultural resources. See Appendix B.6 for more detail on these requirements.

**Exhibit 8-1. Statutes, Regulations, Executive Orders, and Other Requirements Related to Historical, Architectural, Archeological, and Cultural Resources**

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
American Indian Religious Freedom Act	42 U.S.C. § 1996	43 CFR § 7.7 43 CFR § 7.32 25 CFR § 262.7	Not applicable	Requires consultation with Native American groups concerning actions on sacred sites or affecting access to sacred sites. Requires Federal agencies to consider the impacts of their actions on religious sites and objects that are important to Native Americans, including Alaska Natives and Native Hawaiians, regardless of the eligibility for the NRHP.
Antiquities Act of 1906	54 U.S.C. §§ 320301-320303	43 CFR part 3	DOI; NPS	Authorizes the President to declare areas of public lands as national monuments and to reserve or accept private lands for that purpose.

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Archeological and Historic Preservation Act	54 U.S.C. §§ 312501-312508	36 CFR part 68 36 CFR part 79 Guidelines for Archeology and Historic Preservation: Standards and Guidelines, 48 <i>Federal Register</i> 44716, (September 29, 1983)	NPS; Departmental Consulting Archeologist and Archeological Assistance Program	Provides for the preservation of historical and archeological data which might otherwise be destroyed or irreparably lost due to a Federal action, Federally-licensed action, or Federally-funded action. DOI's Standards and Guidelines for Archeology and Historic Preservation (see 36 CFR part 68) advise Federal agencies on implementation of this law.
Archaeological Resources Protection Act	16 U.S.C. §§ 470aa – 470mm	43 CFR part 7 36 CFR part 79 25 CFR part 262	NPS; Departmental Consulting Archeologist and Federal Archaeology Program	Prohibits unauthorized excavation of archaeological resources on Federal or Indian lands, and establishes standards for permissible excavation by permit (see Section 8.2.2 below). Requires Federal agencies to identify archaeological sites on Federal lands.
Department of Transportation Act, Section 4(f)	49 U.S.C. § 303	23 CFR part 774	DOT	See Chapter 5 of this Desk Reference for a discussion of Section 4(f) of the DOT Act.
Historic Sites Act of 1935	16 U.S.C. §§ 461 – 467	36 CFR part 65	DOI, NPS	Declares as national policy the preservation for public use of historic sites, buildings, objects, and properties of national significance. Provides the basis for the National Historic Landmarks program for designating properties having exceptional value in commemorating or illustrating the history of the United States.

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
National Historic Preservation Act	54 U.S.C. §§ 300101 et seq	36 CFR part 800 (Section 106 process); 36 CFR part 60 (NRHP); 36 CFR part (state and local preservation programs); 36 CFR part 62.1 (National Natural Landmarks); 36 CFR part 65 (National Historic Landmarks); 36 CFR part 68 (standards); 36 CFR part 73 (World Heritage Program); 36 CFR part 78 (waiver of Federal agency section 110 responsibilities); 36 CFR part 79 (curation)	NPS; ACHP; SHPO; THPO	Establishes the ACHP, an independent agency, and the NRHP within the NPS. Section 106 of the NHPA requires Federal agencies to consider the effects of their undertaking (or action) on properties listed on or eligible for listing on the NRHP. Section 110 of the NHPA governs Federal agencies' responsibilities to preserve and use historic buildings; designate an agency Federal Preservation Officer; and identify, evaluate, and nominate eligible properties under the control or jurisdiction of the agency to the NRHP. Section 112 of the NHPA addresses professional standards. Section 314 discusses confidentiality requirements that may apply to an undertaking.
Native American Graves Protection and Repatriation Act	25 U.S.C. §§ 3001-3013	43 CFR part 10 25 CFR § 262.8	NPS; NAGPRA Review Committee	Addresses the disposition of certain Native American cultural items, including human remains, by a Federally-funded repository, and governs the inadvertent discovery of Native American cultural items on Federal and tribal lands.
Public Building Cooperative Use Act	40 U.S.C. §§ 601a, 601a1, 606, 611c, and 612a4	41 CFR parts 101-117	GSA	Encourages the acquisition and use of space in suitable buildings of historic, architectural, or cultural significance.
Executive Order 11593, Protection and Enhancement of the Cultural Environment	36 <i>Federal Register</i> 8921, (May 13, 1971)	Not applicable	ACHP	Requires that Federal plans and programs contribute to the preservation and enhancement of sites, structures, and objects of historic, architectural, or archaeological significance.
Executive Order 13006, Locating Federal Facilities on Historic Properties in Our Nation's Central Cities	61 <i>Federal Register</i> 26071, (May 24, 1996)	Not applicable	ACHP	Requires Federal agencies, when operationally appropriate and economically prudent, to use and maintain historic properties and districts, especially those located in central business areas, and to give first consideration when locating



Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
				Federal facilities to historic properties within historic districts, then developed or undeveloped sites within historic districts, and lastly to historic properties outside of historic districts.
Executive Order 13007, Indian Sacred Sites	61 <i>Federal Register</i> 26771, (May 29, 1996)	Not applicable	Assistant to the President for Domestic Policy	Requires Federal agencies to consult on a government-to-government basis with tribes if the proposed project involves an Indian Sacred Site.
Executive Order 13175, consultation and Coordination with Indian Tribal Governments	65 <i>Federal Register</i> 67249, (November 9, 2000)	Not applicable	Not applicable	Requires Federal agencies to have an accountable tribal consultation process that ensures timely and meaningful input from Native American tribes on the development of Federal policies that have tribal implications. Directs executive departments and agencies to engage in government-to-government relations with Native American tribal governments in a knowledgeable, sensitive manner.
Executive Memorandum, Government-to-Government Relations with Native American Tribal Governments (April 29, 1994)  Executive Memorandum on Tribal Consultation (Nov. 5, 2009)	65 <i>Federal Register</i> 67249, (November 9, 2000)	Not applicable	Not applicable	Directs executive departments and agencies to develop a detailed plan of action to implement Executive Order 13175.

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
DOT Order 5650.1, <i>Protection and Enhancement of the Cultural Environment</i> , November 20, 1972	Not applicable	Not applicable	DOT	Requires that Federal plans and programs contribute to the preservation and enhancement of sites, structures, and objects of historic, architectural, or archaeological significance.

<sup>a</sup> NRHP = National Register of Historic Places; DOI = U.S. Department of the Interior; NPS = National Park Service; ACHP = Advisory Council on Historic Preservation; SHPO = State Historic Preservation Officer; THPO = Tribal Historic Preservation Officer; NHPA = National Historic Preservation Act; NAGPRA = Native American Graves Protection and Repatriation Act; GSA = Government Services Administration

### 8.1.1. NEPA and Section 106 of the NHPA

This chapter describes the analysis of historical, architectural, archeological, and cultural resources within the context of NEPA review. Since Section 106 of the NHPA is the principal statute concerning such resources, this chapter is primarily focused on the Section 106 process and its interaction with NEPA review. However, it is important to evaluate proposed projects in the context of the other applicable cultural resources laws summarized in Exhibit 8-1 and Appendix B.6.

The Section 106 implementing regulations use the term *undertaking* to mean a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval (see 36 CFR § 800.16(y)). This term is analogous to a proposed Federal action, as used in the NEPA context.

NEPA and the NHPA are two individual statutes, with separate sets of implementing regulations. Under NEPA, the FAA is responsible for analyzing the impacts of its action on historical, architectural, archeological, and cultural resources as part of a broader review of the human environment. A proposed action or alternative(s) with the potential to affect historic properties is subject to Section 106 review regardless of whether the action is eligible for a Categorical Exclusion (CATEX) under NEPA. Section 106 of the NHPA focuses on a specific subset of historical, architectural, archeological, and cultural resources: those properties that are listed on or meet the eligibility criteria for the NRHP (discussed further in Section 8.2.3.1). Under Section 106, an agency is responsible for taking into account the effects of undertakings on historic properties and affording the ACHP the opportunity to comment on such undertakings (see 36 CFR § 800.1(a)). Although NEPA and Section 106 are distinct and contain separate requirements, they both require scoping, consultations, and public involvement; therefore, coordinating efforts under NEPA and Section 106 can make both reviews more efficient.

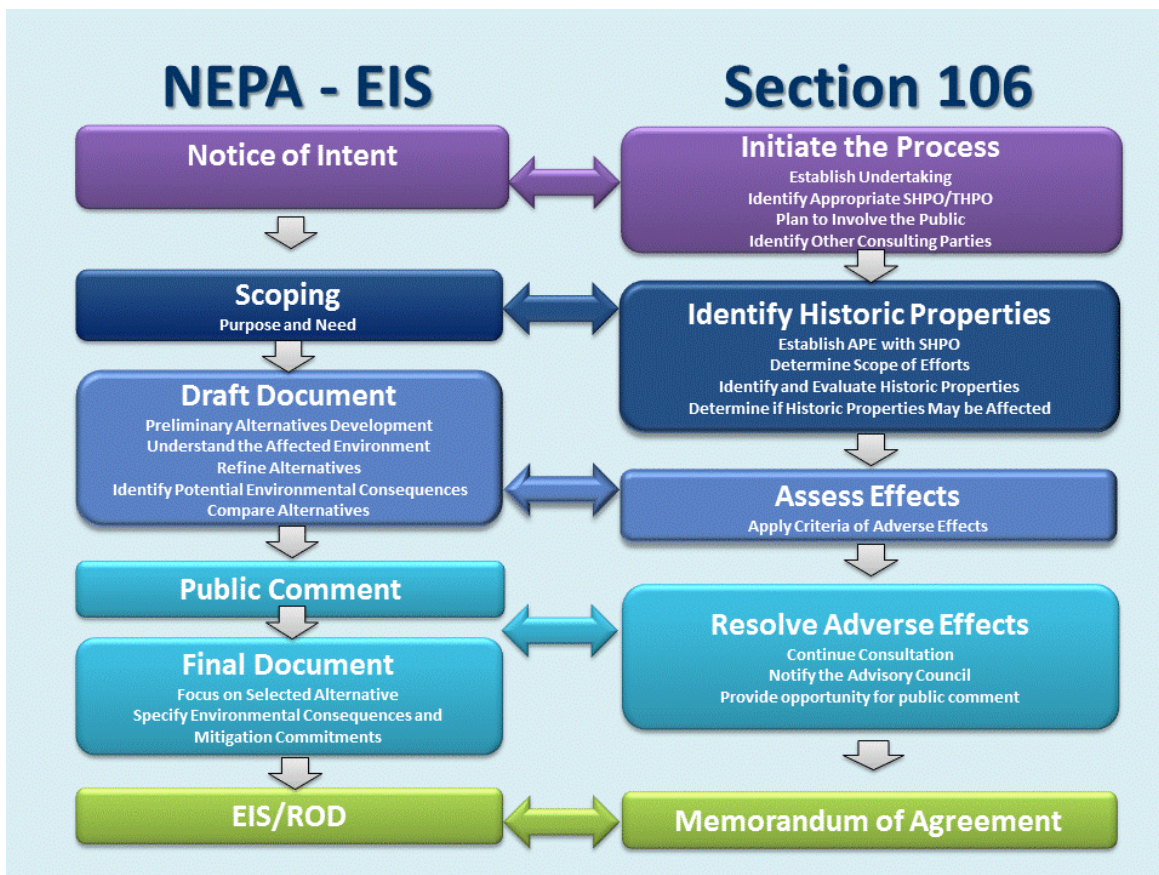
A Section 106 review must be completed prior to making a CATEX determination, signing a Finding of No Significant Impact (FONSI), or issuing a Record of Decision (ROD). Undertakings that have an adverse effect on cultural resources under Section 106 of the NHPA and may have a significant effect on such resources under NEPA may constitute an extraordinary circumstance requiring an Environmental Assessment (EA) or an Environmental Impact Statement (EIS), even if a project normally qualifies for a CATEX under NEPA. Typically, conducting the Section 106 process, as set forth in 36 CFR part 800 and described below, is an effective way to gather the information needed to assess impacts on historical, architectural, archeological and cultural resources for NEPA review. The NEPA document will report applicable Section 106 consultation and findings and apply those findings to the NEPA significance determination.

If the undertaking is a type of activity that does not have the potential to cause effects on historic properties, assuming such historic properties are present, the FAA has no further obligations under Section 106 (see 36 CFR § 800.3(a)(1)), and no further analysis is needed in the NEPA document.

The timing of the Section 106 process relative to NEPA will depend on the level of environmental review. Exhibit 8-2 illustrates how the Section 106 consultation process can be coordinated with the NEPA process for an EIS. Further information on the coordination of the Section 106 process and NEPA for CATEXs and EAs is provided in *NEPA and NHPA, A Handbook for Integrating NEPA and Section 106* (March 2013)<sup>1</sup> issued jointly by Council on Environmental Quality (CEQ) and the ACHP.

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<sup>1</sup> [http://www.achp.gov/docs/NEPA\\_NHPA\\_Section\\_106\\_Handbook\\_Mar2013.pdf](http://www.achp.gov/docs/NEPA_NHPA_Section_106_Handbook_Mar2013.pdf)

**Exhibit 8-2. Coordination of the EIS Process with Section 106 of the NHPA<sup>a</sup>**

<sup>a</sup> If the FAA has executed a Memorandum of Agreement (MOA) with other signatories before it circulates the draft EIS for comment, the draft EIS should include the MOA. In all cases, an executed MOA must be included in the final EIS, unless extenuating circumstances prohibit this. EIS = Environmental Impact State; ROD = Record of Decision

### 8.1.1.1. Roles and Responsibilities under Section 106 of the NHPA

**Federal Agency** – The FAA is responsible for fulfilling the requirements of Section 106. The responsible FAA official is also the *agency official* (see 36 CFR § 800.2(a)) for Section 106 coordination. The FAA must engage in government-to-government consultation when consultation with Federally recognized Indian tribes is required. The FAA can negotiate and incorporate mitigation measures where a project could result in adverse effects to historic properties and must be a signatory to any legal agreements (such as a Programmatic Agreement (PA) or MOA)) carried forth as part of the consultation.

**Federal Preservation Officer** – The Federal Preservation Officer (FPO) is a qualified official designated by each agency who is responsible for coordinating the agency’s activities under the NHPA. FAA’s FPO is located within the Office of Environment and Energy’s Environmental Policy and Operations Division (AEE-400). FAA’s FPO serves as the agency’s primary liaison with the ACHP and provides national program oversight, while the agency officials are responsible for carrying out Section 106 compliance on individual projects.

**Applicant** – The applicant is considered a Section 106 consulting party, and may also be delegated the responsibility to undertake certain aspects of Section 106 consultation (see 36 CFR § 800.2(c)(4)), primarily the collection of information for the identification of historic properties. The applicant may have specific responsibilities under a legal agreement, such as a MOA, if consultation includes the mitigation of adverse effects to historic properties.

**State Historic Preservation Officer** – In accordance with Section 101(b)(3) of the NHPA, the State Historic Preservation Officer (SHPO) has a specific consultative function in the Section 106 process and advises and assists Federal agencies in carrying out their Section 106 responsibilities. The SHPO reflects the interests of the state and its citizens, and is a technical advisor in the consultation process to help ensure that historic properties are taken into consideration throughout an undertaking's planning and development. SHPO responsibilities include participating in consultation and reviewing an agency's documentation and effect finding.

**Indian Tribes, Alaskan Native Villages, and Native Hawaiian organizations** – Indian tribes, Alaskan Native Villages, and Native Hawaiian organizations may participate in consultation as consulting parties, as they may have a unique interest in an undertaking based on their ancestral homelands or current geographic affiliations. Consultation may include commenting on the effects of an undertaking, providing information on present or potentially affected sites, or consulting on properties of unique tribal significance.

**Tribal Historic Preservation Officer** – A Tribal Historic Preservation Officer (THPO) assumes some or all of the functions of a SHPO on tribal lands. A THPO is officially designated by a Federally-recognized Indian tribe pursuant to Section 101(d)(2) of the NHPA to direct a tribal cultural resources program approved by the National Park Service (NPS). If an undertaking is occurring on tribal lands where a THPO has been designated, the FAA must consult with the THPO in lieu of the SHPO (however, the SHPO, under certain circumstances, may still be considered a consulting party). Please note that while the THPO may be a primary point of contact and technical advisor during consultation regarding resources on tribal lands, other tribes may also be consulting parties and afforded government-to-government consultation status. If all or part of the undertaking is on tribal land where the tribe does not have a designated THPO, the FAA must consult with that tribe about undertakings on or affecting its lands on the same basis as it would with a THPO, in addition to the SHPO. If an undertaking's area of potential effects (APE) is located outside tribal lands but includes historic resources of religious and cultural significance to a tribe, the THPO does not assume the responsibilities of the SHPO, but may serve as the official representative designated by the tribe to represent its interests as a consulting party under Section 106.

**Advisory Council on Historic Preservation** – The ACHP is an independent Federal agency that oversees Federal historic preservation and tribal programs. The ACHP issues regulations to implement Section 106; provides guidance and advice on the application of the regulations; and generally oversees the operation of the Section 106 process. The ACHP must be afforded the opportunity to comment on Federal undertakings subject to Section 106. The ACHP, however, typically reserves its comments either for complex consultations in which it has had previous involvement or for consultations wherein a Federal agency seeks ACHP comment on unresolved consultation issues. In the event an undertaking is particularly complex or large in scope, or if there are disagreements between parties, the ACHP can be invited to participate in the process

(see 36 CFR § 800.2(b)(1)). The ACHP must be informed of adverse effects to historic properties and may participate directly in consultation to mitigate adverse effects.

**Other Consulting Parties** – Other entities that may have a consultative role in Section 106 review include representatives of local governments, organizations with a demonstrated interest in the undertaking (e.g. local historical societies, a local museum, a club or non-profit with interest in a project area, or other Federal or state agencies with an interest in a project), and the public. Parties that express an interest in the undertaking may provide comments or express opinions on the effects of the undertaking on historic properties.

**Cultural Resources Contractor** – A Cultural Resources contractor is a contractor that meets the Secretary of Interior’s Professional Qualifications Standards at 36 CFR part 61. Cultural Resources contractors may be employed to conduct identification efforts, including cultural resources surveys, and provide professional and technical advice and recommendations on the identification of and effects to historic properties. A contractor may consult with certain consulting parties. The contractor, however, should do so only under the instruction of the FAA or applicant, as applicable. The contractor should not undertake tribal consultation, except under specific direction by the responsible FAA official.

### **8.1.2. Section 106 and Department of Transportation Act, Section 4(f)**

Historic sites on or eligible for inclusion on the NRHP are also protected under the Department of Transportation (DOT) Act, Section 4(f). Analyses and findings made in accordance with Section 106 also support DOT Section 4(f) determinations. Findings of no historic properties present or affected, or no historic properties adversely affected, under Section 106 support determinations of no use (either constructive or physical) under Section 4(f) of the DOT Act. Findings of adverse effects do not automatically trigger Section 4(f); however, if there is a physical taking of the property, or adverse effects that substantially impair the affected resource’s historical integrity, there may be a “use” under Section 4(f). Refer to Chapter 5 of this Desk Reference for a discussion of Section 4(f).

### **8.1.3. Consultations, Permits, and Other Approvals**

Consultation should be initiated early in the planning process. Beyond the public participation requirements of NEPA, there are specific Section 106 consultation procedures that must be followed, as outlined in 36 CFR §§ 800.2-800.6. These include consultation on the APE, on identification of historic properties, on determinations of effect, and on resolution of adverse effects (described below). Those consultations should be discussed in the NEPA document as a function of Section 106 compliance.

The regulations implementing Section 106 require the FAA to consult with certain parties, such as the SHPO and THPO; require the FAA to invite other parties to participate in consultation, such as representatives of local governments, the applicant, and any Indian tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the APE; and gives the FAA discretion to invite additional parties to consult, such as individuals and organizations with a demonstrated interest in the undertaking (see 36 CFR § 800.2(c)). The FAA should plan consultations appropriate to the scale of the proposed action or alternative(s). The NEPA scoping process can assist in identifying appropriate stakeholders to invite as consulting parties under Section 106. The FAA must consider all written requests of

individuals and organizations to participate in consultation and, after consulting with the SHPO/THPO, determine if the requester should be given consulting party status.

Section 106 contains specific consultation requirements and often requires separate meetings among consulting parties and concurrence letters from the SHPO. When coordinating the two processes, notification of any public meetings, hearings, or listening sessions for a NEPA document should explicitly state that Section 106 will also be addressed. NEPA scoping alone will not fulfill all the consultation requirements of a Section 106 review. There are also some unique considerations for consultation with Indian tribes, including the government-to-government protocols.

Exhibit 8-3 provides a basic framework of required documents needed for basic consultation; however, consultation may include additional correspondence and/or steps. The FAA may expedite consultation by combining multiple steps if the SHPO/THPO agrees and consulting parties and the public have an adequate opportunity to express their views.

### Exhibit 8-3. Section 106 Consultation Framework

Framework
Section 106 initiation letter to appropriate SHPO/THPO, tribes, and any other parties identified as potential consulting parties.
Section 106 initiation letter following government-to-government protocols to any tribes or Native Hawaiian organizations that might attach religious and cultural significance to historic properties in the APE.
APE letter and documentation to SHPO/THPO and consulting parties.
Results of Identification Efforts and a proposed Effect Determination letter to SHPO/THPO and consulting parties. Include copies of technical reports.
<b>When Applicable</b> , notice to the ACHP, consulting parties, and the public of an <i>Adverse Effect</i> determination with requisite documentation.

In addition, Section 8.9 provides a series of sample letters that can assist with the Section 106 process.

#### 8.1.3.1. Consultation with Indian Tribes, Alaskan Native Villages, and Native Hawaiian Organizations

For a specific project, the FAA must make a reasonable and good faith effort to identify Indian tribes and Native Hawaiian organizations that might attach religious and cultural significance to a resource that may be affected by the undertaking and invite them to be consulting parties to assist in the identification of resources in the study area. This commonly requires contacting the SHPO for suggestions about which tribes might have an interest in the undertaking and then contacting the identified tribes by letter.

Federally-recognized Indian tribes are independent sovereign nations with their own cultures and government processes. The FAA has a legal responsibility to engage interested Federally-recognized tribes in government-to-government consultation (see 36 CFR § 800.2(c)(2)(ii)(C)). Government-to-government consultation with Federally-recognized tribes is distinct from and

has different requirements than general Section 106 consultation set forth under 36 CFR § 800.2(a)(4). Initial contact with tribes should be addressed to the tribal leadership and should come from an agency official with a respectfully senior position (e.g., management level). These communication protocols should be observed until the tribe delegates project responsibilities to staff. Specific policies on engaging in government-to-government tribal consultation can be found in FAA Order 1210.20, *American Indian and Alaska Native Tribal Consultation Policy and Procedures*. Even when aspects of the Section 106 process are delegated, for example, in the State Block Grant program, it is still the responsibility of the FAA to conduct government-to-government consultation. A ‘one-size-fits-all’ approach to tribal consultation may not be effective. It is important to listen to tribal concerns and respond accordingly.

Non-federally recognized tribes may also be important participants in Section 106 consultation as interested parties. Non-federally recognized tribes that have a demonstrated interest in the undertaking should be invited to participate in consultation.

Additional resources for tribal consultation can be found in the provisions in Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, 65 *Federal Register* 67249, (November 9, 2000), and the Executive Memorandum, *Government-to-Government Relations with Native American Tribal Governments* (April 29, 1994). The FAA is required, in formulating policies significantly or uniquely affecting tribes, to be guided, to the extent permitted by law, by principles of respect for tribal self-government and sovereignty, for tribal treaty and other rights, and for responsibilities that arise from the unique legal relationship between the Federal government and tribes. The ACHP has prepared a guidance document about tribal consultation, *Consultation with Indian Tribes in the Section 106 Process: A Handbook* (see the ACHP’s website at: <http://www.achp.gov/>).

## **8.2. Affected Environment**

The affected environment section of the NEPA document will discuss historic, architectural, archeological, and cultural resources in the study area that may be affected by the proposed action or alternative(s). This section outlines specific details of the Section 106 process, including how to define the APE under study and the scope of resources within that area. The general steps in the process involve: 1) establishing the APE; 2) identifying any resources in the area; and 3) determining whether the resources are included or eligible for inclusion on the NRHP or protected under other related statutes (e.g., the Native American Graves Protection and Repatriation Act (NAGPRA); see Exhibit 8-1).

### **8.2.1. The Area of Potential Effects**

It is the FAA’s responsibility to define the (APE in consultation with the SHPO/THPO (see 36 CFR § 800.4(a)). The APE is “the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking” (see 36 CFR § 800.16(d)). The APE must include all direct and reasonably foreseeable indirect effects, but does not have to be one contiguous area.

An APE should be based on a thorough understanding of the undertaking and the extent of its potential impacts, including any proposed construction and potential ongoing operations that will be introduced into the environment. Each alternative proposed in the NEPA document should be



considered concurrently under Section 106. The APE, therefore, should encompass all alternatives under consideration.

Some effects to consider when defining the APE include:

- operational effects including noise, vibration, lighting, and increased traffic; and
- ground effects including ground-disturbing activities, staging and construction areas, and construction of access roads.

The FAA must consult with the SHPO/THPO on the definition of the APE and should seek the SHPO/THPO's concurrence. SHPO/THPO concurrence on the APE can be secured either before or after resource identification. It is advisable to secure written concurrence prior to investing in extensive resource identification efforts.

### **8.2.2. Identification of Historical, Architectural, Archeological, and Cultural Resources in the Area of Potential Effects**

The FAA, in consultation with consulting parties, must identify historic properties that are either on, or eligible for listing on, the NRHP as set forth in 36 CFR § 800.4(b). Not all resources are known, and the FAA is expected to make a good faith effort to carry out appropriate identification efforts, which may include background research, consultation, oral history interviews, and field surveys. Identification efforts can vary greatly depending on the scope of the undertaking and its potential effects. The scope of the undertaking may also help in deciding whether a Cultural Resources contractor is necessary to assist in properly identifying, documenting, and evaluating historic properties and other cultural resources.

Resources to assist in such identification efforts include:

- **The NRHP database** at: <http://www.nps.gov/nr/research/> ;
- **The SHPO/THPO.** Contact information for SHPOs can be found at: <http://www.nps.gov/nr/shpolist.htm>. Contact information for THPOs can be found at: <http://www.nathpo.org/map.html>. Most SHPOs maintain databases or archives of previous surveys and previously identified cultural resources. THPOs also may maintain records of previously identified cultural resources. Look on the SHPO/THPO website or contact the SHPO/THPO to see how to access this information. Also consult state registries maintained by the SHPO.
- **Consulting Indian tribes and Native Hawaiian organizations.** Indian tribes and Native Hawaiian organizations can provide information on sites and properties to which they attach religious and cultural importance. This information may not be available in SHPO-maintained archives, databases, or registries.
- **Local museums, historical societies, and special interest organizations** may also provide information about historic properties or sites in the APE.

Background research and consultation may conclude that additional research or field survey is necessary to identify the presence of resources. Hiring a Cultural Resources contractor may be advisable for a large project in an area that is sensitive in terms of historical or archaeological resources and when there is a potential to affect these resources. Most SHPO offices can provide lists of qualified Cultural Resources contractors.

If field investigations are necessary and the undertaking includes Federally-managed land or tribal land, all identification efforts should be conducted in consultation with the appropriate agency or tribe. Agencies and tribes may have particular guidance and/or requirements for identification and survey on their land.

Archeological resources may be listed or eligible for listing on the NRHP. The level of identification effort should include archeological field testing and should confirm whether a Federal or state permit is required. Federal regulations regarding protection of archaeological resources are set forth in 43 CFR part 7, and a permit is required for any person proposing to excavate or remove archaeological resources from public lands or Indian lands. To carry out activities associated with excavation or removal, the person must apply to the Federal land manager for a permit for the proposed work and cannot begin the proposed work until a permit has been issued. See 43 CFR §§ 7.5-7.12 for information on permits. Please note that any human remains, funerary objects, sacred objects, and objects of cultural patrimony found on Federal or tribal land are subject to NAGPRA. States may have their own permit processes for surveys, excavations, or other related activities.

Additional information may be obtained from the FAA's FPO in AEE.

### **8.2.3. Types of Historical, Architectural, Archeological, and Cultural Resources and Eligibility**

Not all cultural resources identified in the APE may necessarily be considered culturally or historically important. Section 106 prescribes that an agency consider effects to *historic properties*, defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the NRHP (see 36 CFR § 800.16(1)(1)). The eligibility of resources is determined through the use of the NRHP criteria for evaluation of historic resources and through Section 106 consultation.

It is the FAA's responsibility to make a determination of resource eligibility. A Cultural Resources contractor, when involved in resource identification and evaluation efforts, will generally provide recommendations on the potential eligibility of resources.

#### **8.2.3.1. Historic Properties (including Archeological Sites)**

Historic properties are resources listed on the NRHP, or determined eligible for listing on the NRHP. The NRHP is the official Federal list of historic properties which have been found to meet criteria of significance and integrity stated in 36 CFR § 60.4. Not all historic properties have been nominated to the NRHP, but if a property is eligible for listing, it is afforded the same status under Section 106 as listed properties. A district, site, building, structure, or object that possesses integrity of location, design, setting, materials, workmanship, feelings, and association can be considered eligible for inclusion in the NRHP if it meets one or more of the following criteria presented in Exhibit 8-4:

**Exhibit 8-4. National Register of Historic Places Eligibility Criteria**

Criterion A	The property is associated with events that have made a significant contribution to the broad patterns of our history;
Criterion B	Is associated with the lives of persons significant in our past;
Criterion C	Embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction; or
Criterion D	Yields, or may be likely to yield, information important in prehistory or history.

Guidance on how to apply the criteria can be found in NPS's National Register Bulletin, *How to Apply the National Register Criteria for Evaluation* at: <http://www.nps.gov/nr/publications/bulletins/nrb15/>.

A thorough determination of eligibility requires a historic context, an assessment of a property's integrity, and an evaluation of significance. (Note: An evaluation that a historic property is significant for Section 106 purposes is different from a NEPA determination of significant impact). A Cultural Resources contractor can assist in gathering the information for eligibility determinations and providing recommendations on the eligibility of historic properties.

The FAA, in consultation with the SHPO/THPO, evaluates a property's eligibility for inclusion on the NRHP (see 36 CFR § 800.4(c)). In some cases determinations of eligibility can be combined with determinations of effect (described below) and submitted together to the SHPO. In most cases, the FAA should be able to reach agreement with the SHPO/THPO on a property's eligibility, and no further evaluation will be necessary. If the FAA and the SHPO/THPO disagree about eligibility, the FAA must obtain a determination of eligibility (DOE) from the Keeper of the NRHP, (see 36 CFR § 800.4(c)(2) and 36 CFR part 63).<sup>2</sup> The Keeper will make the final eligibility determination.

**8.2.3.2. Traditional Cultural Properties**

A unique type of cultural resource that can be eligible for listing on the NRHP is called a *traditional cultural property* (TCP). A TCP is generally defined as a property that is eligible for the NRHP because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. (See criteria in 36 CFR § 60.4). When evaluating TCPs, it is important to note that significance derives from past and continuous use of the site for specific cultural practices.

TCPs are typically identified through consultation with tribes or other consulting parties that have cultural affiliation with the APE. Guidance on evaluating TCPs can be found in the NPS bulletin *Guidelines for Evaluating and Documenting Traditional Cultural Properties* at: <http://www.nps.gov/nr/publications/bulletins/nrb38/>. If determined eligible for the NRHP, TCPs

<sup>2</sup> The Keeper is the individual who has been delegated the authority by the Secretary of the Interior to list properties and determine their eligibility for the National Register of Historic Place (NRHP). The Keeper may further delegate this authority as he or she deems appropriate (see 36 CFR § 60.3).

are treated like historic properties for the purposes of evaluating impacts under Section 106 and NEPA.

### **8.2.3.3. Native American Sacred Sites**

Sacred sites are places of significant spiritual value for Native Americans and are integral to the practice of Native American religions. Sacred sites are considered significant cultural resources and are also protected under the American Indian Religious Freedom Act (AIRFA). AIRFA requires Federal agencies to consider the impacts of their actions on religious sites and objects that are important to Native Americans, including Alaska Natives and Native Hawaiians, regardless of the eligibility for the NRHP. Religious and sacred sites are typically identified through consultation with tribes.

### **8.2.3.4. Other Properties Afforded Consideration**

*National Historic Landmarks* – National Historic Landmarks (NHLs) are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States. NHLs are automatically listed in the NRHP. Section 110(f) of the NHPA requires the FAA to undertake such planning and actions as may be necessary to minimize harm to NHLs that may be adversely affected by an undertaking. If an NHL is identified in the APE, assess impacts to the NHL per Section 8.3.1 of this Desk Reference and, if applicable, follow the procedures in 36 CFR § 800.10.

*Protected Tribal Resources* – Protected Tribal Resources are those natural resources, properties, sites, and items of traditional or customary religious or cultural importance, either on or off Indian lands, retained by, or reserved by or for, tribes through treaties, statutes, judicial decisions, or Executive Orders, including tribal trust resources. For example, subsistence resources protected under the Alaska National Interest Lands Conservation Act (Public Law 96-487) are protected tribal resources.

*Properties Protected by Local and State Laws* – Some states may afford special protection to certain cultural resources (i.e., laws related to identified burial sites), or to those sites listed on state and/or local historic registries. Consult state statutes or the SHPO to determine if certain state laws apply to an undertaking.

## **8.2.4. Documenting the Affected Environment in a NEPA Document**

The affected environment section in the NEPA document should describe the APE's physical boundaries, briefly summarize the historical and environmental context, and describe identified historical, architectural, archeological, and cultural resources. If there are numerous cultural resources present in the APE, consider listing them in a table for clarity (see Exhibit 8-5).

Technical reports can be appended to the NEPA document, but these reports may be lengthy or contain sensitive data and it may be more effective to incorporate the information by reference. The level of description should be commensurate with the anticipated level of impact. Before appending any technical reports, the FAA should consider whether they contain confidential or sensitive information (36 CFR § 800.11(c)).

**Exhibit 8-5. Cultural Resources Identified in the APE (Example)**

<b>Resource #</b>	<b>Description</b>	<b>Land Ownership Status</b>	<b>NRHP Eligibility Determination</b>	<b>Project Area Location <sup>a</sup></b>
LA 001	2.2 acres; artifact scatter; Early Archaic Period	State	Eligible	Access road
LA 002	12 acres; artifact scatter; Paleo-Indian Period	State, Private	Undetermined	Utility corridor

<sup>a</sup>The FAA has a responsibility under Section 304 of the NHPA to acknowledge the sensitive nature of some cultural resources and keep geographic information confidential when disclosure may cause significant invasion of privacy, risk harm to the resource, or impede the use of a traditional religious site by practitioners. In most cases, the NEPA document should not present the location of historic properties on a map because of concerns with intentional disturbance or theft of the properties.

## 8.3. Environmental Consequences

### 8.3.1. Determining Potential Impacts

After describing the affected environment for historical, architectural, archaeological, and cultural resources, the consequences of the proposed action or alternative(s) on those resources should be evaluated. The following discussion outlines the Section 106 process for assessing the effects an undertaking would have on historic properties. The determination of effects must be reported in the NEPA document when discussing impacts. Resources that are listed in or eligible for the NRHP are covered by the Section 106 process; historic, architectural, archaeological, and cultural resources that are not eligible but are afforded protection under other laws should be discussed separately in the environmental document.

In making a Section 106 effect determination, the FAA must consider several different types of impacts to historic properties, including direct and indirect impacts from both construction and operation activities. For the Section 106 process, provide a written effects determination along with supporting documentation to the SHPO/THPO and the consulting parties (see 36 CFR § 800.5). Determinations make one of the following conclusions: (1) no historic properties present in the APE; (2) no adverse effect on historic properties; or (3) adverse effect on historic properties. These are described in detail below.

#### 8.3.1.1. No Historic Properties Present in the Area of Potential Effects

If an undertaking has the potential to cause effects on historic properties, but no such properties have been identified in the APE, a finding of **No Historic Properties Affected** is appropriate. If no historic properties have been identified within the APE, and no resources have been identified that are subject to the Archaeological Resources Protection Act, NAGPRA, AIRFA, Section 4(f) of the DOT Act, the Archeological and Historic Preservation Act, Executive Order 13007, *Indian Sacred Sites*, 61 *Federal Register* 26771, (May 29, 1996), or other laws covering specific types of cultural resources, then no further analysis is needed in the NEPA document.

In making this finding, the FAA must provide the information described in 36 CFR § 800.11(d) to the SHPO/THPO, notify consulting parties, and make the documentation available for public

inspection prior to approving the undertaking. If the SHPO/THPO agrees with the finding, the FAA's responsibilities under Section 106 are concluded. If the SHPO/THPO does not respond within 30 days, the FAA's responsibilities under Section 106 are fulfilled, and the agency may proceed with the undertaking.

### **8.3.1.2. Historic Properties Present in the Area of Potential Effects**

If there are historic properties in the APE, the FAA must assess what effect the undertaking would have on those historic properties. An effect is defined as an alteration to the characteristics of a historic property qualifying it for inclusion on, or eligible for inclusion on, the NRHP (see 36 CFR § 800.16(i)). There are three possible outcomes when assessing effects: (1) no historic properties affected; (2) no adverse effect on historic properties; or (3) adverse effect on historic properties.

#### ***No Historic Properties Affected***

If the undertaking will have no effect on historic properties, a finding of **No Historic Properties Affected** is appropriate (e.g., project-related noise that does not permanently alter a setting that contributes to the historic significance of a qualified historic property for the NRHP). The FAA must provide the documentation outlined in 36 CFR § 800.11(d) to the SHPO/THPO, notify consulting parties, and make the documentation available for public inspection prior to approving the undertaking. If the SHPO/THPO agrees with the finding, the FAA's responsibilities under Section 106 are concluded. If the SHPO/THPO does not respond within 30 days, the FAA's responsibilities under Section 106 are fulfilled and the FAA may proceed with the undertaking.

#### ***No Adverse Effect on Historic Properties***

If a historic property is present within the APE and it is possible that a project may affect the property's historic characteristics, the FAA must notify all consulting parties, invite their views on the effects, and apply the criteria of adverse effect listed in 36 CFR § 800.5(a)(1) in consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties. In doing so, the FAA must consider any views provided by consulting parties and the public. Adverse effects on historic properties include but are not limited to those which:

- physically destroy or damage the property;
- alter the property in a way that is inconsistent with the Secretary of the Interior's Standards for Treatment of Historic Properties (see 36 CFR part 68);
- remove the property from its historic location;
- change the character of the property's use, or of physical features within the property's setting that contribute to its historic significance;
- introduce an atmospheric, audible, or visual feature to the area that would diminish the integrity of the property's significant historic features (including its setting, provided the setting has been identified as a contributing factor to the property's historical significance);  
or

- result in neglect of a property which would cause its deterioration or the transfer, sale, or lease of a property out of Federal ownership or control without adequate protection to ensure the long-term preservation of the property's historic significance.

If the undertaking would not affect any historic properties in a way that would alter the characteristics that qualify those properties for the NRHP, or if the undertaking is modified or conditions are imposed to avoid such effects, the FAA, in consultation with the SHPO/THPO, can propose a finding of **No Adverse Effect**. **No Adverse Effect** determinations must be documented pursuant to 36 CFR § 800.11(e). The FAA must notify all consulting parties and provide them with the following documentation:

- A description of a project, specifying the Federal involvement, and the APE, including photographs, maps, and drawings, as necessary;
- A description of the steps taken to identify historic properties;
- A description of the affected historic properties, including information on the characteristics that qualify them for the NRHP;
- A description of a project's effects on historic properties;
- An explanation of why the criteria of adverse effect were found applicable or not applicable, including any conditions or future actions to avoid, minimize or mitigate adverse effects; and
- Copies or summaries of any views provided by consulting parties and the public.

If the SHPO/THPO agrees with the finding, and no consulting party objects, the FAA has no further obligations under Section 106.

If the SHPO/THPO disagrees with the finding within the 30-day period, the SHPO/THPO must provide reasons for that objection. The FAA must either consult with the SHPO/THPO to resolve the disagreement, or ask the ACHP to review the finding and concurrently notify all consulting parties that the request has been made. Likewise, if any other consulting party objects to the finding within the 30-day period, they must also notify the FAA of their objection, explain the reasons for the objections, and ask the ACHP to review the FAA's finding. Also, the ACHP may, on its own initiative, within the 30-day period, request the FAA's finding. The responsible FAA official must take into account the ACHP's opinion in making a final finding of no adverse effects (see 36 CFR § 800.5); however, the opinion does not require the FAA to proceed in any specific manner. If the ACHP does not respond within 15 days (or 30 days, if the ACHP duly extends the time to issue its opinion), ACHP concurrence with the finding may be assumed.

A record of this finding must be maintained and information on it must be provided to the public when requested. In certain circumstances, however, such information may be treated by the FAA Administrator or any public official receiving grant assistance as confidential and non-releasable pursuant to Section 304 of the NHPA (see 36 CFR § 800.11(c)). The most common use of this confidentiality clause is to protect the location of sensitive archaeological sites.

In the event the proposed action or alternative(s) involves corridors, large land areas, or when access to the property is restricted, the FAA may implement phased assessments of effects for each alternative under consideration (see 36 CFR § 800.5(a)(3)).

### *Adverse Effect on Historic Properties*

A proposed finding of **Adverse Effect on Historic Properties**, made in consultation with the SHPO/THPO and all other consulting parties, is appropriate when a project would:

- physically destroy or damage the property;
- alter the property in a way that is inconsistent with the Secretary of the Interior's Standards for Treatment of Historic Properties (see 36 CFR part 68);
- remove the property from its historic location;
- change the character of the property's use, or of physical features within the property's setting that contribute to its historic significance;
- introduce an atmospheric, audible, or visual feature to the area that would diminish the integrity of the property's significant historic features (including its setting, provided the setting has been identified as a contributing factor to the property's historical significance); or
- result in neglect of a property which would cause its deterioration or the transfer, sale, or lease of a property out of Federal ownership or control without adequate protection to ensure the long-term preservation of the property's historic significance.

If the above criteria for adverse effects apply, 36 CFR § 800.6 requires Federal agencies to try to find a way to avoid, minimize, or mitigate those impacts. This is accomplished through consultation with the SHPO/THPO, the ACHP, the public, and other consulting parties, as applicable. The agency must also document the finding to the ACHP and consulting parties pursuant to 36 CFR § 800.11(e) (see *No Adverse Effect on Historic Properties* under section 8.3.1.2)). If the undertaking will have an adverse effect on an NHL, follow the procedures set forth in 36 CFR § 800.10. When the affected property is of religious or cultural importance to tribes or Native Hawaiian organizations, said party must be included in the consultation and must receive information in 36 CFR § 800.11(e), unless protected under the confidentiality provisions of 36 CFR § 800.11(c).

The public must be informed if an undertaking will have an adverse effect on historic properties. This may be satisfied as part of the Section 106 consultation process, but the NEPA process can also satisfy this requirement by describing potential adverse effects of the proposed action and the alternatives in a draft EA or draft EIS and affording the public an opportunity to comment. If a CATEX is being used for NEPA compliance or a draft EA is not going to be published for comment, the FAA should make other arrangements to provide the public with enough time and information to meaningfully comment prior to approval of the undertaking.

These measures to avoid, minimize, or mitigate impacts will generally form the basis for a MOA on how a project will proceed.

### **8.3.2. Significance Determination**

The FAA has not established a significance threshold for the full range of historical, architectural, archeological, and cultural resources in FAA Order 1050.1F; however, the FAA has identified a factor to consider when evaluating the context and intensity of potential environmental impacts for historical, architectural, archeological, and cultural resources (see Exhibit 4-1 of FAA Order 1050.1F).



This factor includes, but is not limited to, situations in which the proposed action or alternative(s) would result in a finding of *Adverse Effect* through the Section 106 process. Please note that this factor is not intended to be a threshold. The NHPA regulations at 36 CFR § 800.8(a) state that an *Adverse Effect* finding does not necessarily require an EIS under NEPA. The FAA makes the determination on the level of impact under NEPA and whether to prepare an EA or EIS. Advice from the ACHP and SHPO/THPO may assist the FAA in making this determination. Mitigation of adverse effects may be considered sufficient to keep impacts below levels of significance (see Section 8.4 below).

For historic properties subject to Section 4(f) of the DOT Act, a significant impact would occur when the action involves more than a minimal physical use of a Section 4(f) resource or constitutes a “constructive use” based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource (see Chapter 5 of this Desk Reference).

## 8.4. Mitigation – Resolution of Adverse Effects

Some examples of potential measures to avoid, minimize, or mitigate adverse impacts to historical, architectural, archeological, and cultural resources include the following:

- To the extent practicable, modifying, conditioning, or limiting activities associated with the undertaking to lessen effects;
- Implementing standard Best Management Practices during construction and maintenance activities to reduce potential impacts;
- Educating visitors, members of the general public, construction, maintenance, and operations personnel, as well as contractors, and tenant organizations, on the importance of cultural resources, the need to stay within defined work zones, and the legal implications of vandalism and artifact collecting;
- Training construction, maintenance, operations, contractor, and tenant personnel to recognize when archaeological resources or human remains have been discovered or when inadvertent damage has occurred to a resource, to halt ground disturbing activities in the vicinity of the discovery, and to notify appropriate personnel;
- Archival documentation of affected historic properties to Historic American Buildings Survey/Historic American Engineering Record standards;
- Monitoring the resource(s) during construction to ensure the construction goes as planned and no unforeseen impacts to the resource(s) occur;
- Monitoring by a qualified archaeologist of ground-disturbing activities during construction; and
- Conducting data recovery excavations of archaeological sites.

In most instances, the FAA and SHPO/THPO, in consultation with other consulting parties, work to avoid, minimize, or mitigate identified adverse effects. Sometimes the ACHP is included in this effort when it chooses to enter the process or the FAA invites them to do so.

It is the FAA’s intent to resolve adverse effects in all cases through consultation and cooperation. However, if the FAA, the SHPO/THPO, or the ACHP determine that further consultation would not be productive, any one of them may terminate consultation pursuant to the instructions in

36 CFR § 800.7. In such instances, the FAA must take into account the ACHP's comments in reaching a final determination regarding the action (see 36 CFR § 800.7(c)(4) for instructions).

## 8.5. Memorandum of Agreement

A MOA is a document that records the terms and conditions agreed upon to resolve the adverse effects of an undertaking upon historic properties. If the FAA prepares an MOA to meet Section 106 requirements, the MOA must contain the information discussed in 36 CFR § 800.11(f). If the FAA executes an MOA with other signatories before it circulates a draft NEPA document for comment, the document should include the MOA. An executed MOA must be included in a final NEPA document, unless extenuating circumstances delay the MOA until the FONSI or ROD. In these circumstances, the draft MOA should be included in the final NEPA document.

The execution of an MOA between the FAA and the other signatories concludes the FAA's responsibilities under Section 106. The MOA describes the undertaking and contains instructions and terms that must be implemented to avoid, minimize, or mitigate adverse effects. Upon execution of the MOA, the undertaking will proceed under the terms of the MOA. When the FAA and the SHPO/THPO develop an MOA, the FAA must send a copy of the signed MOA to the ACHP. When the ACHP is not participating and the FAA and the SHPO/THPO cannot agree, the FAA must request that the ACHP join in the consultation. Detailed information on MOAs is contained in 36 CFR § 800.6, particularly sections 800.6(b) and (c).

- **Signatories** – Signatories have sole authority to execute, amend, and terminate the MOA. If the ACHP is not participating in resolving adverse effects, the FAA and SHPO/THPO will sign the MOA. If the ACHP is participating, it too will sign the MOA.
- **Invited Signatories** – The FAA may invite other consulting parties to sign the MOA. Typically, these parties would be representatives of Indian tribes, Native Hawaiian organizations, Native Alaskans, or any other relevant organization in the area that attach religious or cultural significance to the affected historic property. They may also be any party that will be responsible for implementing the terms and conditions of the MOA (e.g., airport sponsor or licensee for commercial space operations). It is important to note that any party refusing to be an Invited Signatory does not negate an MOA or make it invalid.
- **Concurring Parties** – The FAA or other signatory(ies) may invite all consulting parties to concur with the MOA. Concurring parties do not have the right to execute, amend, or terminate an MOA; their concurrence only indicates that they are in agreement with its terms. Refusal of a party to concur in the MOA does not negate or invalidate the MOA. All consulting parties, whether concurring or not, should receive a copy of the executed MOA.

## 8.6. Programmatic Agreement

A PA is a document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex undertaking, or other situations in accordance with 36 CFR § 800.14(b). To achieve agreement on how impacts will be treated in the future, often after the NEPA process is complete, the FAA and the ACHP (or the SHPO or other consulting party) may negotiate a PA. A PA may be negotiated in the following situations:

When effects on historic properties are similar and repetitive or are multi-state or regional in scope;

- When effects on historic properties cannot be fully determined prior to approval of an undertaking;
- When non-Federal parties are delegated major decision-making responsibilities;
- Where routine management activities are undertaken at Federal installations, facilities, or other land-management units; or
- Where other circumstances warrant a departure from the normal Section 106 process.

Typically, it is necessary to describe a project, including the timeframe and whether a project will be staged, in order to successfully develop a PA. For example, before the ACHP will agree to the PA, it should be relatively clear when studies will be completed; the APE and the types of expected adverse effects; as well as the potential for mitigation. For more information, see 36 CFR § 800.14(b).

A PA may be negotiated with the ACHP and the National Conference of SHPOs if a project will be repeated in several different states. The FAA may work through the National Association of THPOs to facilitate coordination with tribes. If these circumstances arise, consult the FAA FPO in AEE to coordinate possible agreement options.

Compliance with the procedures established by an approved PA satisfies Section 106 responsibilities for all individual projects of the program covered by the agreement until it expires or is terminated by one of the parties to the PA. If the ACHP determines that the terms of the PA are not being carried out, or that the agreement has been terminated, the FAA must comply with the Section 106 consultation requirements with regard to the individual projects of the program covered by the agreement.

## **8.7. Section 106 Documentation**

In addition to reporting the outcome of Section 106 consultation in the body of the NEPA document, Section 106 consultation and correspondence should be referenced and included in an appendix to the NEPA document. Documentation should include all information needed to show Section 106 compliance, and not just a record of consultation. Documentation in the appendix should include, at a minimum, the following:

- Section 106 Initiation letters to SHPO/THPO and those parties identified as potential consulting parties and any responses received;
- Requests for government-to-government tribal consultation sent to any tribes that expressed a desire to consult on the action and any responses received;
- Correspondence related to consultation on the APE;
- The FAA's determination of effect;
- SHPO/THPO concurrence on an effect finding;
- Any comments from consulting parties and/or the public; and
- An executed MOA or PA, if applicable.

The FAA has a responsibility under the Section 304 of the NHPA to acknowledge the sensitive nature of some cultural resources and keep geographic information confidential when disclosure may cause significant invasion of privacy, risk, or harm to the resource, or impede the use of a traditional religious site by practitioners. In most cases, the NEPA document should **not** provide the location of, or any geographic information on, historic properties because of concerns with intentional disturbance or theft of the properties.

## 8.8. Post-NEPA Review Discoveries

At times, historic properties or unanticipated effects on historic properties may be discovered that were completely unanticipated. In these cases, reasonable efforts should be taken to avoid, minimize, or mitigate adverse effects, if any, to such properties.

- **Discovery prior to project approval or prior to starting construction on an approved project.** If the FAA has not yet approved a project, or if construction on an approved project has not yet begun, and the FAA discovers historic properties or unanticipated effects on the historic properties, the FAA must consult to resolve any adverse effects as defined in 36 CFR § 800.5.
- **Discovery after project approval or after construction has begun on an approved project.** If the FAA has approved a project and construction has begun, and then historic properties or unanticipated effects on the historic properties are discovered, project construction must stop immediately in the vicinity of the discovered resources. The FAA must determine what actions can be taken to resolve any adverse effects. Within 48 hours of discovery, the FAA must also notify the SHPO/THPO and any tribe, Native Hawaiian organization, Native Alaskans, or any other relevant organization in the area that might attach religious and cultural significance to the affected property, and the ACHP. The notification should describe the actions proposed by the FAA to resolve the adverse effects. The relevant entity and the ACHP shall respond within 48 hours of notification and the FAA should take into account their recommendations and carry out appropriate actions. The FAA must also provide a report of the actions when they are completed.

### Eligibility of post-review discoveries

Following consultation with the SHPO/THPO, the FAA may assume, for the purposes of Section 106 consultations, that the newly discovered properties are eligible for the NRHP. The FAA must list the NRHP criteria used to assume the property's eligibility so that the information can be used to resolve adverse effects.

### *Post-review discoveries on Tribal lands*

The FAA must comply with applicable tribal regulations and procedures and obtain the concurrence of the tribe for a project if there is no process for addressing such post-review discoveries.

***When discovered property is of value solely for its scientific, prehistoric, historic, or archaeological data***

Where the FAA, SHPO/THPO, and any tribe, Native Hawaiian organization, Native Alaskans, or any other relevant organization that might attach religious and cultural significance to the affected property agree that the property is of value solely for its scientific, prehistoric, historic, or archaeological data, the FAA may comply with the Archeological and Historic Preservation Act instead of the procedures under Section 106 and mitigate the impacts to the property through excavation and analysis of the site, in what is commonly called “data recovery.”

## **8.9. Sample Letters for Section 106**

The following letters can assist the FAA in the Section 106 process. These sample letters include:

- Section 106 Initiation (Exhibit 8-6);
- Tribal Government-to-Government Initiation (Exhibit 8-7);
- Section 106 APE Determination (Exhibit 8-8); and
- Finding of Effect (Exhibit 8-8).

Note that all initiation letters addressed to a tribe should follow the government-to-government protocols discussed in Paragraph 2-4.4 of FAA Order 1050.1F and should be sent specifically to a tribe and not as a broadcast letter to many tribes. Once a tribe agrees to be a consulting party in the Section 106 process, then group correspondence copied to all would be appropriate unless a tribe specifically asked for some level of confidentiality.

**Exhibit 8-6. Section 106 Initiation Letter**

U.S. Department of Transportation  
Federal Aviation Administration

(Name)

State Historic Preservation Officer

(Address)

RE: Section 106 Consultation Initiation for [project name]  
[city],[county],[state]

Dear (Name):

The Federal Aviation Administration (FAA) has (received funding for/is granting/is permitting) (short description of the project), which has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). A project description is included as Attachment 1. The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA) and the FAA has initiated preparation of an (appropriate NEPA document) to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

This letter is intended to initiate Section 106 consultation and solicit any initial comments you may have on the proposed undertaking. The FAA is inviting the following tribes to participate in this consultation: (tribes invited for government-to-government consultation). The FAA may also identify additional consulting parties through the NEPA scoping process.

The FAA will provide you with a determination of the Area of Potential Effects (APE) for the proposed project and a proposed level of effort for the identification of historic properties.

If you have any initial comments or questions on this undertaking, please contact me directly at (phone number), or e-mail (email address).

Sincerely,

(Name and Title)

Enclosures

**Exhibit 8-7. Tribal Government-to-Government Initiation Letter**

U.S. Department of Transportation  
Federal Aviation Administration

(Tribal Chairman Title and Name)  
(Tribe)  
(Address)

RE: Invitation for Government-to-Government Tribal Consultation for Section 106 review of  
the (Project Name)  
(city), (county), (state)

Dear Governor/Chairman (name):

The Federal Aviation Administration (FAA) has (received funding for/is granting/is permitting) (short description of the project), which has been determined an 'undertaking' subject to the National Historic Preservation Act (NHPA) and its implementing regulations under Section 106 36 CFR part 800 (as amended). A project description is included as Attachment 1. The proposed project and its associated activities are also subject to the National Environmental Policy Act (NEPA) and the FAA has initiated preparation of an (appropriate NEPA document) to meet its regulatory obligations. The agency intends to complete Section 106 in conjunction with the NEPA process.

The FAA has identified your tribe as potentially having an interest in the project area. Pursuant to 36 CFR § 800.2(c)(2)(B)(ii), the FAA is seeking input on properties of cultural or religious significance that may be affected by the undertaking, and inviting you to participate in government-to-government consultation in the Section 106 consultation process.

Please contact (name) via mail or email at (contact information) within 30 days of the receipt of this letter to confirm your intent to participate in this Section 106 consultation.

Sincerely,  
(Name)

Enclosures

CC: Tribal Historic Preservation Officer/Cultural Resources Tribal contact

**Exhibit 8-8. Section 106 APE Determination Letter**

U.S. Department of Transportation  
Federal Aviation Administration

(Name)

(Consulting Party)

(Address)

RE: Area of Potential Effects (APE) Definition and proposed Level of Identification Effort for  
(project name)  
(city), (county), (state)

Dear (Name):

The FAA, as part of the Section 106 review of (project name), has determined an appropriate Area of Potential Effects (APE) for the proposed undertaking based on the enclosed project description (attachment 1) and an assessment of the undertaking's potential direct and indirect effects.

*Direct Effects:* (description of ground disturbing activity that may directly affect archaeological sites or historic buildings or structures)

*Indirect Effects:* Both construction and operational activities may have indirect effects on historic properties. (Describe potential indirect effects, i.e., visual effect to setting, operational noise, and vibration from construction or from ongoing operations). The FAA conducted the enclosed preliminary noise and view-shed analysis to determine appropriate boundaries for the APE for indirect effects. (Summary of study and results, if applicable).

*APE Definition:* Based on the scope of the proposed undertaking and preliminary noise and view-shed analysis, the FAA has defined the APE as: (geographic definition of the APE, i.e., all areas subject to direct ground disturbance and a one mile buffer around the proposed new facility) (Attachment 3)

The FAA recommends the following to identify historic properties within the APE: (describe proposed identification efforts, i.e., a literature search for archaeological sites and historic structures; a reconnaissance survey of buildings and structures within the APE, Phase I archaeological testing within the APE for direct effects). Given the scope of the project and the magnitude of the potential effects, the FAA finds this effort meets the reasonable and good faith effort set forth in 36 CFR § 800.4(b)(1) at this time.

Pursuant to 36 CFR § 800.4(a)(1), the FAA is seeking comment on the APE and identification efforts for this undertaking. Please specify whether you concur with this APE or, if not, your concerns with the APE as defined.

Sincerely,  
(Name)



**Exhibit 8-9. Finding of Effect Letter**

U.S. Department of Transportation  
Federal Aviation Administration

(Name)  
(Consulting Party)  
(Address)

RE: Finding of (Effect finding, i.e. no historic properties affected/no adverse effect/adverse effect for (project name)  
(city), (county), (state)

Dear (Name):

As part of the Federal Aviation Administration's (FAA's) Section 106 review and pursuant to 36 CFR § 800.4, the FAA has undertaken identification efforts for the (project name). Based on the results of these efforts the FAA has determined a finding of (effect finding) is appropriate for this undertaking.

*Tribal Consultation:* The FAA initiated Section 106 consultation with the following Native American tribes: (tribal list). Of those tribes the (x) expressed interest in participating in consultation, the (x) did not want to participate in the consultation, and the (x) did not respond to the FAA's correspondence. All project documentation and this determination of effect letter has been provided to those tribes participating in the consultation.

*Area of Potential Effects:* The Area of Potential Effects (APE) for this undertaking was defined as (describe APE). This APE was reviewed and concurred upon by the State Historic Preservation Office (SHPO) in a letter dated (date) and by the following consulting parties: (parties that responded to APE letter).

*Identification Efforts:* The FAA consulted with SHPO and the consulting parties on an appropriate level of identification effort for this undertaking in a letter dated (provide date). (Describe the level of effort/studies undertaken to identify historic properties). The studies, entitled (title of studies), are enclosed for your review.

*Historic Properties in the APE:* The enclosed surveys identified (give summary of survey results including what historic properties, if any, were identified in the APE. Describe those historic properties in the APE listed in, or found to be eligible for listing in the National Register of Historic Places).

*Finding of Effect:* (#) historic properties were identified in the project APE.

(Provide an analysis of the effects the project will have on each of the historic properties. You do **not** need to consider those sites that are not historic properties or any sites outside of the APE).

Based on the results of the studies and an assessment of effects to historic properties, the FAA has determined that this undertaking will have (effect finding) on historic properties. Please review this finding and the enclosed documentation, in accordance with (appropriate regulatory

**Exhibit 8-9. Finding of Effect Letter**

citation) and provide either your concurrence or non-concurrence within the 30 day regulatory time frame.

The documentation provided herein meets the regulatory standard for documenting this effect determination in accordance with (appropriate regulatory citation). If you have questions or concerns regarding this finding or the sufficiency of documentation, please contact the FAA immediately at (name and contact number/email).

Sincerely,  
(Name)

Enclosures

## 9. Land Use

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The compatibility of existing and planned land uses with an aviation or aerospace proposal is usually associated with noise impacts, as described in Chapter 11, Noise and Noise-Compatible Land Use. In addition to the impacts of noise on land use compatibility, other potential impacts of FAA actions may also affect land use compatibility (e.g., disruption of communities, relocation, induced socioeconomic impacts, land uses protected under Section 4(f) of the DOT Act). The impacts on land use, if any, should be analyzed and described under the appropriate impact category with any necessary cross-references to the Land Use section of the NEPA document to avoid duplication.

Section 1502.16(c) of the Council on Environmental Quality (CEQ) Regulations requires the discussion of environmental impacts including “[p]ossible conflicts between the proposed action and the objectives of Federal, regional, State, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned.” Where an inconsistency exists, the NEPA document should describe the extent to which the agency would reconcile its action with the plan (see Section 1506.2(d) of the CEQ Regulations).

For airport actions, the Land Use section of the environmental document shall include documentation to support the required airport sponsor’s assurance under 49 U.S.C. § 47107(a)(10), formerly Section 511(a)(5) of the 1982 Airport Act, that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. The assurance must be related to existing and planned land uses.

The Airport Development Grant Program (see 49 U.S.C. § 47101 et seq.) requires that a project may not be approved unless the Secretary of Transportation is satisfied that the project is consistent with plans (existing at the time a project is approved) of public agencies for development of the area in which the airport is located (see 49 U.S.C. § 47106(a)(1)).

## 9.1. Regulatory Setting

Exhibit 9-1 lists the statutes, regulations, and Executive Orders that may be relevant to the proposed project.

**Exhibit 9-1. Statutes, Regulations, and Executive Orders Related to Land Use**

Statute or Regulations	Location in U.S. Code	Implementing Regulation	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Airport and Airway Improvement Act of 1982, and subsequent amendments	49 U.S.C. § 47107(a)(10)	Not applicable	FAA	AIP funding for an airport development project may not be approved unless the Secretary of Transportation receives written assurance satisfactory to the Secretary that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including the landing and takeoff of aircraft.
Airport Improvement Program	49 U.S.C § 47106(a)(1)	Not applicable	FAA	AIP funding for an airport development project may not be approved unless the Secretary of Transportation is satisfied that a project is consistent with plans (existing at the time a project is approved) of public agencies for development of the area in which the airport is located.
Airport Safety, Protection of Environment, Criteria for Municipal Solid Waste Landfills		40 CFR § 258.10	EPA	Addresses restrictions on municipal solid waste landfills relative to airports.
State and local regulations	Not applicable	Not applicable	Applicable state or local agency	State and local agencies adopt and implement planning and land use regulations, such as land use plans and zoning laws.

<sup>a</sup> U.S.C. = United States Code; CFR= Code of Federal Regulations; AIP = Airport Improvement Program

### 9.1.1. Consultations, Permits, and Other Approvals

Consultation with the state, tribal, or local land use authority for the study area should be done when land use impacts would be involved in the proposed action or alternative(s).

## 9.2. Affected Environment

For land use, the study area should include any areas that may be affected by the proposed action or alternative(s), including construction-related activities.

To describe the affected environment for land use, the following should be determined:

- *Existing* land uses within the study area, and
- *Planned and future* land uses within the study area.

State, tribal, and local land use planning agencies may be of assistance in providing land use data and identifying applicable state and/or local land use plans, land management plans, and/or zoning laws which might be relevant to land use in the study area. Local zoning information is often available online. The National Land Cover Database 2006 and aerial/satellite imagery can also provide information for the identification of land uses (note that the National Land Cover Database was last updated in 2006, and thus may not be accurate for areas that have experienced substantial growth since 2006). As these sources may not be updated regularly, a combination of aerial and satellite imagery and a windshield survey (i.e., on-the-ground observation) will often provide the most accurate existing land use mapping. Existing land use data is also needed for the analysis of noise and noise-compatible land use (see Chapter 11 of this Desk Reference), and much of the same data will be required. The NEPA document should identify the entity that owns or is responsible for managing the land in the affected environment.

State, local, or regional planning documents, including general plans, area plans, master plans, or specific plans can provide data regarding planned future land uses in the study area. Note that multiple jurisdictions may propagate plans for areas surrounding and including the site at multiple levels of government ranging from municipalities to the state. For Federal lands, the Federal agency managing the land may have adopted a land use plan identifying planned land uses. Some planned land uses described in these sources may be reasonably foreseeable, whereas others may be remote and speculative (see Chapter 15, Cumulative Impacts, of this Desk Reference for a discussion of reasonably foreseeable future actions).

## 9.3. Environmental Consequences

Conflicts may occur when the proposed action or alternative(s) creates impacts that are incompatible with existing and/or future planned uses in the study area. The impacts of the proposed action and alternative(s) on land use, if any, should be analyzed and described under the appropriate impact category with any necessary cross-references to the Land Use section of the NEPA document to avoid duplication. Where land use impacts are not discussed under other impact categories, the discussion of those impacts should be presented within the Land Use section. For example, a change in runway configuration (e.g., runway extension) may require relocation of the Runway Protection Zone (RPZ) into a residential area with the result that houses may need to be acquired to ensure land use compatibility within the RPZ.

The compatibility of land uses in the vicinity of an airport may also need to be assessed to ensure those uses do not adversely affect safe aircraft operations. Examples of such land uses that may adversely affect those operations include municipal landfills (40 CFR § 258.10), wildlife refuges, wetland mitigation that may attract wildlife species hazardous to aviation, and unrestricted height zoning. The presence of any of these land uses within the distances referenced by FAA

Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants on or Near Airports*, should be disclosed in this section.

As discussed earlier, Section 1506.2(b) of the CEQ Regulations requires that NEPA documents discuss any inconsistency with approved state and/or local plan(s) and law(s) (whether or not Federally-sanctioned). Where an inconsistency exists, the statement should describe the extent to which the FAA would reconcile its proposed action with the plan or law. Further, for airport actions, the NEPA document must include a letter from the public agency authorized by the state to plan for the area surrounding the airport that states the proposed action is consistent with existing land use plans (see 49 U.S.C. § 47106(a)(1)).

### **9.3.1. Significance Determination**

The FAA has not established a significance threshold for land use, and the FAA has not provided specific factors to consider in making a significance determination for land use in Exhibit 4-1 of FAA Order 1050.1F. The determination that significant impacts exist in the land use impact category is normally dependent on the significance of other impact categories. Section 11.3.1 of this Desk Reference provides guidance on land use impacts in relation to aircraft noise. If the proposal would result in other impacts that have land use ramifications, for example, disruption of communities, relocation, and induced socioeconomic impacts, the impacts on land use should be analyzed in these contexts and described accordingly under the appropriate impact category with any necessary cross-references to the Land Use section to avoid duplication. While the NEPA document must include a discussion regarding consistency with state and/or local plans, an inconsistency by itself does not automatically result in a significant impact.

## **9.4. Mitigation**

Mitigation activities proposed to address land use impacts would normally be discussed under the appropriate impact category and cross-referenced to the Land Use section of the NEPA document. Examples of potential measures to mitigate impacts related to land use include:

- working with affected business and/or landowners to appropriately redress construction/operation-related damage to landowner's property (including access restrictions);
- changing site design;
- phasing a project to be consistent with planned development in the area; and
- relocating development away from non-compatible land uses (e.g., landfills, wildlife refuges, wetland mitigation).

## **10. Natural Resources and Energy Supply**

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As an impact category, natural resources and energy supply provides an evaluation of a project's consumption of natural resources (such as water, asphalt, aggregate, wood, etc.) and use of energy supplies (such as coal for electricity; natural gas for heating; and fuel for aircraft, commercial space launch vehicles, or other ground vehicles). Consumption of natural resources and use of energy supplies may result from construction, operation, and/or maintenance of the proposed action or alternative(s).

It is the policy of the FAA (as discussed in FAA Order 1053.1, *Energy and Water Management Program for FAA Buildings and Facilities*), consistent with NEPA and the Council on Environmental Quality (CEQ) Regulations, to encourage the development of facilities that exemplify the highest standards of design, including principles of sustainability. All elements of the transportation system should be designed with a view to their aesthetic impact and conservation of resources such as energy, pollution prevention, harmonization with the community environment, and sensitivity to the concerns of the traveling public.

## 10.1. Regulatory Setting

Exhibit 10-1 provides a summary of the statutes and Executive Orders that may be relevant to natural resources and energy supply impacts. See Appendix B.7 for more detailed information about these requirements.

**Exhibit 10-1. Statutes and Executive Orders Related to Natural Resources and Energy Supply**

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s) or Instructions	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Energy Independence and Security Act	42 U.S.C. § 17001 et seq.		DOE	Requires Federal agencies to take actions to move the United States toward greater energy independence and security, to increase the production of clean renewable fuels, to protect consumers, to increase the efficiency of products, buildings, and vehicles, to promote research on and deploy greenhouse gas (GHG) capture and storage options, and to improve the energy performance of the Federal government.
Energy Policy Act	42 U.S.C. § 15801 et seq.		DOE	Requires Federal agencies to take actions to ensure jobs for our future with secure, affordable, and reliable energy.
Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management	72 <i>Federal Register</i> 3919, (January 26, 2007)	Implementing instructions available online at: <a href="http://www.epa.gov/greeningepa/documents/eo13423_instructions_508.pdf">http://www.epa.gov/greeningepa/documents/eo13423_instructions_508.pdf</a>	FAA	Instructs Federal agencies to advance the nation's energy security and environmental performance by achieving specified goals.



Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s) or Instructions	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance	74 <i>Federal Register</i> 52117, (October 8, 2009)	Not applicable, however note that there are associated documents (e.g., <a href="#">Federal Greenhouse Gas Accounting and Reporting Guidance<sup>1</sup></a> , and <a href="#">Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings<sup>2</sup></a> )	FAA	Establishes an integrated strategy towards sustainability in the Federal government and to make reduction of GHG emissions a priority for Federal agencies.

<sup>a</sup> U.S.C. = United States Code; DOE = U.S. Department of Energy; GHG = Greenhouse gases

Sections 1502.16(e) and (f) of the CEQ Regulations require that Federal agencies consider energy requirements, natural depletable resource requirements, and the conservation potential of alternatives and mitigation measures in the Environmental Consequences section of NEPA documents.

Additional requirements apply only to Federal facilities under the Energy Policy Act (EPA); the Energy Independence and Security Act (EISA); Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, 72 *Federal Register* 3919, (January 26, 2007); and Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 *Federal Register* 52117, (October 8, 2009), and provide guidance to Federal agencies regarding the use of natural resources and energy supply.

### 10.1.1. Permits, Certifications, and Other Approvals

No Federal permits or certifications are required for natural resources and energy supply; however, consult with state and local entities, as necessary, to determine if any permits may need to be obtained at that level.

### 10.1.2. Consultation

Executive Order 13514 requires agencies to coordinate with regional ecosystem, watershed, and environmental management programs. Consult with local agencies around the study area as they

<sup>1</sup> [http://www.whitehouse.gov/sites/default/files/microsites/ceq/ghg\\_guidance\\_document\\_0.pdf](http://www.whitehouse.gov/sites/default/files/microsites/ceq/ghg_guidance_document_0.pdf)

<sup>2</sup> [http://www.epa.gov/oaintrnt/documents/sustainable\\_mou\\_508.pdf](http://www.epa.gov/oaintrnt/documents/sustainable_mou_508.pdf)

typically understand the energy and resource constraints of the area. In such cases, the NEPA document (e.g., the appendix) or a project administrative file should include letters or documents addressing the capacities of local public utilities and suppliers to provide energy and natural resources for the proposed action and alternative(s). The goal of this consultation is “aligning Federal policies to increase the effectiveness of local planning for energy choices such as locally generated renewable energy.”<sup>3</sup> If there are major changes in natural resource or energy supply requirements, the following organizations should be consulted if projected demands can be met by existing or planned source facilities:

- State, tribal, and local agencies responsible for enforcing local rules, ordinances, and guidelines – may provide insight on recommended sustainability measures;
- Local utility companies – may have useful information on the available and planned electrical, natural gas, water, and sewage capabilities of the area; and
- Local suppliers of consumable construction materials – may be a good source of information if there are unusual construction circumstances.

If, during consultation, local agencies or businesses that provide information on energy or natural resource supplies recommend sustainability measures, consider incorporating those suggestions.

If an Environmental Impact Statement (EIS) is being prepared and the proposed action or alternative(s) has energy implications, the FAA may want to invite the DOE to become a cooperating agency in the NEPA process due to its expertise on energy and consumable natural resources. DOE can aid the FAA in determining if any additional analyses are needed for energy use, and in judging the seriousness of impacts.

## 10.2. Affected Environment

To adequately describe the existing conditions for natural resources and energy supply within the study area, the NEPA document should, at a minimum, contain the following information:

- The suppliers of energy resources found in the area such as power plants, water utilities, sewage disposal utilities, and suppliers of natural gas and petroleum; and
- The amount of other resources such as water, asphalt, aggregate, and wood a project would use in the construction, operation, and maintenance of a project and identify where the suppliers are located.

## 10.3. Environmental Consequences

After the affected environment for natural resources and energy supply is adequately described, the potential impacts of the proposed action and alternative(s) on the natural resources and energy supplies in the study area should be evaluated. For Federal facilities this includes, based on Executive Order 13514, “identifying and analyzing impacts from energy usage and alternative energy sources in all Environmental Impact Statements (EIS) and Environmental Assessments (EA) for proposals for new or expanded Federal facilities under the National Environmental Policy Act of 1969, as amended.” It is recommended that enough information be included to

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<sup>3</sup> Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 *Federal Register* 52117, (October 8, 2009)

accurately explain the future demands for energy and natural resources at the proposed project's location as well as measures taken to minimize any impacts and a summary of consultation with local resource and energy managers.

The consideration should include the potential increased demands on energy utilities, water supplies and treatment, and natural resources that the proposed action or alternative(s) may cause. For example, major construction projects or operations often involve a high demand for energy and/or natural resources. When preparing a NEPA document, consider looking at whether and how a project plan could directly or indirectly increase demand on the following:

- The impacts to utilities servicing the area caused by changes in demand as a result of the action (in other words, increases in electricity demands, water usage, or sewage disposal);
- Water sources (rivers, lakes, aquifers, etc.) and if they have the capacity to support a project's construction, operation, and maintenance (for example, if a proposed project would require a large volume of water, the NEPA review should consider the availability of water from existing or planned water facilities or from surface or groundwater sources);
- Fuel consumption (including consumption from construction, operations, and maintenance that is directly or indirectly related to the proposed action or alternative(s));
- The impacts to consumable materials, especially scarce or unusual materials, in and around the study area. If scarce or unusual materials are needed for the proposed action or alternative(s), estimate the amount of consumable material that is available from local suppliers and determine what the current demand is for those resources; and
- State or local rules, ordinances, or guidelines that apply to natural resources, energy supply, and any resulting by-products of increased usage of either resource.

***Energy Intensity:*** The amount of energy (in British Thermal Units) consumed per gross square foot of the facility.

***Potable Water Intensity:*** The amount of potable water (in gallons) consumed per gross square foot of the facility.

### 10.3.1. Federal Facilities

EISA, EPCAct, and the Executive Orders cited in Exhibit 10-1 contain requirements for Federal facilities, which should be discussed in an EA or EIS, including any action involving large capital energy or water investment in an existing building; new construction or major renovation of an FAA-owned building or built to suit lease; and any proposed action or alternative(s) involving the development, redevelopment, or leasing of an FAA facility with a footprint that exceeds 5,000 square feet. For more information consult FAA Order 1053.1, *Energy and Water Management Program for FAA Buildings and Facilities*, or the FAA Office of Environment and Energy (AEE) Program Office.

For appropriate Federal facilities, discuss how the proposed action and alternative(s) contribute to the FAA's energy goals to reduce energy intensity in subject buildings by 30 percent by the end of fiscal year (FY) 2015 relative to the FY 2003 baseline (see Appendix B.7 of this Desk Reference; see also Section 2(a)(ii) of Executive Order 13423, and Section 431 of EISA (42 U.S.C. § 8253(a)(1))); achieve renewable electricity consumption not less than 10 percent in FY

2013 and thereafter (see DOT Memorandum: *Renewable Energy and Conservation Requirements at Department of Transportation (DOT) Operating Administrations – Immediate Action Required, 3/25/2011*); reduce potable water intensity 2 percent annually, or 26 percent by the end of FY 2020 relative to a 2007 baseline (see Section 2(d)(i) of Executive Order 13514); identify, promote, and implement water reuse strategies that reduce potable water consumption; and reduce consumption of industrial, landscaping, and agricultural water by 2 percent annually, or 20 percent by the end of FY 2020 relative to a FY 2010 baseline (see Section 2(d)(ii) of Executive Order 13514). See text box above for definitions of energy intensity and potable water intensity.

### **10.3.2. Significance Determination**

The FAA has not established a significance threshold for natural resources and energy supply in FAA Order 1050.1F; however, the FAA has identified a factor to consider when evaluating the context and intensity of potential environmental impacts for natural resources and energy supply (see Exhibit 4-1 of FAA Order 1050.1F). Please note that this factor is not intended to be a threshold. If this factor exists, there is not necessarily a significant impact.

This factor includes, but is not limited to, situations in which the proposed action or alternative(s) would have the potential to cause demand to exceed available or future supplies of these resources. For most actions, changes in energy demands or other natural resource consumption for FAA projects will not result in significant impacts. If an EA identifies problems such as demands exceeding supplies, additional analysis may be required in an EIS. Otherwise, it may be assumed that impacts are not significant.

To make a significance determination, evaluate the estimated amount of natural and energy resources that are expected to be needed for a project and compare the information to the local context of supply and demand to make an evaluation of significance. As mentioned above, contact local utilities and suppliers to evaluate capacities and local demand for the resources in question, or DOE in determining and judging the seriousness of impacts (especially if DOE is a cooperating agency).

## **10.4. Mitigation**

Examples of potential measures to mitigate impacts related to natural resources and energy supply include:

- following principles of environmental design and sustainability (including pollution prevention, waste minimization, and resource conservation) in project or program planning;
- incorporating into project design measures such as more efficient facility design and operation, or improved ground transportation or access; and
- utilizing energy from renewable sources to the extent possible.

## **11. Noise and Noise-Compatible Land Use**

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Sound is a physical phenomenon consisting of pressure fluctuations that travel through a medium, such as air, and are sensed by the human ear. Noise is considered unwanted sound that can disturb routine activities (e.g., sleep, conversation, student learning) and can cause annoyance. Aviation noise primarily results from the operation of fixed and rotary wing aircraft, such as departures, arrivals, overflights, taxiing, and engine run-ups. Noise is often the predominant aviation environmental concern of the public. Significant levels of aircraft noise in communities around airports generate the most issues. However, there are increasing concerns in areas of moderate noise exposure, and noise issues are raised by residents in suburban and rural areas where ambient noise is lower than in the more urbanized areas that tend to surround many commercial service airports. There are also special noise sensitivities with respect to certain resources such as national parks.

The compatibility of existing and planned land uses with proposed aviation actions is usually determined in relation to the level of aircraft noise. Federal compatible land use guidelines for a variety of land uses are provided in Table 1 in Appendix A of 14 CFR part 150, *Land Use*

*Compatibility with Yearly Day-Night Average Sound Levels.* These guidelines are included later in Section 11.6 of this chapter.

For aviation noise analyses, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of Yearly Day-Night Average Sound Level (DNL), the FAA's primary noise metric. The Community Noise Equivalent Level (CNEL) may be used in lieu of DNL for FAA actions needing approval in California.

DNL and CNEL account for the noise levels of all individual aircraft events, the number of times those events occur, and the period of day/night in which they occur. Both noise metrics logarithmically average aircraft sound levels at a location over a complete 24-hour period, with a 10-decibel (dB) adjustment added to those noise events occurring from 10:00 p.m. and up to 7:00 a.m. the following morning. The 10-dB adjustment has been added because of the increased sensitivity to noise during normal night time hours and because ambient (without aircraft) sound levels during nighttime are typically about 10-dB lower than during daytime hours. In addition, CNEL includes a 4.77-dB adjustment added to noise events occurring during the evening from 7:00 p.m. and up to 10:00 p.m.

## 11.1. Regulatory Setting

Exhibit 11-1 lists the primary statutes and regulations related to noise and noise-compatible land use impacts.

**Exhibit 11-1. Statutes and Regulations Related to Noise and Noise-Compatible Land Use**

Statute or Executive Order	Location in U.S. Code or Federal Register	Implementing Regulation(s) or Instructions	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
The Control and Abatement of Aircraft Noise and Sonic Boom Act of 1968	49 U.S.C. § 44715	49 CFR part 821, 14 CFR parts 21, 36, 91, 119, 135, and 150	FAA	Authorizes the FAA to prescribe standards for the measurement of aircraft noise and establish regulations to abate noise.
The Noise Control Act of 1972	42 U.S.C. §§ 4901-4918	40 CFR part 209	EPA	Amends the Control and Abatement of Aircraft Noise Sonic Boom Act of 1968 to add consideration of the protection of public health and welfare and to add the EPA to the rulemaking process for aircraft noise and sonic boom standards.

Statute or Executive Order	Location in U.S. Code or Federal Register	Implementing Regulation(s) or Instructions	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Aviation Safety and Noise Abatement Act of 1979	49 U.S.C. § 47501et seq.	14 CFR part 150	FAA	Directs the FAA to establish, by regulation, a single system for measuring noise and determining the exposure of people to noise which includes noise intensity, duration, frequency, and time of occurrence; and to identify land uses normally compatible with various noise exposures.
Airport and Airway Improvement Act of 1982	49 U.S.C. § 47101et seq.	Not Applicable	FAA	Authorizes funding for noise mitigation and noise compatibility planning and projects, and establishes certain requirements related to noise-compatible land use for Federally-funded airport development projects.
Airport Noise and Capacity Act of 1990	49 U.S.C. §§ 47521-47534 §§ 106(g), 47523-47527,	14 CFR part 161	FAA	Mandated the phaseout of Stage 2 jet aircraft over 75,000 pounds, and establishes requirements regarding airport noise and access restrictions for Stage 2 and 3 aircraft.
Prohibition on Operating Certain Aircraft Weighing 75,000 Pounds or Less Not Complying with Stage 3 Noise Levels [Section 506 of the FAA Modernization and Reform Act of 2012]	49 U.S.C §§ 47534	14 CFR part 91	FAA	After December 31, 2015, a person may not operate a civil subsonic jet airplane with a maximum weight of 75,000 pounds or less unless the Secretary of Transportation finds that the aircraft complies with stage 3 noise levels.
State/Local Noise Laws/Ordinances	Not applicable	Not applicable	Not applicable	There may be state or local laws or ordinances that apply to noise from a proposed project (e.g. construction noise). <sup>1</sup>

<sup>a</sup>U.S.C. = United States Code; CFR = Code of Federal Regulations; EPA = U.S. Environmental Protection Agency

<sup>1</sup>With limited exception, state and local regulation of aircraft noise is Federally-preempted.

### 11.1.1. Consultations, Permits, and Other Approvals

Most FAA actions do not involve any required Federal consultation processes, permits, or other approvals related to noise and noise-compatible land use. However, standards and regulations under 49 U.S.C. § 44715(a), including regulations to control and abate aircraft noise and sonic boom, require consultation with the Administrator of the EPA.

### 11.1.2. Projects Not Requiring a Noise Analysis

No noise analysis is needed for projects involving Design Group I and II airplanes (wingspan less than 79 feet) in Approach Categories A through D (landing speed less than 166 knots) operating at airports whose forecast operations in the period covered by the NEPA document do not exceed 90,000 annual propeller operations (247 average daily operations) or 700 annual jet operations (2 average daily operations). These numbers of propeller and jet operations result in DNL 60 dB contours of less than 1.1 square miles that extend no more than 12,500 feet from start of takeoff roll. The DNL 65 dB contour areas would be 0.5 square mile or less and extend no more than 10,000 feet from start of takeoff roll.

Also, no noise analysis is needed for projects involving existing heliports or airports whose forecast helicopter operations in the period covered by the NEPA document do not exceed 10 annual daily average operations with hover times not exceeding 2 minutes. These numbers of helicopter operations result in DNL 60 dB contours of less than 0.1 square mile that extend no more than 1,000 feet from the pad. Note that this rule applies to the Sikorsky S-70 with a maximum gross takeoff weight of 20,224 pounds and any other helicopter weighing less or producing equal or less noise levels.

### 11.1.3. FAA Aircraft Noise Screening Tools and Methodologies

Aircraft noise screening may rule out the need for more detailed noise analysis and provide documented support for a Categorical Exclusion (CATEX) if screening shows no potential for significant noise impacts. The FAA has multiple noise screening tools (NSTs) and methodologies. A list of available FAA screening tools is provided below. To use screening tools or equivalent screening methodologies not listed below, prior written approval from FAA Office of Environment and Energy (AEE) is required.

- [Area Equivalent Method \(AEM\)<sup>2</sup>](#)

For use in evaluating proposed actions and alternative(s) at an airport which result in a general overall increase in daily aircraft operations or the use of larger/noisier aircraft, as long as there are no changes in ground tracks or flight profiles. If the AEM calculations indicate that the action would result in less than a 17 percent (approximately a DNL 1 dB) increase in the DNL 65 dB contour area, there would be no significant impact over noise sensitive areas and no further noise analysis would be required. If the AEM calculations indicate an increase of 17 percent or more, or if the action is such that use of the AEM is not appropriate, then the noise analysis must be performed using the Aviation Environmental Design Tool (AEDT) to determine if significant noise impacts would result.

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<sup>2</sup> [http://www.faa.gov/about/office\\_org/headquarters\\_offices/apl/research/models/aem\\_model/](http://www.faa.gov/about/office_org/headquarters_offices/apl/research/models/aem_model/)



- *Guidance for Noise Screening of Air Traffic Actions*

For use when evaluating potential noise impacts as a result of changes in air traffic procedure actions. This is accomplished by examining traffic changes, altitude, and/or lateral changes in procedures to determine the potential for noise impacts due to procedure changes. The document is designed to step the user through a series of pre-screening tests to determine that there is no potential noise impact or that additional screening or noise analysis will be needed.

- Noise Screening Tools

For use in evaluating potential noise impacts as a result of changes in airport arrivals and departures above 3,000 feet above ground level (AGL). NST can be used for air traffic airspace and procedure actions where the study area is larger than the immediate vicinity of an airport, incorporates more than one airport, and/or includes actions above 3,000 feet AGL. For changes below 3,000 feet, Air Traffic may use NST or the Air Traffic Guidance for Noise Screening of Air Traffic Actions (discussed above). This is accomplished by screening the proposed changes to determine whether there is the potential to increase noise levels over communities beneath the aircraft route. The tool is designed to identify the following noise level changes:

- For DNL 65 dB and higher:  $\pm 1.5$  dB
- For DNL 60 dB to <65 dB:  $\pm 3$  dB
- For DNL 45 dB to <60 dB:  $\pm 5$  dB

- AEDT Plug-in is the Terminal Area Routing Generation, Evaluation and Traffic Simulation (TARGETS) tool

For use with Performance Based Navigation Procedures, this Plug-in allows the procedure designers to evaluate prospective procedures for potential noise impacts during the design phase. The tool is designed to identify the following noise level changes:

- For DNL 65 dB and higher:  $\pm 1.5$  dB
- For DNL 60 dB to <65 dB:  $\pm 3$  dB
- For DNL 45 dB to <60 dB:  $\pm 5$  dB

#### **11.1.4. FAA-Approved Models for Detailed Noise Analysis**

AEE has approved models for detailed noise analysis. Prior written approval from AEE is required to use another equivalent methodology or computer model. When requesting the use of an alternative model, justification of appropriateness of the use of that model over the use of the models below is required. Unless it can be justified, all noise analyses must be performed using the standard and default data. Modification to standard or default data in AEDT requires prior written approval from AEE. Guidance for submitting changes to the AEDT 2b standard or default data can be obtained on the FAA's Environmental Policy website at:

[http://www.faa.gov/about/office\\_org/headquarters\\_offices/apl/enviro\\_n\\_policy\\_guidance/guidance/media/AEDT\\_Guidance\\_Memo.pdf](http://www.faa.gov/about/office_org/headquarters_offices/apl/enviro_n_policy_guidance/guidance/media/AEDT_Guidance_Memo.pdf).

AEE has approved the following models for use for detailed noise analysis:

- FAA's AEDT 2b at: [http://www.faa.gov/about/office\\_org/headquarters\\_offices/apl/research/models/AEDT/](http://www.faa.gov/about/office_org/headquarters_offices/apl/research/models/AEDT/);
- U.S. Department of Defense's NOISEMAP;
  - NOISEMAP is used to model noise exposure in the vicinity of a military air base due to aircraft flights and engine run-up activities. It is used when the study consists predominantly of military operations. The FAA will consider using NOISEMAP and/or AEDT at joint-use airports.
- U.S. Department of Defense's Military Operating Area and Range Noise Model (MR\_NMAP); and
  - MR\_NMAP calculates noise levels from subsonic aircraft operations on Military Training Routes (MTRs), Military Operating Areas (MOAs), and Special Use Airspaces (such as ranges). The FAA will consider using MR\_NMAP and/or AEDT at joint-use airports.
- PCBOOM.
  - PCBOOM is used to calculate the location and magnitude of sonic-boom overpressures on the ground due to supersonic flight and commercial space operations.

All computer model input data should be collected early in the environmental process and the data should reasonably reflect current and forecast conditions relative to the proposed action and alternative(s). Input documentation for the noise analysis with one copy of the input data files and corresponding output files used in the noise analyses and the corresponding AEDT Administrative File should be provided to the responsible FAA official on electronic media specified by that official. If other equivalent methodologies or the use of non-standard or non-default data are approved, a description of the methodology or additional, non-standard or non-default data, along with a copy of AEE's approval, must be appended to the environmental document.

Noise monitoring data is not required for FAA noise analyses, but may optionally be included in a NEPA document. Noise monitoring data should not be used to calibrate the noise model or to make a finding of significance.

## 11.2. Affected Environment

The steps generally required to describe the affected environment for noise and noise compatible land use for NEPA documents are as follows:

- Determine the study area for noise analysis;
- Identify noise sensitive areas in the study area and pertinent land use information; and
- Describe current noise conditions in the study area.

The study area for noise is the three dimensional geographic area with the potential to be impacted by noise from the proposed project. The study area can vary in size from an airport's environs to a larger scale airspace redesign that includes multiple airports. An airport environs study area must be large enough to include the area within the DNL 65 dB contour, and may be larger. The study area for the noise analysis of a proposed change in air traffic procedures or airspace redesign may extend vertically from the ground to 10,000 feet AGL, or up to 18,000

feet AGL if the proposed action or alternative(s) are over a national park or wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.

A noise sensitive area, as defined in Paragraph 11-5.b(8) of FAA Order 1050.1F, is:

“[a]n area where noise interferes with normal activities associated with its use. Normally, noise sensitive areas include residential, educational, health, and religious structures and sites, and parks, recreational areas, areas with wilderness characteristics, wildlife refuges, and cultural and historical sites. For example, in the context of noise from airplanes and helicopters, noise sensitive areas include such areas within the DNL 65 dB noise contour. Individual, isolated, residential structures may be considered compatible within the DNL 65 dB noise contour where the primary use of land is agricultural and adequate noise attenuation is provided. Also, transient residential use such as motels should be considered compatible within the DNL 65 dB noise contour where adequate noise attenuation is provided. A site that is unacceptable for outside use may be compatible for use inside of a structure, provided adequate noise attenuation features are built into that structure (see Table 1, *Land Use Compatibility with Yearly Day-Night Average Sound Levels*, in Appendix A of 14 CFR part 150, *Airport Noise Compatibility Planning*). The FAA recognizes that there are settings where the DNL 65 dB standard may not apply. In these areas, the responsible FAA official will determine the appropriate noise assessment criteria based on specific uses in that area. In the context of facilities and equipment, such as emergency generators or explosives firing ranges, but not including aircraft, noise sensitive areas may include such sites in the immediate vicinity of operations, pursuant to the Noise Control Act of 1972 (See state and local ordinances, which may be used as guidelines for evaluating noise impacts from operation of facilities and equipment.)”

Noise compatibility or non-compatibility of land use is determined by comparing the aircraft DNL values at a site to the values in the land use compatibility guidelines (see Exhibit 11-3). Special consideration needs to be given to noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks, national wildlife and waterfowl refuges and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question. For example, the land use categories in the guidelines are not sufficient to determine the noise compatibility of areas within a national park or national wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.

Local land use jurisdictions may have noise and land use compatibility standards that differ from the FAA’s land use compatibility guidelines with respect to DNL 65 dB in 14 CFR part 150, Appendix A, Table 1 (“the part 150 guidelines,” see Exhibit 11-3). Such local standards must be disclosed to the extent required under 40 CFR 1502.16(c) and 1506.2(d). However, the FAA does not use local standards to determine the significance of noise impacts. Pertinent land use plans and a general overview of existing and planned uses of the land should be described.

The description of current noise conditions includes:

- DNL contours or noise grid points showing existing aircraft noise levels. Noise exposure contours must include DNL 65, 70, and 75 dB levels (additional contours may be provided on a case-by-case basis). Noise grids are sized to cover the study area for noise analysis. Multiple grids may be created, but at least one grid consists of population centroids from the

U.S. Census blocks. The differences in noise analysis for proposed airport development and other actions in the immediate vicinity of an airport and for air traffic airspace and procedure actions in a larger study area are described more fully in this guidance under the environmental consequences section. U.S. Census data may be supplemented by higher resolution data at the local municipality level, when available. Parcel level data may be available from the local property appraiser's office and is often updated at least once a year. Population and household information can be estimated at the parcel level provided that the local municipalities maintain current estimates of people per household and a housing unit count for multi-family parcels.

- The number of residences or people residing within each noise contour where aircraft noise exposure is at or above DNL 65 dB; or for a larger scale air traffic airspace and procedure action, the population within areas exposed at or above DNL 65 dB, at or above DNL 60 but less than DNL 65 dB, and at or above DNL 45 dB but less than DNL 60 dB.
- The location and number of noise sensitive uses in addition to residences (e.g., schools, hospitals, parks, recreation areas) that could be significantly impacted by noise; and
- Maps and other means to depict land uses within the noise study area. The addition of flight tracks may be helpful. Illustrations should be sufficiently large and clear to be readily understood.

The description of current noise conditions is usually confined to aircraft noise. However, the inclusion of other noise data, such as background or ambient noise or notable levels of noise in the study area from other sources (e.g., highways, industrial uses) is appropriate where such noise data is pertinent to understanding the affected environment and to considering the environmental impacts of the proposed action and alternative(s).

### 11.3. Environmental Consequences

The environmental consequences section of the NEPA document will include the analysis of the potential noise impacts of the proposed action and alternative(s) for each timeframe evaluated.

The noise analysis will include DNL contours (see text box), grid point, and/or change-of-exposure analysis for the proposed action and each alternative compared to the no action alternative for the same future timeframe.

**Noise Contour** – Lines on a map that represent equal levels (usually expressed in units of DNL/dB) of noise exposure.

Comparisons should be done for appropriate timeframes. Timeframes usually selected are the year of anticipated project implementation and 5 to 10 years after implementation. Additional timeframes may be desirable for particular projects.

For proposed airport development and other actions in the immediate vicinity of an airport, AEDT is used to provide noise exposure contours at the DNL 65, 70, and 75 dB levels (additional contours may be provided on a case-by-case basis). For all comparisons analyzed, the analysis will identify noise increases of DNL 1.5 dB or more over noise sensitive areas that are exposed to noise at or above the DNL 65 dB noise exposure level, or that would be exposed at or above the DNL 65 dB level due to a 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.

For actions in the immediate vicinity of an airport, the following information must be disclosed for each modeled scenario that is analyzed:

- The number of residences or people residing within each noise contour where aircraft noise exposure is at or above DNL 65 dB and the net increase or decrease in the number of people or residences exposed to that level of noise;
- The location and number of noise sensitive uses in addition to residences (e.g., schools, hospitals, parks, recreation areas) exposed to DNL 65 dB or greater;
- The identification of noise sensitive areas within the DNL 60 dB contour that are exposed to aircraft noise at or above DNL 60 dB but below DNL 65 dB and are projected to experience a noise increase of DNL 3 dB or more, only when DNL 1.5 dB increases are documented within the DNL 65 dB contour;
- Discussion of the noise impact on noise sensitive areas within the DNL 65 dB contour; and
- Maps and other means to depict land uses within the noise study area. The addition of flight tracks is helpful. Illustrations should be sufficiently large and clear to be readily understood.

For air traffic airspace and procedure actions where the study area is larger than the immediate vicinity of an airport, incorporates more than one airport, and/or includes actions above 3,000 feet AGL, AEDT is used. The noise analysis will focus on a change-in-exposure analysis, which examines the change in noise levels as compared to population and demographic information at population points throughout the study area. This is normally a noise grid analysis. Multiple grids may be created, but at least one grid must consist of population centroids from the U.S. Census blocks. Discrete receptor points<sup>3</sup> can also represent select noise sensitive area(s) or comprise a general receptor grid over the study area, either densely or sparsely spaced. Noise contours may be created at the FAA's discretion; however, noise contours are not required and are not normally used for the analysis of larger scale air traffic airspace and procedure actions. If the study encompasses a large geographical area, it is not recommended that contours be created for the representation of results below DNL 55 dB due to fidelity of receptor sets needed to create an accurate representation of the contour.

For air traffic airspace and procedure actions evaluated as described above, change-of-exposure tables and maps at population centers are provided to identify where noise will change by the following specified amounts:

- For DNL 65 dB and higher:  $\pm 1.5$  dB
- For DNL 60 dB to <65 dB:  $\pm 3$  dB<sup>4</sup>
- For DNL 45 dB to <60 dB:  $\pm 5$  dB<sup>5</sup>

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<sup>3</sup> Receptors are locations where noise is modeled. A collection of receptors are known as receptor sets. Grid points are an example of a receptor set.

<sup>4,5</sup> The FAA refers to noise changes meeting these criteria as "reportable." Although they are not significant (see Exhibit 4-1 of Order 1050.1F), they may cause a proposed action to be highly controversial on environmental grounds (see paragraph 5-2.b.10 of Order 1050.1F). This is determined by the Air Traffic Organization on a case-by-case basis.

The location and number of noise sensitive uses (e.g., schools, churches, hospitals, parks, recreation areas, etc.) exposed to DNL 65 dB or greater must be disclosed for each modeling scenario that is analyzed.

The noise compatibility of land use is determined by comparing the aircraft DNL values at a site to the values in the land use compatibility guidelines in 14 CFR part 150, Appendix A, Table 1. Environment Assessments (EAs) and Environmental Impact Statements (EISs) must disclose newly non-compatible land use regardless of whether there is a significant noise impact (see FAA Order 10.50.1 F, Paragraph B-1.5). Special consideration needs to be given to noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question. For example, the land use categories in the guidelines are not sufficient to determine the noise compatibility of areas within a national park or national wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.

### 11.3.1. Significance Determination

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for noise: *The action would increase noise by DNL<sup>6</sup> 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65dB level due to a DNL 1.5dB or greater increase, when compared to the no action alternative for the same timeframe.* For example, an increase from DNL 65.5 dB to 67 dB is considered a significant impact, as is an increase from DNL 63.5 dB to 65 dB. The determination of significance must be obtained through the use of noise contours and/or grid point analysis along with local land use information and general guidance contained in Appendix A of 14 CFR part 150.

Special consideration needs to be given to the evaluation of the significance of noise impacts on noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question. For example, the DNL 65 dB threshold does not adequately address the impacts of noise on visitors to areas within a national park or national wildlife and waterfowl refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.

When the proposed action or alternative(s) would result in a significant noise increase and the proposed action or any alternative is highly controversial on this basis, the EIS should include, as appropriate in light of the specific proposal under analysis, information on the human response to noise. Inclusion of data on background or ambient noise, as well as other noise in the area, may be helpful.

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<sup>6</sup> Day-Night Average Sound Level (DNL). The 24-hour average sound level, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between midnight and 7 a.m., and between 10 p.m., and midnight, local time. The symbol for DNL is  $L_{dn}$  (See 14 CFR § 150.7).

Compatible or non-compatible land use is determined by comparing the aircraft DNL values at a site to the values in the part 150 land use compatibility guidelines (see Exhibit 11-3). The part 150 guidelines include uses that may be protected under Section 4(f). The part 150 guidelines may be used to determine the significance of noise impacts on properties protected under Section 4(f) to the extent that the land uses specified in the guidelines bear relevance to the value, significance, and enjoyment of the lands in question. Special consideration needs to be given to noise sensitive areas within Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks, national wildlife and waterfowl refuges and historic sites, including traditional cultural properties) where the land use compatibility guidelines in 14 CFR part 150 are not relevant to the value, significance, and enjoyment of the area in question. For example, the part 150 land use categories are not sufficient to determine the noise compatibility of areas within a national park or national wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute, or to address noise impacts on wildlife. When instances arise in which aircraft noise is a concern with respect to wildlife impacts, established scientific practices, including review of available studies dealing with specific species of concern, should be used in the analysis. Noise impact studies of similar species, where similarity may be judged on physiological, phylogenetic, or ecological criteria, and published theories of noise impacts that pertain to these species should be used to obtain the best estimate of potential impacts. This estimate should be qualified by a discussion of the biological uncertainties that arise from gaps in theory and distinctions between the studied species and the affected species. With respect to historic sites, the FAA may rely upon the part 150 guidelines to determine noise impacts on historic properties that are in use as residences. However, the part 150 guidelines may not be sufficient to determine the impact of noise on historic properties where a quiet setting is a generally recognized purpose and attribute, such as a historic village preserved specifically to convey the atmosphere of rural life in an earlier era or a traditional cultural property.

If the noise and noise-compatible land use analysis concludes that there is no significant impact, usually a similar conclusion may be drawn with respect to land use in general. However, if the proposal would result in other impacts which have land use ramifications, for example, disruption of communities, relocation, or induced socioeconomic impacts, the impacts on land use should be analyzed in this context and described accordingly under the appropriate impact category (see Chapter 9, Land Use).

#### **11.4. Supplemental Noise Analysis**

The Federal Interagency Committee on Noise (FICON) report, “Federal Agency Review of Selected Airport Noise Analysis Issue,” dated August 1992, concluded that the DNL is the recommended metric and should continue to be used as the primary metric for aircraft noise exposure. Subsequent review has confirmed there are no new descriptors or metrics of sufficient scientific standing to substitute for the present DNL cumulative noise exposure metric. However, DNL analysis may optionally be supplemented on a case-by-case basis to characterize specific noise impacts. Because of the diversity of situations, the variety of supplemental metrics available, and the limitations of individual supplemental metrics, the FICON report concluded that the use of supplemental metrics to analyze noise should remain at the discretion of

individual agencies. Since 1992, the Federal Interagency Committee on Aviation Noise (FICAN)<sup>7</sup> has reaffirmed this recommendation.<sup>8</sup>

Supplemental noise analyses are most often used to describe aircraft noise impacts for specific noise sensitive locations or situations and to assist in the public's understanding of the noise impact. The selection of supplemental analyses will depend upon the circumstances of each particular project. In some cases, public understanding may be improved with a more complete narrative description of the noise events contributing to the DNL contours with additional tables, charts, maps, or metrics. In other cases, supplemental analyses may include the use of metrics other than DNL. There is no single supplemental methodology that is preferable in all situations and these metrics often do not reflect the magnitude, duration, or frequency of the noise events under study.

Exhibit 11-2 below describes metrics that have been used in developing supplemental noise analyses for a variety of reasons such as sleep disturbance, speech interference, building sound insulation, and analysis for special areas such as national parks.

**Exhibit 11-2. Potential Metrics for Supplemental Noise Analyses**

Metric	Description
Sound exposure level (SEL)	A single event metric that takes into account both the noise level and duration of the event, referenced to a standard duration of one second.
Maximum sound level ( $L_{max}$ )	A single event metric that is the highest A-weighted sound level measured during an event.
Equivalent sound level ( $L_{eq}$ )	A cumulative level of a steady sound level that provides an equivalent amount of sound energy for any specific period.
Time above (TA)	A time-based metric that gives the duration, in minutes, for which aircraft-related noise exceeds a specified A-weighted sound level during a given period.
Number Above	The total number of events where the noise exceeds a defined threshold level.
Time Audible	The duration that a time-varying sound level may be detected in the presence of ambient noise as audible by a human observer with normal hearing, who is actively listening for aircraft noise. This metric may be used, if appropriate, for projects within or involving national parks.

A comprehensive listing of acoustical terminology and definitions is available in the American National Standards Institute's (ANSI) "Acoustical Terminology" standard (ANSI S1.1-1994).

The type and nature of activity potentially impacted should be considered. The FICON report identified sleep disturbance and speech interference as two areas where it is appropriate to consider supplemental metrics. In the case of sleep disturbance the predicted number of awakenings in the United States may be calculated using the ANSI Noise Standard, ANSI S12.9-

<sup>7</sup> FICAN is the successor to FICON and was created in 1993.

<sup>8</sup> <http://www.fican.org/pages/fican.html>



2008/Part 6, Quantities and Procedures for Description and Measurement of Environmental Sound - Part 6: Methods for Estimation of Awakenings Associated with Outdoor Noise Events Heard in Homes. To examine speech interference (also used as a surrogate for children's learning), FICON recommended using a cumulative A-weighted metric that is limited to the affected time period hours or a Time-above analysis. Additionally, the FICON report provides a table that relates DNL to speech interference.

In addition, the FAA will consider use of appropriate supplemental noise analysis in consultation with the officials having jurisdiction over Section 4(f) properties (including, but not limited to, noise sensitive areas within national parks, national wildlife and waterfowl refuges, and historic sites including traditional cultural properties) where a quiet setting is a generally recognized purpose and attribute that the FAA identifies within the study area of a proposed action or alternative(s). Such supplemental noise analysis is not, by itself, a measure of adverse aircraft noise or significant aircraft noise impact. Lines of Business/Staff Offices (LOB/SOs) within the FAA must consult with and receive approval from AEE in determining the appropriate supplemental noise analysis for use in such cases.

Supplemental analyses may be accomplished using the various capabilities of AEDT for specific grid point analysis. Noise analyses can be used in combination with geographic information system (GIS) programs such as ArcGIS and the U.S. Census Topologically Integrated Geographic Encoding and Referencing (TIGER) databases to determine various population impacts within specified geographic areas.

## **11.5. Additional Noise Analysis Guidance**

### **11.5.1. Noise from On-Airport Sources Other Than Aircraft Departures and Arrivals**

For some noise analyses, it may be necessary to include noise sources other than aircraft departures and arrivals in the noise analysis. This can be determined by examining the action and determining the potential impacts caused by noise other than aircraft departures and arrivals. Some examples are engine run-ups, aircraft taxiing, construction noise, and noise from related roadway work and roadway noise. The inclusion of these sources should be considered on a case-by-case basis, as appropriate.

If engine run-ups or aircraft taxiing noise are analyzed as part of the study, an FAA-approved model must be used. If an alternative model or methodology is desired, prior AEE approval is needed (see Section 11.4 for details). If appropriate, an analysis of surface transportation impacts, including construction noise, should be conducted using accepted methodologies from the appropriate modal administration, such as the Federal Highway Administration (FHWA) for highway noise.

For information on facility and equipment noise impact emissions see Section 11.5.5 below. For noise associated with commercial space actions see Section 11.5.4 below.

### **11.5.2. 14 CFR Part 150 Noise Proposals**

If the proposal requiring an EA or EIS is the result of a recommended noise mitigation measure included in an FAA-approved part 150 noise compatibility program, the noise analysis developed in the program will normally be incorporated in the EA or EIS. The responsible FAA official must determine whether this is sufficient for EA or EIS noise analysis purposes.

### **11.5.3. Airport Actions**

For airport actions, documentation must be included to support the required airport sponsor's assurance under 49 U.S.C. § 47107(a)(10), formerly Section 511(a)(5) of the Airport and Airway Improvement Act of 1982, that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including takeoff and landing of aircraft. The assurance must be related to existing and planned land uses. The NEPA document should address what is being done by the jurisdiction(s) with land use control authority, including an update on any prior assurance.

The Airport Development Grant Program (see 49 U.S.C. § 47101) requires that a project may not be approved unless the Secretary of Transportation is satisfied that a project is consistent with plans (existing at the time a project is approved) of public agencies for development of the area in which the airport is located (see 49 U.S.C. § 47106(a)(1)).

FAA Advisory Circular 150/5020-1, *Noise Control and Compatibility Planning for Airports*, presents guidance for airport operators and planners to help achieve compatibility between airports and their environs.

*Guidance on Procedures for Evaluating the Potential Noise Impacts of Airport Improvement Projects on National Parks and Other Sensitive Park Environments* provides FAA regional offices and airport sponsors with appropriate methodology and procedures for evaluating proposed airport projects that could affect the sound environment of National Parks and other DOT Section 4(f) and cultural properties.

For airport actions, in addition to the guidance provided here, see FAA Order 5050.4B and the Environmental Desk Reference for Airport Actions available at: [http://www.faa.gov/airports/resources/publications/orders/environmental\\_5050\\_4/](http://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/).

### **11.5.4. Commercial Space**

If a project involves commercial space launch vehicles reaching supersonic speeds, the potential for sonic boom impacts should be discussed.<sup>9</sup>

### **11.5.5. Facility and Equipment Noise Emissions**

For facility and equipment noise emissions, the provisions of the Noise Control Act of 1972 (42 U.S.C. §§ 4901-4918), as amended, apply. State and local standards can be used as a guide for particular activities if these standards are at least as stringent as Federal standards. The Act's

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<sup>9</sup> Please note that part 91 prohibits supersonic flight for civil aircraft. Part 91, Appendix B provides guidance for applying for a special flight authorization to exceed Mach 1.

provisions apply to all land uses. Special attention should be given to noise sensitive areas in developing mitigation (e.g., scheduling machinery operations near hospitals).

## **11.5.6. Flight Standards**

### **11.5.6.1. Operations Specifications**

Flight Standards actions that are normally subject to EAs include the approval of operations specifications or amendments that may significantly change the character of the operational environment of an airport. The person responsible for approving the operations specifications is also responsible for assuring the EA is prepared. Thorough coordination among Flight Standards District Office (FSDO) personnel and the Regional Flight Standards Division is essential. Coordination among regions is expected if an action crosses regional boundaries or lines of businesses (LOBs).

In preparing a noise analysis, the FSDO personnel normally will collect information from the operator that includes the airport, types of aircraft and engines, number of scheduled operations per day, and the number of day/night operations. The information should also include the operator's long-range plans and operation assumptions that are sufficiently conservative to encompass reasonably foreseeable changes in operations.

If the carrier declines to furnish the information, or if the furnished information on operations at the airport does not realistically address night operations (in view of the carrier's proposal and pattern of activity at that airport), or if the information otherwise patently understates the potential operations (when compared with carrier's operations at other airports or with other carrier's operations at that airport), the responsible FAA official will develop an operational assumption which includes night operations and which is otherwise consistent with the typical operations of similar carriers at similar airports. This operational assumption will be used in the NEPA review after coordination with the affected air carrier. If the air carrier objects to the use of this operational assumption in the NEPA review, the carrier may specify that a lesser level of operations be used in the analysis, provided that the carrier agrees that this lesser level will serve as a limit on the operations specifications. If the carrier refuses such a limitation, the FAA will include all reasonably foreseeable operations in the analysis. In this situation, the NEPA document should state that the operational assumption was developed solely for the purpose of environmental analyses and that it is not to be viewed as a service commitment by the carrier.

If an EIS is required, the affected operator should be advised as soon as possible and should be requested to provide any additional required information. District Office personnel will coordinate, as necessary, any activity with the operator. The operations specifications will not be approved until all issues and questions associated with the EIS are fully resolved and the regional Flight Standards Division manager has concurred with the approval.

### **11.5.6.2. Aerobic Practice Areas**

Due to the unique nature of the practice routines used in aerobic practice areas (APA), the standard and default data in AEDT is not appropriate for use when modeling the noise consequences of the aircraft performing in the APA. For guidance on performing noise analysis for APAs, see the October 17, 2012 FAA guidance memorandum titled, "Approval of Aerobic Practice Area (APA) noise equivalent methodology" available at

[https://www.faa.gov/about/office\\_org/headquarters\\_offices/apl/environ\\_policy\\_guidance/guidance/media/Approval\\_for\\_APA\\_Equivalent\\_Methodology.pdf](https://www.faa.gov/about/office_org/headquarters_offices/apl/environ_policy_guidance/guidance/media/Approval_for_APA_Equivalent_Methodology.pdf).

## 11.6. Mitigation

Any mitigation measures that are in effect at the time of the proposal or are proposed to be taken to mitigate the action should be described in the NEPA document.

Local land use actions are within the purview of local governments. The FAA encourages local governments to take actions to reduce and prevent land uses around airports that are not compatible with airport operation and aircraft noise. Airports receiving grant funding have a compatible land use obligation, as described in Section 11.5.3, Airport Actions. The NEPA document should address what is being done regarding compatible land use by the jurisdiction(s) with land use control authority.

Common operational measures to mitigate noise include:

- preferential runway use; and
- noise abatement flight procedures.

Common mitigation measures related to noise and noise-compatible land use include:

- acquisition of land or land interests, including air rights, easements, and development rights, to ensure the use of property for purposes compatible with noise exposure;
- sound insulation of residences and other noise sensitive structures; and
- construction of noise barriers or acoustic shielding to mitigate ground-level noise.

Common construction mitigation measures include:

- use of proper mufflers for construction equipment; and
- measures to limit noise from machinery or trucks as they traverse streets in noise sensitive areas.

When a noise analysis in the immediate vicinity of an airport identifies noise sensitive areas that would have an increase of DNL 3 dB or more from DNL 60 dB up to DNL 65 dB noise exposure, the potential for mitigating noise in those areas should be considered, including consideration of the same range of mitigation options available at DNL 65 dB and higher and eligibility for Federal funding. This is not to be interpreted as a commitment to fund or otherwise implement mitigation measures in any particular area.<sup>10</sup>

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<sup>10</sup> Federal Interagency Committee On Noise: Federal Agency Review of Selected Airport Noise Analysis Issues (August 1992), page 3-7.

**Exhibit 11-3. Land-Use Compatibility\* with Yearly Day-Night Average Sound Levels**

Land Use	Yearly DNL Sound Level (decibels)					
	<65	65-70	70-75	75-80	80-85	>80
<b>Residential</b>						
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
<b>Public Use</b>						
Schools	Y	N (1)	N (1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental 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
<b>Commercial Use</b>						
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

Land Use	Yearly DNL Sound Level (decibels)					
	<65	65-70	70-75	75-80	80-85	>80
<b>Manufacturing and Production</b>						
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
<b>Recreational</b>						
Outdoor sports arenas and spectator sports	Y	Y (5)	Y (5)	N	N	N
Outdoor music shells, amphitheatres	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

**Source:** 14 CFR part 150, Appendix A, Table 1

**Note:** Numbers in parentheses refer to the notes at end of the exhibit.

\* The designations contained in this exhibit 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. The FAA determinations under 14 CFR 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.

Y = Land use and related structures compatible without restrictions

N = Land use and related structures are not compatible and should be prohibited

25 or 30 = Land use and related structures generally compatible; measures to achieve Noise Level Reduction of 25 or 30 dBA (i.e. a weighted sound level) must be incorporated into design and construction of structure. Noise Level Reduction is the amount of noise reduction in decibels achieved through incorporation of building sound insulation treatments (between outdoor and indoor levels) in the design and construction of a structure (14 CFR § 150.7). Building sound insulation treatments typically consist of acoustical replacement windows and doors.

- (1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor noise level reduction of at least 25 dBA and 30 dBA should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a noise level reduction of 20 dBA, thus, the reduction requirements are often stated as 5, 10 or 15 dBA over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of noise level reduction criteria will not eliminate outdoor noise problems.
- (2) Measures to achieve noise level reduction of 25 dBA 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 noise level reduction of 30 dBA 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 noise level reduction of 35 dBA 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 noise level reduction of 25 dBA.
- (7) Residential buildings require noise level reduction of 30 dBA.
- (8) Residential buildings not permitted.

## **12. Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks**

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This chapter covers socioeconomics (Section 12.1), environmental justice (Section 12.2), and children’s environmental health and safety risks (Section 12.3).

## 12.1. Socioeconomics

Socioeconomics is an umbrella term used to describe aspects of a project that are either social or economic in nature. A socioeconomic analysis evaluates how elements of the human environment such as population, employment, housing, and public services might be affected by the proposed action and alternative(s).

Section 1508.14 of the Council on Environmental Quality (CEQ) Regulations states that “economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.” Therefore, the requirement to prepare socioeconomic analysis in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is project specific and is dependent upon the existence of a relationship between natural or physical environmental effects and socioeconomic effects.

### 12.1.1. Regulatory Setting

Exhibit 12-1 lists the primary statute related to socioeconomic impacts. See Appendix B.8 for more detailed information about these requirements.

**Exhibit 12-1. Statute Related to Socioeconomic Impacts**

Statute	Location in U.S. Code	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary
Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970	42 U.S.C § 61 et seq.	49 CFR part 24	FHWA	This Act contains provisions that must be followed if acquisition of real property or displacement of people would occur as a result of implementing the selected alternative.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; FHWA= Federal Highway Administration

#### 12.1.1.1. Consultations, Permits, and Other Approvals

##### *Uniform Relocation Assistance and Real Property Acquisition Policies Act*

If acquisition of real property or displacement of persons is involved, 49 CFR part 24 (implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970), as amended, must be met for Federal projects and projects involving Federal funding. Otherwise, the FAA, to the fullest extent possible, observes all state and local laws, regulations, and ordinances concerning zoning, transportation, economic development, housing, etc. when planning, assessing, or implementing the proposed action or alternative(s). (This requirement

does not cover local zoning laws, set-back ordinances, and building codes because the Federal government is exempt from them).

### **12.1.2. Affected Environment**

For socioeconomics, the study area may be larger than the study area for other impact categories and should consider the impacts of the alternatives on the following broad indicators: economic activity, employment, income, population, housing, public services, and social conditions.

The responsible FAA official should consult with local transportation, housing and economic development, relocation and social agency officials, and community groups regarding the social impacts of the proposed action and alternative(s). The principal social impacts to be considered are those associated with relocation or other community disruption, transportation, planned development, and employment.

The baseline conditions should include the size of local population centers, the distance from a project site to these areas, and the nature of the local economies. U.S. Census, state, and local government data are often used to describe baseline socioeconomic characteristics. Other data sources include the following: state economic development agencies; local government agencies; chamber of commerce records; and private organizations that operate as data brokers. Private institutions may also post relevant data on websites or publish them in readily available formats.

The following indicators may be relevant when characterizing the baseline socioeconomic conditions within the affected environment:

#### **12.1.2.1. Economic Activity and Income**

The Bureau of Economic Analysis website at: <http://www.bea.gov/> provides regional and national information about gross domestic product and personal income. Understanding the incomes of individuals located in the study area will allow for a comparison between the current condition and projected impacts associated with the alternatives. In addition, information about state and local taxes can be found on local government websites. Each state's income, sales, and property tax rates will vary.

#### **12.1.2.2. Employment**

The Bureau of Labor Statistics website at: <http://www.bls.gov/> provides information on the labor force and various labor force characteristics including the current number of employed and unemployed persons within an area, consumer price indexes, productivity, and demographic characteristics of the labor force. This website can be used to collect information about the people working in the study area and their spending habits.

#### **12.1.2.3. Population and Housing**

The U.S. Census Bureau website at: <http://www.census.gov/> provides the results of the Decennial Censuses and American Community Survey, which include housing and population information. Census data may be particularly useful because the data are summarized at different geographic levels in descending order of size, including: national, state, county, census tracts, block group, and block. Because of the need to protect the privacy of individuals living within blocks, income data are available only as small as the block group level. The various

sizes of Census data available allow the most appropriate data to be selected for the specific study area.

#### 12.1.2.4. Public Services and Social Conditions

Depending on the location and scope of the alternatives, consult state, local, or county government resources to determine the public services and social conditions potentially impacted by a project. Detailed information regarding a community's educational institutions, medical services, and emergency response services is typically available from Federal, state, or county/municipal sources.

#### 12.1.3. Environmental Consequences

The principal social impacts to be considered are those associated with relocation or other community disruption, transportation, planned development, and employment. An example of a direct socioeconomic impact is the change in job availability caused when a new construction project is proposed in an area. The construction project may result in an increase in available jobs; however, these jobs may be temporary in nature and would cease to exist when construction is completed.

The specific types of socioeconomic impacts that would result from an alternative depend on the nature of the alternative. Exhibit 12-2 provides examples of the types of socioeconomic impacts that may be considered for the alternatives. Whether or not the various potential impact areas should be discussed will depend on what the action is and whether the potential socioeconomic impacts are interrelated with or inseparable from a physical or natural environmental effect.

**Exhibit 12-2. Socioeconomic Impacts that May be Considered**

Potential Impact Area	What to Analyze
Economic Activity	Consider the effects of the alternatives on the reduction or increase of economic activity in the study area.
Employment	Determine the impacts of the alternatives on employment in the study area. Analyze indicators such as current unemployment rates, commuter patterns, and the existing labor force. Consider these factors in conjunction with implementation of the alternatives.
Income	Analyze current information on per capita income, median household income, and rates of poverty for individuals in the study area and consider how the alternatives would change the existing conditions.
Population	Determine the impacts of the alternatives on current population and projected population growth rates in the study area. Consider the impact of a project on the potential for people to migrate to or leave the area.
Housing	Consider the effects of the alternatives on the availability of housing, both temporary and permanent, in the study area. Research the available housing units and determine if a project would cause an increase or decrease in the demand for housing.

Potential Impact Area	What to Analyze
Public Services	Determine the effects of the alternatives on the availability of public services to those in the study area. Consider factors such as an increase or decrease in water usage, transportation, medical, rescue, education, or utility services as a result of a project.
Social Conditions	Analyze the social conditions, to the extent practicable, in the study area. Consider how the alternatives would impact factors such as community cohesion and religious institutions.

In cases where relocation is involved, the environmental document should provide:

- estimates of the numbers and characteristics of individuals and families to be displaced;
- the impact on the neighborhood and housing to which relocation is likely to take place; and
- an indication of the ability of that neighborhood to provide adequate relocation housing for the families to be displaced.

The environmental document should also include a description of special relocation advisory services to be provided, if any, for the elderly, handicapped, or illiterate regarding interpretation of benefits or other assistance available.

If an insufficient supply of generally available relocation housing is indicated, a thorough analysis of efforts made to remedy the problem should be reflected in the document. This includes, if necessary, a provision for housing of last resort as authorized by Section 206(a) of the Uniform Relocation Assistance and Real Property Acquisition Policies Act. If business relocation would cause appreciable economic hardship on the community, if significant changes in employment would result directly from the action, or if community disruption is considered substantial, the environmental document should include a detailed explanation of the impacts and the reasons why significant impacts cannot be avoided.

When the analysis indicates substantial induced or secondary impacts attributable to the proposal, a detailed analysis of such impacts should be included in the document. As pertinent and to the extent known or reasonably foreseeable, such factors as impacts on regional growth and development patterns, and spin-off jobs created should be described.

#### **12.1.3.1. Significance Determination**

In general, the significance of socioeconomic impacts is determined by the magnitude and duration of the impacts, whether beneficial or adverse. The FAA has not established a significance threshold for socioeconomics in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts for socioeconomics (see Exhibit 4-1 of FAA Order 1050.1F). Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts.

Factors to consider that may be applicable to socioeconomic resources, if they are interrelated with natural or physical environmental impacts (see 40 CFR § 1508.14), include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area);
- Disrupt or divide the physical arrangement of an established community;
- Cause extensive relocation when sufficient replacement housing is unavailable;
- Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities;
- Disrupt local traffic patterns and substantially reduce the levels of service of roads serving an airport and its surrounding communities; or
- Produce a substantial change in the community tax base.

#### **12.1.4. Mitigation**

Examples of potential measures to mitigate socioeconomic impacts that may be appropriate for the alternatives include the following:

- Try to compensate for or reduce any detrimental impacts the proposed action or alternative(s) may have caused to the economic health of the study area. This could include providing relocation assistance to local business owners in accordance with the Uniform Relocation Act; and
- Provide a financial payment and/or relocation assistance to renters and people who are displaced from their homes as required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

### **12.2. Environmental Justice**

Environmental justice is 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. *Fair treatment* means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. *Meaningful Involvement* means that:

- people have an opportunity to participate in decisions about activities that may affect their environment and/or health;
- the public's contribution can influence the regulatory agency's decision;
- their concerns will be considered in the decision making process; and
- the decision makers seek out and facilitate the involvement of those potentially affected.

Requirements for meaningful public involvement by minority and low-income populations are addressed in Paragraph 2-5.2.b of FAA Order 1050.1F. As stated in the Order, the FAA must provide for meaningful public involvement by minority and low-income populations. In accordance with DOT Order 5610.2(a), this public involvement must provide an opportunity for

minority and low income populations to provide input on the analysis, including demographic analysis, that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse. The public involvement process can also provide information on subsistence patterns of consumption of fish, vegetation, or wildlife. This information should be disclosed to potentially affected populations for proposed actions and alternative(s) that are likely to have a substantial effect and for Comprehensive Environmental Response, Compensation, and Liability Act sites.

### 12.2.1. Regulatory Setting

Exhibit 12-3 lists the primary statutes, Executive Orders, and other guidance related to environmental justice impacts. See Appendix B.9 for more detail on these requirements.

**Exhibit 12-3. Statutes, Executive Orders, and Other Guidance Related to Environmental Justice**

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Title VI of the Civil Rights Act of 1964, <a href="#">as amended</a>	42 U.S.C §§ 2000d-2000d-7	28 CFR § 42.401	DOJ	Title VI of the Civil Right Act of 1964 states that “No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” Title VI explicitly prohibits any discrimination in Federally funded programs and projects, including those sponsored by the FAA.
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations	59 <i>Federal Register</i> 7629, (February 11, 1994)	Not applicable	EPA	Requires Federal agencies to incorporate environmental justice into their planning processes.
Memorandum of Understanding on Environmental Justice and Executive Order 12898 (August 4, 2011)	Not applicable	Not applicable	Not applicable	The participating Federal agencies (which includes the FAA) agree to declare the continued importance of identifying and addressing environmental justice considerations in their programs, policies, and activities as provided in Executive Order 12898.

Statute or Executive Order	Location in U.S. Code or Federal Register	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
DOT Order 5610.2(a), Environmental Justice in Minority and Low-Income Populations	77 <i>Federal Register</i> 27534, (May 10, 2012)	Not applicable	DOT	Establishes principles for integrating environmental justice into current policies and practices.
CEQ Guidance: “Environmental Justice: Guidance Under the National Environmental Policy Act” (December 10, 1997)	Not applicable	Not applicable	CEQ	Outlines how environmental justice could be considered in NEPA documents.
Revised Department of Transportation Environmental Justice Strategy	77 <i>Federal Register</i> 18879 (March 28, 2012)	Not applicable	DOT	This Strategy responds to the requirements of the MOU on Environmental Justice and Executive Order 12898 discussed above.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; EPA= U.S. Environmental Protection Agency; DOJ= U.S. Department of Justice; MOU = Memorandum of Understanding

### 12.2.1.1. Consultations, Permits, and Other Approvals

#### *Executive Order 12898 and DOT Order 5610.2(a)*

Executive Order 12898 encourages the consideration of environmental justice impacts in EAs, especially to determine whether a disproportionately high and adverse impact may occur. When the FAA determines that a project has significant impacts in any environmental impact category, the potential for disproportionately high and adverse effects on minority or low-income populations must be examined pursuant to DOT Order 5610.2(a). Even in the absence of a finding of significant impact in another environmental impact category, further inquiry into the potential for disproportionately high and adverse effects on minority or low-income populations may be warranted based upon the demographics of the study area and the nature of environmental impacts associated with the proposed project. If there are disproportionately high and adverse effects on minority or low-income populations, DOT Order 5610.2(a) requires that certain procedures be followed for analyzing the proposed action’s potential impacts, offsetting benefits, potential alternatives, and substantial need. The FAA reflects its adherence to the requirements of DOT Order 5610.2(a) in its NEPA document.

#### *Title VI of the Civil Rights Act*

Under Title VI, the FAA is required to ensure that no person, on the ground of race, color, or national origin, is excluded from participation in, denied the benefits of, or subjected to discrimination under any program or activity receiving Federal financial assistance. The Title VI requirements are broader in scope than environmental justice and apply to all Federally-funded

projects and activities, not solely those which may have adverse human health or environmental effects on communities.

### 12.2.2. Affected Environment

The combination of all study areas for the other relevant impact categories represents the potential impact area for environmental justice, because environmental justice impacts may be realized in conjunction with impacts to any other impact category.

The description of the affected environment for the NEPA document should describe the minority and low-income populations located within the identified study area. The environmental document should include demographic information about the affected populations and include information about the populations that have an established use for the significantly affected resource, or to whom that resource is important (i.e., subsistence fishing).

Exhibit 12-4 presents the definitions from DOT Order 5610.2(a) that may be used to help identify potential environmental justice populations in the study area.

#### Exhibit 12-4. Definitions from DOT Order 5610.2(a) to Identify Status of Environmental Justice Populations

Term	Definition
Minority	A person who is: <ol style="list-style-type: none"> <li>1. Black: a person having origins in any of the black racial groups of Africa;</li> <li>2. Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;</li> <li>3. Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent;</li> <li>4. American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America) and who maintains cultural identification through tribal affiliation or community recognition; or</li> <li>5. Native Hawaiian and Other Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.</li> </ol>
Minority Population	Any readily identifiable group of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity.
Low-Income	A person whose median household income is at or below the Department of Health and Human Services poverty guidelines. <sup>a</sup>
Low-Income Population	Any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed DOT program, policy or activity.

Source: DOT Order 5610.2(a)

<sup>a</sup> These guidelines can be found on the U.S. Department of Health and Human Services website located at <http://www.hhs.gov/>.



The following methods may be used to help find information about potential environmental justice populations in the study area:

- To calculate the total **minority population** in an area, determine the population of non-Hispanic Whites through the Census Bureau's American Community Survey website at: <http://www.census.gov/acs/www/> and then subtract that population from the total population for the study area. The populations of different minority groups cannot simply be added together because they could inadvertently count an individual twice. For example, people may choose to report more than one race to indicate their racial mixture, such as "American Indian" and "White."
- To determine the total **low-income population** in the study area, consider the percentage of individuals in the study area whose median household income is at or below the Department of Health and Human Services poverty guidelines (to access these guidelines, refer to the Department's homepage at: <http://aspe.hhs.gov/poverty/index.cfm>. Additionally, transient or temporary workers that may not have been captured in the Department of Health and Human Services data in this calculation should be considered. This data can be found through sources such as the Department of Labor's National Agricultural Worker's Survey, and through data collected by town, city, and county governments in the vicinity of the proposed action and alternative(s).

Although DOT Order 5610.2(a) directs DOT agencies, including the FAA, to identify low-income populations using the Department of Health and Human Services poverty guidelines, CEQ and U.S. EPA guidance references the U.S. Census Bureau's annual statistical poverty thresholds on income and poverty (Series P-60) to define low income. The Department of Health and Human Services poverty guidelines and the Census Bureau's poverty threshold differ slightly. The responsible FAA official should use the Department of Health and Human Services poverty guidelines as directed in DOT Order 5610.2(a). CEQ's environmental justice guidance may be drawn upon, as appropriate, after the requirements of DOT Order 5610.2(a) have been met.

### 12.2.3. Environmental Consequences

An environmental justice analysis considers the potential of Federal actions to cause disproportionately high and adverse effects on low-income or minority populations.

DOT Order 5610.2(a) provides the following definition for the types of adverse impacts that should be considered when assessing impacts to environmental justice populations:

Adverse effects means the totality of significant individual or cumulative human health or environmental effects, including interrelated social and economic effects, which may include, but are not limited to: bodily impairment, infirmity, illness, or death; air, noise, and water pollution and soil contamination; destruction or disruption of man-made or natural resources; destruction or diminution of aesthetic values; destruction or disruption of community cohesion or a community's economic vitality; destruction or disruption of the availability of public and private facilities and services; vibration; adverse employment effects; displacement of persons, businesses, farms, or nonprofit organizations; increased traffic congestion, isolation, exclusion, or separation of minority or low-income individuals within a given community or from the broader community;

and the denial of, reduction in, or significant delay in the receipt of, benefits of DOT programs, policies, or activities.

### **12.2.3.1. Determining Disproportionately High and Adverse Effects**

The NEPA document should clearly describe the methodology used to determine if there are adverse impacts that disproportionately affect environmental justice populations. This includes providing results of analysis to determine if a low income or minority population using a resource sustains more of the impact than any other population segment.

DOT Order 5610.2(a) provides the following definition for a “disproportionately high and adverse impact” that should be used when assessing impacts to environmental justice populations:

*Disproportionately high and adverse effect on minority and low-income populations* means an adverse effect that:

1. Is predominately borne by a minority population and/or a low-income population; or
2. Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

DOT Order 5610.2(a) indicates that mitigation and enhancement measures and offsetting benefits can be taken into consideration when determining if there are disproportionately high and adverse effects from a project.

### **12.2.3.2. Significance Determination**

The FAA has not established a significance threshold for environmental justice in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts for environmental justice (see Exhibit 4-1 of FAA Order 1050.1F). Please note that these factors are not intended to be a threshold. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. The factors to consider that may be applicable to environmental justice include, but are not limited, to a situation in which the proposed action or alternative(s) would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to:

- Significant impacts in other environmental impact categories; or
- Impacts on the physical or natural environment that affect an environmental justice population in a way that the FAA determines is unique to the environmental justice population and significant to that population.

Note that not all “adverse impacts” within the meaning of DOT Order 5610.2(a) will meet or exceed a significance threshold in another environmental impact category. Some adverse impacts may not be significant impacts in another environmental impact category as defined by Exhibit 4-1 in FAA Order 1050.1F, yet they may be a significant impact when examined in the context of their effects on minority or low-income populations. As a result, the responsible FAA official must undertake a case-by-case analysis of an action’s unique facts. The responsible FAA

official does this to determine if impacts not otherwise rising to a level of significance for NEPA purposes nonetheless represent disproportionately high and adverse effects, and/or a significant impact for environmental justice purposes. Examples of impacts that may not be significant impacts in another environmental impact category, but may be considered significant impacts when examined in the context of environmental justice include:

- Water resource impacts and/or biological resource impacts that are not considered significant standing alone, but may be significant when considered in the context of subsistence fishing or game consumption by environmental justice communities.
- Special cultural traditions associated with traditional cultural sites of Indian tribes increase sensitivity to aircraft overflights. In such locations, overflights may produce levels of noise that represent disproportionately high and adverse effects and significant impacts under NEPA even though noise levels associated with such overflights would not otherwise be considered significant.

#### **12.2.4. Mitigation**

Any potential adverse impacts that affect minority or low-income populations should be identified early in the planning process so action can be taken to prevent them. Environmental justice impacts may be avoided or minimized through early and consistent communication with the public and allowing ample time for public coordination. In addition to including public outreach efforts as part of the NEPA process, it may also be beneficial to include the public in identifying possible mitigation measures. In *“Environmental Justice: Guidance Under the National Environmental Policy Act,”* CEQ emphasizes the community’s role in mitigation efforts, stating that efforts should reflect the needs of affected low-income, minority, or tribal populations.

In cases where the FAA finds a significant impact, but determines that mitigation would reduce that impact below the applicable significance threshold, the environmental document should describe how mitigation would reduce the impact to less than significant levels and verify that a project would not result in disproportionately high and adverse effects on low income and minority populations.

### **12.3. Children’s Environmental Health and Safety Risks**

Pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks* 62 *Federal Register* 19885, (April 21, 1997), Federal agencies are directed, as appropriate and consistent with the agency’s mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. The FAA is encouraged to identify and assess environmental health risks and safety risks that the agency has reason to believe could disproportionately affect children. Environmental health risks and safety risks include risks to health or to safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they might use or be exposed to.

The Task Force on Environmental Health Risks and Safety Risks to Children, created by Executive Order 13045, identified four priority areas of impacts to children for immediate attention:

- asthma,
- unintentional injuries,
- developmental disorders (including lead poisoning), and
- cancer.

For more information on the Task Force on Environmental Risks and Safety Risks to Children, see EPA's website for Children's Health Protection at: <http://www2.epa.gov/children>.

Impacts to children are considered separately in NEPA reviews because children may experience a different intensity of impact as compared to an adult exposed to the same event. For example, children's internal organs are still developing and they are therefore unable to process exposure to toxic substances in the same way that an adult can. Children are also more likely to exhibit behaviors that put them at a greater risk for exposure to hazards. Children under age 5 are more susceptible than adults to environmental hazards due to the fact they are more heavily exposed to toxins in proportion to their body weight. Children under age 5 breathe more air, drink more water, and eat more food per unit of body weight than adults do, so they may experience higher rates of exposure to toxins, pollutants, and pathogens. Children between ages 5 and 18 may face higher risks of exposure to hazardous chemicals due to their growing participation in activities outside of the home.

### 12.3.1. Regulatory Setting

Exhibit 12-5 lists the Executive Order related to children's environmental health and safety risks. See Appendix B.8 for more detail on Children's Environmental Health and Safety Risks.

**Exhibit 12-5. Executive Order Related to Children's Environmental Health and Safety Risks**

Executive Order	Location in <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency	Summary
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	62 <i>Federal Register</i> 19885, (April 23, 1997)	Not applicable	Not applicable	This Executive Order directs Federal agencies to analyze their policies, programs, activities, and standards for any environmental health or safety risks that may disproportionately affect children. Included in these categories are risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, water, recreational waters, soil, or products they might use or be exposed to.

### **12.3.1.1. Consultations, Permits, and Other Approvals**

There are typically no formal required Federal consultation processes, permits, or other approvals related to children's environmental health and safety risks.

### **12.3.2. Affected Environment**

The affected environment for potential impacts for children's environmental health and safety is related to the affected environment for other impact categories (i.e., air quality, noise, etc.). Therefore, the study area for children's environmental health and safety should include the study areas identified for other impact categories that have the potential to impact children's environmental health and safety.

To identify how many children live in the area and how old they are, the Census Bureau collects data on children that can be accessed through their Fact Finder at: <http://factfinder2.census.gov/main.html>.

In addition to determining the number and age of children in the study area, also it may be beneficial to determine the number of schools, daycares, parks, and children's health clinics in the study area. Local websites and reports can be helpful in identifying these resources. Detailed information regarding a community's educational institutions, medical services, and emergency response services is typically available from Federal, state, or county/municipal sources.

The FAA should consider whether the proposed action or alternative(s) would create new or exacerbate existing adverse impacts to children in any of the priority areas identified by the Task Force.

### **12.3.3. Environmental Consequences**

Similar to environmental justice, impacts to children's health and safety in the context of other impact categories should be considered.

#### **12.3.3.1. Significance Determination**

The FAA has not established a significance threshold pertaining to impacts to children's environmental health and safety in FAA Order 1050.1F; however, the FAA has identified a factor to consider when evaluating the context and intensity of potential environmental impacts for children's environmental health and safety (see Exhibit 4-1 of FAA Order 1050.1F). Please note that this factor is not intended to be a threshold. If this factor exists, there is not necessarily a significant impact; rather, the FAA must evaluate this factor in light of context and intensity to determine if there are significant impacts.

The factor to consider that may be applicable to children's environmental health and safety includes, but is not limited to, situations in which the proposed action or alternative(s) would have the potential to lead to a disproportionate health or safety risk to children.

**12.3.4. Mitigation**

The mitigation measures appropriate to minimize or eliminate potential adverse impacts could be the same as the mitigation measures identified for other impact categories with the potential to impact children's environmental health and safety (i.e., air, water, etc.), although in some situations unique mitigation measures specific to children may be identified.

## 13. Visual Effects

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Visual effects deal broadly with the extent to which the proposed action or alternative(s) would either: 1) produce light emissions that create annoyance or interfere with activities; or 2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment. Visual effects can be difficult to define and assess because they involve subjectivity. Proposed aviation and aerospace actions do not commonly result in adverse visual effects, but these effects may occur in certain circumstances. For clarity and uniformity, visual effects are broken into two categories: 1) *Light Emission Effects*; and 2) *Visual Resources and Visual Character*. These two categories are defined in more detail below and should be discussed separately in a NEPA document.

Visual effects on resources discussed in other sections of a NEPA document (e.g., Section 106, Section 4(f)), should be discussed in those sections, and cross-referenced in this section. In those cases, the NEPA document need not include a detailed discussion of affected environment and environmental consequences in the visual effects section.

Visually-protected coastal areas, rivers protected under the Wild and Scenic Rivers Act, sensitive wildlife species, and Section 106, Section 4(f), and Section 6(f) properties can be located within or near a project area and could be affected by light emissions and/or changes to visual resources and the visual character. There is overlap between other impact categories and visual resources, because resources covered under other impact categories are among the elements that make up our visual environment. The visual impacts of the proposed action and alternative(s) should be discussed in detail under those appropriate impact categories, as follows:

- Chapter 2 – *Biological Resources* (for impacts to sensitive wildlife species);
- Chapter 4 – *Coastal Resources*;
- Chapter 5 – *Department of Transportation Act, Section 4(f)*;
- Chapter 8 – *Historical, Architectural, Archeological, and Cultural Resources* (for impacts to Section 106 properties); and
- Chapter 14, Section 14.5 – *Wild and Scenic Rivers*.

These items may be briefly discussed or touched upon in the Visual Effects section of a NEPA document to acknowledge their visual significance, with reference provided to the sections that contain the more detailed discussion, as necessary, to avoid duplicate analysis. Coordination between the various sections may be required to ensure that adequate analysis is provided across all impact categories.

### Light Emissions

*Light emissions* include any light that emanates from a light source into the surrounding environment. Examples of sources of light emissions include airfield and apron flood lighting, navigational aids, terminal lighting, parking facility lighting, roadway lighting, safety lighting on launch pads, additional lighting to support nighttime commercial space launches, and light generated from such launches. Glare is a type of light emission that occurs when light is reflected off a surface (e.g., window glass, solar panels, or reflective building surfaces).

### Visual Resources and Visual Character

*Visual resources* include buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics. Visual resources may include structures or objects that obscure or block other landscape features. In addition, visual resources can include the cohesive collection of various individual visual resources that can be viewed at once or in concert from the area surrounding the site of the proposed action or alternative(s). In unique circumstances, the nighttime sky may be considered a visual resource.

*Visual character* refers to the overall visual makeup of the existing environment where the proposed action and alternative(s) would be located. For example, areas in close proximity to densely populated areas generally have a visual character that could be defined as urban, whereas less developed areas could have a visual character defined by the surrounding landscape features, such as open grass fields, forests, mountains, or deserts, etc.

## 13.1. Regulatory Setting

**Exhibit 13-1. Statutes Related to Visual Effects**

Statute	Location in U.S. Code	Implementing Regulation(s)	Oversight Agency	Summary
Not applicable	Not applicable	Not applicable	Not applicable	There are no special purpose laws or requirements for visual effects.

Some visual resources are protected under Federal, state, or local regulations. Protected visual resources generally include, but are not limited to, Federal, state, or local scenic roadways/byways; Wild and Scenic Rivers; National Scenic Areas; scenic easements; trails protected under the National Trails System Act or similar state or local regulations; biological resources; and features protected under other Federal, state, or local regulations.

Although there are no Federal special purpose laws or requirements specific to light emissions and visual effects, there are special purpose laws and requirements that may be relevant. In addition to NEPA, laws protecting resources that may be affected by visual effects include



Section 106 of the National Historic Preservation Act (NHPA), Section 4(f) of the DOT Act, the Wild and Scenic Rivers Act, the Coastal Zone Management Act, and state and regional coastal protection acts. Visual resources are also protected and managed on Federal resource lands, such as under U.S. Forest Service Resource Management Plans and the Bureau of Land Management Visual Resource Management System. In addition, there may be state and local regulations, policies, and zoning ordinances that apply to visual effects.

### **13.1.1. Consultations, Permits, and Other Approvals**

There are typically no formal required Federal consultation processes, permits, or other approvals related to visual effects. Although there are no specific consultation requirements, informal coordination with other Federal, state, tribal, and local agencies and the public may be helpful in determining the nature and extent of potential visual effects from the proposed action and alternative(s).

## **13.2. Affected Environment**

The affected environment for light emissions should be addressed separately from that for visual resources and visual character effects. In cases where the visual resources in, and/or the visual character of, a project area could be affected by light emissions, this should be discussed in both the light emissions discussion and the visual resources and visual character effects discussion.

### **13.2.1. Light Emissions**

People, wildlife, and land uses that could be affected by light emissions from the proposed action and alternative(s) should be considered, including the extent to which they are currently affected by existing light emissions. A general discussion of the current level of light emissions, including glare, coming from aviation/aerospace related, and non-aviation/aerospace related sources in a project area (e.g., residential developments, roadway lighting) should be included to establish baseline conditions. Also, the unique resources of the area that could be affected by light emissions and unique characteristics of the area should be considered. Characteristics to consider include such things as the presence or absence of existing sources of light, vegetation that screens or filters light and glare, and urban sources of light. Unique resources may include both protected and unprotected visual resources. Historic properties, parks, traditional cultural properties, and light-sensitive wildlife species should be discussed in detail in the appropriate impact category section, but should also be mentioned briefly under this header (see discussion in introduction above).

### **13.2.2. Visual Resources and Visual Character**

Potentially affected visual resources and the visual character within the study area should be discussed to establish baseline conditions. The aesthetic value and any unique aspects of the area, including any protected visual resources, should be considered and discussed. In determining the existence of unprotected visual resources, input from the community is important. More detailed information about such properties should be provided in the appropriate visual effects section (see discussion in introduction above).

### 13.3. Environmental Consequences

To the extent that visual effects are relevant to other impact categories (e.g., light emission impacts on biological resources, including migratory birds and marine mammals; properties protected under Section 4(f); and historic properties under Section 106 of the NHPA), those impacts should be discussed in the relevant sections of the NEPA document and cross-referenced in this section, as appropriate. Where impacts related to visual resources and visual character would only be due to light emissions, the discussion of those impacts should be presented under the light emissions heading.

Appropriate design factors should be discussed with respect to the degree to which they would offset any visual impacts. Examples of design factors at airports and commercial launch sites include:

- decorative lighting fixtures, and lighting that is shielded to reduce light emissions; and
- new facilities or major terminal expansions that recognize and are compatible with an area's notable architectural, cultural, or ethnic assets through architecture, design, and/or landscaping.

Public involvement and consultation with appropriate Federal, state, local agencies and tribes may help determine the extent of visual impacts. Consider state and local regulations, policies, and zoning ordinances that protect against light and visual annoyances, and the extent to which the proposed action and alternative(s) would conflict with such regulations. For example, obstructions of historical properties, land features of importance, and man-made monuments may be regulated under state or local requirements that need to be considered.

#### 13.3.1. Light Emissions

Light emission impacts are typically related to the extent to which any lighting or glare associated with the proposed action or alternative(s) would create an annoyance for people in the vicinity and/or would interfere with their normal activities, including work and recreation. The light emissions that would be created by the proposed action and alternative(s) should be compared to baseline conditions to determine if there is a potential for annoyance and adverse impacts. Include consideration of whether nighttime construction activities would cause substantial increases in light or require lighting that would cause annoyance or disrupt normal activities.

When the potential for annoyance exists, information should be included in the analysis such as the location of lights or light systems, pertinent characteristics of the lighting (e.g., intensity, flashing sequence for strobe lighting, and color) and its intended use (e.g., security lighting, runway lighting), and mitigation measures that could be implemented to lessen any annoyance, such as shielding or angular adjustments. If helpful, a map can be included that shows the locations of homes and other light-sensitive sites in the affected environment relative to the proposed lighting system. If there is the potential for significant impacts, the responsible FAA official should consider whether a special lighting study is warranted.

Unique situations may require special analysis, such as:

- Native American traditional cultural places, protected tribal resources, and Indian sacred sites that may be affected by light emissions;

- unique areas that are valued for dark skies where light emissions would be substantially increased; and
- light-sensitive biological resources in the area, including migratory birds and marine mammals.

### **13.3.2. Visual Resources and Visual Character**

Visual resources and visual character impacts are typically related to a decrease in the aesthetic quality of an area resulting from development, construction, or demolition. Analysis of visual impacts considers whether the proposed action and alternative(s) would affect, obstruct, substantially alter, or remove visual resources including buildings, historic sites, or other landscape features, such as topography, water bodies, or vegetation, that are visually important or have unique characteristics. When the potential to obstruct a visual resource exists, information should be included in the analysis such as how a project would alter the character and quality of views and the number of locations from which the resource can be viewed. Visual impacts that affect historical and cultural resources can also be relevant in the NHPA Section 106 review (see Chapter 8). The visual sight of aircraft and commercial space launch vehicles, aircraft and commercial space launch vehicle contrails, or aircraft lights at night, particularly at a distance that is not intrusive, should not be assumed to constitute an adverse effect.

The proposed action and alternative(s) may complement or contrast with the area's visual character. The degree of any contrast should be evaluated. Contrast would not always necessarily cause an adverse effect (i.e., it could have an only mildly discernible effect or a positive effect on the aesthetics of the area). Additionally, where the existing visual character of a project area is not unique or visually important, any contrast with the proposed action and alternative(s) would be less likely to create an adverse effect. Consider if design arts (e.g. architectural design) could lessen any adverse impacts.

### **13.3.3. Significance Determination**

The FAA has not established a significance threshold for visual effects in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts for visual effects (see Exhibit 4-1 of FAA Order 1050.1F). Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to visual effects include, but are not limited to:

- Light Emissions Effects
  - The degree to which the action would have the potential to create annoyance or interfere with normal activities from light emissions; and
  - The degree to which the action would have the potential to affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.

- Visual Resources and Visual Character Effects
  - The degree to which the action would have the potential to affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
  - The degree to which the action would have the potential to contrast with the visual resources and/or visual character in the study area; and
  - The degree to which the action would have the potential to block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

### **13.4. Mitigation**

Common operational mitigation measures related to visual effects include:

- Light Emissions:
  - Shielding/baffles to reduce light emissions; and
  - Angular adjustments.
- Visual Resources and Visual Character:
  - Project modifications that would reduce the adverse impacts of visual encroachments into residential or recreational areas; and
  - The application of design, art, architecture, and landscape architecture to visually enhance an infrastructure project or obscure potentially intrusive or adverse visual impacts.

## 14. Water Resources

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Water resources are surface waters and groundwater that are vital to society; they are important in providing drinking water and in supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems. Surface water, groundwater, floodplains, and wetlands do not function as separate and isolated components of the watershed, but rather as a single, integrated natural system. Disruption of any one part of this system can have consequences to the functioning of the entire system. The analysis should include not only disruption of the resources but also potential impacts to the quality of the water resources. Because of the close and integrated relationship of these resources, their analysis is conducted under the all-encompassing impact category of water resources. Wild and Scenic Rivers are included because impacts to these rivers can result from obstructing or altering the free-flowing characteristics of a designated river, an impact more closely resembling an impact to a water resource. This chapter covers the following main topics: wetlands (Section 14.1), floodplains (Section 14.2), surface waters (Section 14.3), groundwater (Section 14.4), and Wild and Scenic Rivers (Section 14.5).

## 14.1. Wetlands

For regulatory purposes under the Clean Water Act (CWA), the term wetlands means areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Areas covered with water for such a short time that there is no effect on moist-soil vegetation are not considered wetlands, nor are the waters of streams, reservoirs, and deep lakes. Wetlands provide many benefits to the human, biological, and hydrological environment, including habitat for fish and wildlife, water quality improvement, flood storage, and opportunities for recreation.

### 14.1.1. Regulatory Setting

Exhibit 14-1 lists the statutes, regulations, Executive Orders, and other requirements related to wetlands. See Appendix B.9.1 for more detailed information about these requirements.

#### Exhibit 14-1. Statutes, Regulations, Executive Orders, and Other Requirements Related to the Protection of Wetlands

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Executive Order 11990, Protection of Wetlands	42 <i>Federal Register</i> 26961, (May 24, 1977)	Not applicable	DOT	Requires Federal agencies to “avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.” The stated purpose of this Executive Order is to “minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.”
Clean Water Act	33 U.S.C. §§ 1251-1387	33 CFR parts 320-332 40 CFR parts 230-233	USACE; EPA	The CWA establishes the basic structure for regulating the discharge of pollutants into waters of the United States which include wetlands. The two primary sections of the CWA relating to wetland impacts and permitting are Section 404 and Section 401.  Section 404 establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Section 401 requires that a Water Quality Certificate for a project to ensure it does not violate State or Tribal water quality standards.

Statute or Executive Order	Location in U.S. Code or Federal Register	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
				Section 401 certifications are generally issued by the state or tribe with jurisdictional authority.
Fish and Wildlife Coordination Act	16 U.S.C § 661-667d	Final regulations never issued	USFWS	Requires Federal agencies to consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed Federal or applicants' projects may result in control or modification of the water of any stream or other water body (including wetlands).
DOT Order 5660.1A, Preservation of the Nation's Wetlands	Not applicable	Not applicable	DOT	Implements the guidelines set forth in Executive Order 11990. Transportation facilities should be planned, constructed, and operated in order to assure the protection and enhancement of wetlands to the fullest extent practicable.
State statutes protecting wetlands	Not applicable	Not applicable	Applicable state	In addition to the Federal requirements discussed above, there may be additional state and local wetland statutes and regulations that apply to the proposed project. This should be determined on a case-by-case basis by contacting relevant state and local regulatory agencies in the early stages of project planning.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; USACE= U.S. Army Corps of Engineers; EPA = U.S. Environmental Protection Agency; USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service.

A water of the United States is considered a jurisdictional surface water or wetland under the CWA; the regulatory definition is found at 33 CFR § 328.3(a), and further guidance is found in the EPA/USACE Memorandum "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*." Any surface water not meeting this definition is considered non-jurisdictional, and therefore has no statutory protection under the CWA. It is important to note that not all surface waters are considered jurisdictional under the CWA. This determination is made on a case-by-case basis by the USACE; as a result, the FAA should consult with the USACE to determine the jurisdictional status of any surface water that may be affected by a proposed action or alternative(s). Non-jurisdictional wetlands are protected under Executive Order 11990.



#### 14.1.1.1. Consultations, Permits, and Other Approvals

Early coordination of the proposed action and alternative(s) will be conducted with agencies with special interest in wetlands. Such agencies include state and local natural resource and wildlife agencies, USFWS, NMFS, the U.S. Coast Guard (USCG), the USACE, the U.S. Department of Agriculture (USDA) Wildlife Services, and the EPA, as appropriate. This coordination may be combined as much as possible with the state and local officials. Specific consultation is required under the Fish and Wildlife Coordination Act with the USFWS and the state agency having administration over the wildlife resources.

If there is uncertainty about whether an area is a wetland, the local district office of the USACE or a wetland delineation specialist must be contacted for a delineation determination (or the USDA Natural Resources Conservation Service (NRCS) to delineate wetlands on agricultural lands).

Early coordination among the FAA or applicant, the USFWS, NMFS, and the USACE may assist the FAA in addressing wetland issues or conflicts early in the NEPA process and in developing ways to resolve them. If a proposed project would have an unavoidable impact to a wetland that is determined to be jurisdictional by the USACE under the CWA, the following permit and certification will be required.

#### *Section 404 Permit*

Section 404 of the CWA authorizes the USACE to issue permits, after the notice and opportunity for public hearing, for the discharge of dredged or fill material into the waters of the United States.

Under Section 404, no discharge of dredged or fill material can be permitted if a practicable alternative exists that avoids or minimizes wetland impacts. Therefore, when the FAA or applicant applies for a permit it must show and explain that it has:

- taken steps to avoid wetland impacts where practicable;
- minimized potential impacts to wetlands; and
- provided compensation for any remaining, unavoidable impacts through activities to restore or create wetlands.

For many discharges that have minimal impacts, the USACE can grant *general permits*. General permits are issued on a nationwide, regional, or state basis for particular categories of activities (e.g., minor road crossings, culvert replacement) as a means to expedite the permitting process. General permits typically cover multiple facilities within that specific category and offer a cost-effective option for the USACE because of the large number of facilities that can be covered under a single permit. By definition, general permits have already been issued and have gone through the NEPA process. A common and widely used general permit is the *Nationwide Permit*, which is a permit that has already been issued nationwide for certain specified activities. If a proposed project would have unavoidable wetland impacts, it would benefit the FAA or applicant to design a project to meet the conditions of a Nationwide Permit. Nationwide Permits are reviewed and revised every five years by the USACE, and the current Nationwide Permits became effective on March 19, 2012.

For projects with potentially significant adverse wetland impacts or those projects exceeding the criteria for a general permit, an *individual permit* is usually required. The time to process an

individual permit varies depending on the complexity of a project and the USACE district issuing the permit. Standard individual permits typically require a 30-day agency and public review, and can then take 60 to 120 days or more to process and issue the permit. As a result, the preparation of a Section 404 permit application package should begin in the early stages of project planning. Exhibit 14-2 presents a summary of the Section 404 permit process.

#### **Exhibit 14-2. Process for Obtaining a Section 404 Permit**

<b>Step</b>	<b>Action</b>
1	<p>The FAA or applicant determines if the proposed project would discharge dredged or fill material into the waters of the United States, including wetlands. If not, a Section 404 permit is not required.</p> <p>If so, contact the USACE district office to schedule a pre-application consultation meeting. One or several meetings are scheduled for consultation between the FAA or applicant, USACE district staff, interested resource agencies (Federal, state, tribal, or local), and sometimes the interested public. The basic purpose of the meeting(s) is to provide for informal discussions about the pros and cons of a proposal before an applicant makes irreversible commitments of resources (funds, detailed designs, etc.). The process is designed to provide the applicant with an assessment of the viability of some of the more obvious alternatives available to accomplish a project purpose, to discuss measures for reducing the impacts of a project, and to inform the applicant of the factors the USACE must consider in its decision-making process.</p>
2	<p>If it is determined that the USACE has jurisdiction and a permit is needed, the FAA or applicant submits a permit application.</p>
3	<p>Once a complete application is received, the formal review process begins.</p> <p>USACE districts operate under what is called a project manager system, where one individual is responsible for handling an application from receipt to final decision. The USACE project manager prepares a public notice (within <b>15 days</b> of receiving all permit information). The public notice describes the permit application, including the proposed activity, its location, and potential environmental impacts. The public notice invites comments within a specified time (typically <b>15 to 30 days</b> depending on the proposed activity).</p>
4	<p>The application and comments are reviewed by the USACE and other interested Federal, state, and tribal agencies, organizations, and individuals.</p> <p>The USACE negotiates necessary modifications of a project if required, and drafts or oversees drafting of appropriate documentation to support a recommended permit decision.</p>
5	<p>The USACE issues a permit decision document that includes a discussion of the environmental impacts of a project, the findings of the public interest review process, and any special evaluation required by the type of activity.</p> <p>No permit is granted if the proposal is found to be contrary to the public interest.</p>

In the Memorandum of Agreement (MOA) between DOT and the Department of the Army on Section 404 permit processing,<sup>1</sup> there is a provision for elevating permit applications with the Department of the Army. When an Army District Engineer proposes to deny a permit or condition one that would cause substantial, unacceptable conditions to the DOT agency, the responsible FAA official shall advise the appropriate FAA program office in Washington, D.C. That office will provide whatever follow-up action may be necessary at the Headquarters level to resolve the differences.

### ***Integrating Section 404 Compliance and NEPA***

Note that it is not necessary to complete the Section 404 permit process to complete the NEPA process, although it would be beneficial to the process. Additionally, completing the permit process does not mean the NEPA process is complete. Sometimes the FAA or applicant applies for a Section 404 permit for projects requiring dredge or fill activities in jurisdictional wetlands after the NEPA document has been approved. There are benefits, however, to developing the permit application earlier in the process. Time savings and reduced controversy may outweigh the extra effort required to address Section 404 considerations as an integral part of the NEPA process. When the two processes are integrated effectively, the USACE's approval of the permit can be concurrent with or closely follow the FAA's approval. The USACE can be made a cooperating agency or the USACE may adopt the FAA's final NEPA document when making a 404 permit decision, thereby avoiding the need to prepare additional NEPA documents. For further information, see the CWA Regulations at 33 CFR parts 320 and 325 and the Council on Environmental Quality (CEQ) Regulations at 40 CFR § 1500.2.

### ***Section 401 Water Quality Certification***

Before the USACE can issue a Section 404 permit, a Section 401 water quality certification must first be obtained from the State in which the proposed action is to occur. In most cases, Section 401 certification reviews are conducted at the same time as Section 404 permit reviews, as many states have established joint permit processes to ensure this occurs.

### ***State and Local Permits and Certifications***

In addition to the Federal requirements, there may be additional state and local wetland statutes and regulations that apply to the proposed project. This should be determined on a case-by-case basis by contacting relevant state and local regulatory agencies in the early stages of project planning. Some states may have a joint application process with the USACE for wetland permitting.

### ***Executive Order 11990, Protection of Wetlands, and DOT Order 5660.1A, Preservation of the Nation's Wetlands***

For unavoidable wetland impacts, the FAA should make a written *finding* to comply with Executive Order 11990, *Protection of Wetlands*, 42 *Federal Register* 26961, (May 24, 1977) and DOT Order 5660.1A, *Preservation of the Nation's Wetlands*. Section 2(a) of the Executive

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<sup>1</sup> MOA issued by DOT, U.S. Environmental Protection Agency (EPA) and the Department of the Army entitled *Implementation of the Intermodal Surface Transportation Efficiency Act* (May 1, 1992). This MOA made the 1985 document entitled "Applying the Section 404 Permit Process to Federal-aid Highway Projects" better known as the "Red Book" official policy for DOT, EPA, and U.S. Army Corps of Engineers (USACE).

Order states “each agency, to the extent permitted by law, shall avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds (1) that there is no practicable alternative to such construction, and (2) that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. In making this finding the head of the agency may take into account economic, environmental and other pertinent factors.” This finding must be made in the Finding of No Significant Impact (FONSI) or Record of Decision (ROD) and documentation necessary to support the finding must be contained in the NEPA document.

For projects involving leases, easements, rights-of-way, or disposal from Federally-owned wetlands or portions of them, to a non-Federal public or private party, the following should be done to comply with Paragraph 7.e of DOT Order 5660.1A:

- Ensure the conveyance references those uses restricted by identified Federal, state, or local wetland regulations;
- Attach any appropriate restrictions on how the grantee or property purchaser and any successor may use the properties, except where prohibited by law; or
- Withhold the properties from disposal.

Executive Order 11990 and DOT Order 5660.1A also direct agencies to provide the public an opportunity for early public review of any plan or proposal that would involve new construction in a wetland.

Executive Order 11990 and DOT Order 5660.1A do not apply to the issuance by Federal agencies of permits, licenses, or allocations to private parties for activities involving wetlands on non-Federal property.

### **14.1.2. Affected Environment**

The wetland study area should be defined as the area with the potential to be either directly or indirectly affected by the proposed project. For example, construction of a new facility can directly impact wetlands through direct loss of wetland area and function within the construction footprint of an alternative. Construction of a facility upstream from a wetland along a stream could also indirectly affect the wetland by changing the quantity or quality of water that flows downstream to the wetland area.

If there is uncertainty about whether an area is a wetland, the local district office of the USACE or a wetland delineation specialist must be contacted for a delineation determination (or the USDA NRCS to delineate wetlands on agricultural lands). The NEPA document should include information on the location, types, and extent of wetland areas that might be affected by the proposed action and alternative(s). This information can be obtained from Federal, state, or local natural resource agencies.

Publicly available Geographic Information System (GIS) data and maps can be helpful when determining the potential presence of wetlands in the study area. In particular, the USFWS National Wetlands Inventory (NWI) is a national mapping database of wetland types and locations. However, these maps can be inaccurate and are not as reliable as a field delineation conducted to determine the presence of wetlands. In addition, state and local agencies may also have wetland maps that can be used as a supplemental source to the NWI maps. The appropriate agency (USFWS or USACE) may be consulted for guidance on identifying potential wetlands in

the study area. NWI data can be obtained from the USFWS website at: <http://www.fws.gov/wetlands>.

The presence of wetlands is best determined by visiting a project site to conduct a field delineation to determine if wetlands are present. Field delineations should be conducted by a qualified wetland delineation specialist who can evaluate the proposed site's physical, hydrologic, and biological characteristics to determine if any areas are present in the affected environment that meet a regulatory definition of a wetland. Such delineations should follow the *Corps of Engineers Wetland Delineation Manual* (Technical Report Y-87-1), which is the standard used by the USACE for purposes of determining the presence of wetlands as defined by USACE CWA implementing regulations.<sup>2,3</sup>

If, by using the NWI, consulting with state or local agencies, or using a qualified wetland delineator, it is determined that wetlands are present in the study area, a map should be included in the NEPA document that shows the wetland area(s) in relation to the location of the proposed project.

### 14.1.3. Environmental Consequences

After the affected environment has been adequately described, evaluate the potential environmental consequences of the alternatives on all wetlands identified within the study area.

If the proposed action and alternative(s) are not within the limits of or would not affect a wetland, a statement to that effect should be made and no further analysis is needed. If the only practicable alternative would impact wetland areas, then further environmental analysis is needed. Begin by characterizing any fill, excavation, or construction of structures that would have the potential to affect wetlands and wetland function.

For unavoidable wetland impacts, different types of impacts to wetlands should be considered, including any direct and indirect impacts that would result from the construction and operation of the proposed project. Wetland impacts can result from draining, dredging, channelizing, filling, diking, impounding, or related activities conducted for the construction of structures or facilities. All areas where permanent infrastructure would be built, and locations where temporary construction-related activity might

*Wetland functions* are the processes that take place within a wetland. Functions wetlands provide can include:

- Flood storage and protection,
- Water quality improvement,
- Shoreline stabilization,
- Groundwater recharge, and
- Fish and wildlife habitat.

These processes have value for the wetland itself, for surrounding ecosystems, and for people.

Functions can be grouped broadly as habitat, hydrologic, or water quality functions.

<sup>2</sup> The USACE delineation manual requires that positive indicators of a wetland be present for the following three parameters to meet the definition of a wetland: 1) hydrophytic vegetation, 2) hydric soil, and 3) hydrology.

<sup>3</sup> It should be noted that some Federal agencies, including USFWS and the National Park Service, define wetlands on lands under their jurisdiction more broadly than the definition and delineation manual used by the USACE of Engineers for CWA Section 404 purposes. Therefore, wetlands on these Federal lands may not always be subject to the CWA, but are subject to wetland protection orders, directives, and regulations of that agency.

occur (such as equipment lay-down, staging, and building of temporary access roads) must be considered for potential direct construction-related impacts to wetlands. In particular, when considering unavoidable impacts to wetlands, any impact that would affect or alter the physical condition or function of a wetland should be considered (see text box), including the action's overall effect on the survival and quality of the remaining wetlands after project implementation.

Various wetland functional assessments have been developed to describe how a wetland's hydrology, vegetation, and soil perform functions related to water quality, hydrology, and habitat. For example, construction within a wetland could lead to loss of a wetland function such as natural flood control, resulting in increased flooding in the vicinity of the proposed project. Alternately, the creation of a new impermeable surface such as a runway could lead to increased run-off, which could affect water quality in nearby wetlands. In turn, an alteration in water quality could affect the habitat and wildlife that use the wetland. As a result, the impact analysis should consider the variety of indirect impacts that could result from losses in wetland function.

If the action would affect wetlands and there is a practicable alternative that avoids the wetland, this alternative becomes the environmentally preferred alternative, provided there are no other overriding environmental impacts. The NEPA document should state that the original project would have affected wetlands, but selection of the practicable alternative enabled the applicant to avoid the wetlands.

If the proposed action or alternative(s) would affect wetlands and there is no practicable alternative, all practical means should be employed to minimize the wetland impacts due to runoff, construction, sedimentation, land use, or other reasons. The NEPA document must contain a description of proposed mitigation measures, with the understanding that a detailed mitigation plan must be developed to the satisfaction of the 404 permitting agency in consultation with those agencies having an interest in the affected wetland.

For any action which entails new construction located in wetlands and to which, Executive Order 11990 and DOT Order 5660.1A apply, the FAA must make a specific *finding* (see Section 14.1.1). Also, it should be determined if wetland impacts would fall under the terms and conditions of a Section 404 general permit, such as a Nationwide Permit. These pre-approved permits have already gone through the NEPA process and have been determined to not have significant adverse impacts to jurisdictional wetlands.

#### **14.1.3.1. Significance Determination**

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for wetlands. A significant impact would occur when:

*The action would:*

- 1. Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers;*
- 2. Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;*
- 3. Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public);*
- 4. Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;*

5. *Promote development of secondary activities or services that would cause the circumstances listed above to occur; or*
6. *Be inconsistent with applicable state wetland strategies.*

Other agencies having expertise in wetland impacts may provide information and expertise for the FAA to use when it determines whether unavoidable wetland impacts are significant. As a result, appropriate agencies such as the USACE, EPA, USFWS, NMFS, NRCS (if wetlands are on agricultural lands), and state and local natural resource or wildlife agencies should be coordinated with in the early stages of project planning. If wetland impact occurs on tribal lands, consultation with tribal natural resource and wildlife representatives should occur before making a significance determination.

#### **14.1.4. Mitigation**

Some possible measures to mitigate impacts to wetlands include avoidance and minimization and compensatory mitigation, as discussed below.

##### **14.1.4.1. Avoidance and Minimization**

- Changes in the design, construction, or operation of the proposed project to avoid wetland impacts;
- Construction of a run-off collection system to prevent direct discharges to sensitive wetland areas;
- Use of infrastructure to treat or store waste materials; or
- Use of special construction controls, such as culverts, that help to maintain water flow.

Steps to avoid or minimize wetland impacts must be taken prior to proposing compensatory mitigation. If avoidance and minimization efforts are not sufficient to eliminate wetland impacts, compensatory mitigation may be necessary.

##### **14.1.4.2. Compensatory Mitigation**

The FAA also promotes wetland banking as a mitigation tool for projects that must occur in wetlands. Wetland banking provides a way to mitigate wetland impacts before they occur, by allowing the FAA or applicant to purchase wetland bank credits from an approved wetland mitigation bank.<sup>4</sup> The purchase of wetland bank credits serves as a payment to the wetland banker for the wetland mitigation services that the bank provides.

The purchase of credits from an approved bank can typically be used to satisfy the permit-required mitigation obligations needed to proceed with a proposed project that would have unavoidable wetland impacts. If the FAA or applicant and the relevant permitting agency agree that wetland banking is suitable mitigation for unavoidable wetland impacts, the NEPA document should contain a copy of any agreement related to the use of a wetland bank.<sup>5</sup> This

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<sup>4</sup> However, before approving use of a wetland bank for FAA projects, the FAA must ensure the bank would not cause or enhance wildlife hazards to aviation.

<sup>5</sup> For further information about mitigation banking, see the *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*, 60 *Federal Register* 58605, (November 28, 1995).

agreement should verify the following facts about the specific number of credits bought in the bank<sup>6</sup>:

- (1) The bank will meet defined wetland success criteria;
- (2) A specific number of credits will be withdrawn from the bank's total credit allotment to compensate for action-related impacts;
- (3) The applicant's purchase of these credits satisfies some or all of its wetland mitigation requirements for the proposed project; and
- (4) The mitigation will not create or worsen wildlife hazards to aviation.

If a wetland bank is not feasible for compensation of unavoidable wetland loss, wetland impacts should be mitigated by another method, such as wetland restoration, enhancement, establishment, or preservation. Under CWA implementing regulations, the preferred method by the USACE and EPA is wetland restoration, because the likelihood of mitigation success is much greater. For additional information on USACE and EPA regulations that govern compensatory mitigation for impacts to jurisdictional wetlands, see *Compensatory Mitigation Losses for Aquatic Resources*, 73 *Federal Register* 19594-19705, (April 10, 2008) at: [http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation\\_index.cfm#regs](http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation_index.cfm#regs)

To see the complete text of FAA's wetland mitigation banking strategy, see FAA Airports Environmental Program: Environmental Policy and Guidance Resources website at: [http://www.faa.gov/airports/environmental/policy\\_guidance/media/wetland\\_banking.pdf](http://www.faa.gov/airports/environmental/policy_guidance/media/wetland_banking.pdf).

The 2003 MOA between the FAA and the U.S. Air Force, U.S. Army, EPA, USFWS, and the USDA improves agency cooperation on wetland mitigation that may cause aircraft-wildlife strikes. The MOA can be found at: [http://www.faa.gov/airports/environmental/media/wildlife\\_hazard\\_mou\\_2003.pdf](http://www.faa.gov/airports/environmental/media/wildlife_hazard_mou_2003.pdf).

## 14.2. Floodplains

Floodplains are lowland areas adjoining inland and coastal waters which are periodically inundated by flood waters, including flood-prone areas of offshore islands. Floodplains are often discussed in terms of the *100-year flood*. The 100-year flood is a flood having a 1 percent chance of occurring in any given year. The 100-year flood is also known as the *base flood*. Floodplains are valued for their natural flood and erosion control, enhancement of biological productivity, and socioeconomic benefits and functions.

When property in floodplains is proposed for lease, easement, right-of-way, or disposal to non-Federal public or private entities, the FAA must, in accordance with Executive Order 11988, *Floodplain Management*: (1) reference in the conveyance those uses that are restricted under identified Federal, state, or local floodplain regulations; (2) attach other appropriate restrictions to uses of properties by the grantee or purchaser and any successors, except where prohibited by law; or (3) withhold such properties from conveyance.

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<sup>6</sup> The U.S. Army Corps/ EPA joint regulations on compensatory mitigation include mitigation banking, as well as other forms of compensatory mitigation. See EPA website on *Compensatory Mitigation* available at: [http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation\\_index.cfm#regs](http://water.epa.gov/lawsregs/guidance/wetlands/wetlandsmitigation_index.cfm#regs) (last updated: September 11, 2013; Accessed: November 18, 2013).



### 14.2.1. Regulatory Setting

Exhibit 14-3 lists the statutes, regulations, Executive Orders, and other requirements that may be relevant to floodplains. See Appendix B.9.2 for more detailed information about these requirements.

#### Exhibit 14-3. Statutes, Regulations, Executive Orders, and Other Requirements Related to the Protection of Floodplains

Statute or Executive Order	Location in U.S. Code or <i>Federal Register</i>	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Executive Order 11988, Floodplain Management	42 <i>Federal Register</i> 26951, (May 25, 1977)	Not applicable	DOT	Requires Federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.
National Flood Insurance Act	42 U.S.C § 4001 et seq.	44 CFR part 60	FEMA	Established the NFIP, a voluntary floodplain management program for communities (cities, towns, or counties), and implemented by FEMA. Any action within a FEMA-mapped floodplain in a participating community must follow the community's FEMA-approved floodplain management regulations.
DOT Order 5650.2, Floodplain Management and Protection	Not applicable	Not applicable	DOT	Implements the guidelines set forth in Executive Order 11988, <i>Floodplain Management</i> , 42 <i>Federal Register</i> 26951, (May 25, 1977). States that DOT agencies should ensure that proper consideration is given to avoid and mitigate adverse floodplain impacts in agency actions, planning programs, and budget requests.
State and local statutes protecting floodplains	Not applicable	Not applicable	Applicable states and municipalities	In addition to the Federal requirements discussed above, there may be additional state and local floodplain statutes and regulations that apply to the proposed project. This should be determined on a case-by-case basis by contacting relevant state and local regulatory agencies in the early stages of project planning.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; FEMA = Federal Emergency Management Agency; NFIP = National Flood Insurance Program

### 14.2.1.1. Consultations, Permits, and Other Approvals

Any proposed project taking place in a FEMA-mapped floodplain must follow the participating community's FEMA approved floodplain management plan, if such a plan exists. Early consultation with FEMA, USACE, or the NFIP participating community may assist the FAA in addressing floodplain issues or conflicts early in the NEPA process and in developing ways to resolve them.

#### *Executive Order 11988 and DOT Order 5650.2 Requirements*

To comply with Executive Order 11988, *Floodplain Management*, 42 *Federal Register* 26951, (May 25, 1977) and DOT Order 5650.2, *Floodplain Management and Protection*, all FAA actions must avoid floodplains if a practicable alternative exists; if no practicable alternative exists, actions in a floodplain must be designed to minimize adverse impacts to the floodplain's natural and beneficial values. If the proposed action or alternative(s) involves a *significant encroachment* in a floodplain, the FAA should issue a written *finding* that the proposed significant encroachment is the only practicable alternative. As defined in DOT Order 5650.2, significant encroachment is an encroachment in a floodplain that results in one or more of the following construction or flood-related impacts: 1) considerable probability of loss of human life, 2) likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility, and 3) a notable adverse impact on "natural and beneficial floodplain values." The FAA must provide the finding within or together with a NEPA document.

Executive Order 11988 and DOT Order 5650.2 also direct agencies to provide the public an opportunity for early public review of any plan or proposal that would encroach on the base floodplain. This ensures the public has an early opportunity to review a proposal in the base floodplain, even if the proposal does not require an EIS. The FAA may use the NEPA process to meet the public notification requirements for an action encroaching on a floodplain.

### 14.2.2. Affected Environment

The study area for floodplains should be defined as the entire geographic area with the potential to be either directly or indirectly affected by the proposed project, and not merely the area immediately adjacent to the action. For example, construction of a new facility can directly impact a floodplain through direct loss of floodplain area within the construction footprint of the proposed project. Construction of a facility in a floodplain could also reduce floodplain capacity in a system, indirectly affecting upstream and downstream flood flow volumes or raising flood elevations.

As part of the NFIP, FEMA established a mapping system to delineate floodplain areas within the United States. To determine if there are floodplains in the study area, first determine if a FEMA Flood Insurance Rate Map (FIRM) is available for the study area (see FEMA publication No. 258, *How to Use a Flood Map to Determine Flood Risk for a Property* for additional information on interpreting FIRMs). If a FIRM is not available, a FEMA Flood Hazard Boundary Map (FHBM), Flood Insurance Study, can also be used or the USACE, FEMA, or state or local floodplain management agencies can be contacted for help in determining the presence of floodplains in the study area. Please see FEMA's Map Service Center website at: <http://www.msc.fema.gov/> to find a FIRM or FHBM in the study area.

If floodplains are identified in the study area, a map should be included which shows the locations of the floodplain(s) in relation to the location of the proposed project.

If the proposed action and alternative(s) are not within the limits of, or on land adjacent to, a floodplain, a statement to that effect should be made and no further analysis is needed.

### **14.2.3. Environmental Consequences**

After the study area has been adequately described, the potential environmental consequences of the proposed action and alternative(s) on all floodplains identified within the study area should be evaluated.

Impacts to floodplains must be considered, including any direct and indirect impacts that result from the construction and operation of the proposed project. Activities such as building an airport, commercial space launch site, or any modification such as grading of the land, could have an impact on floodplains. All areas where permanent infrastructure would be built, and locations where temporary construction-related activity might occur (such as equipment lay-down, staging, and building of temporary access roads) must be considered for potential direct construction-related impacts. Additionally, all indirect impacts on floodplains within the study area should be identified. Actions outside a base floodplain may also adversely affect natural and beneficial floodplain resources. Consider impacts on natural and beneficial floodplain values, water pollution, increased runoff from impermeable surfaces, changes in hydrologic patterns, or induced development, where appropriate.

If the only practicable alternative requires siting in the base floodplain, a floodplain encroachment would occur and further environmental analysis is needed, as specified in DOT Order 5650.2. Any action located in the base floodplain constitutes a floodplain encroachment. If a floodplain encroachment does occur then the FAA must determine if it is a significant floodplain encroachment as detailed below.

#### **14.2.3.1. Floodplain Encroachment**

a. NEPA documents must cover the items below for all alternatives involving encroachments:

- (1) Any risk to, or resulting from, the transportation action;
- (2) The impacts on natural and beneficial floodplain values; and
- (3) The degree to which the action provides direct or indirect support for development within the base floodplain.

b. NEPA documents must also include sufficient discussion to permit an initial review of the adequacy of methods proposed to minimize harm, and, where practicable, to restore and preserve the natural floodplain values affected. In most cases, conceptual design should be sufficient to help establish the adequacy of mitigation measures. Commitments to later compliance with special flood-related design criteria or the imposition, in advance, of protective conditions may be warranted in some situations.

c. Final NEPA documents identifying a preferred alternative must clearly identify the floodplain concerns and impacts associated with that alternative and cover the items listed above.

### 14.2.3.2. Significant Floodplain Encroachment under DOT Order 5650.2

If the proposed action or alternative(s) includes an encroachment in a floodplain, the responsible FAA official must determine whether there would be significant floodplain encroachment based on the intensity of the encroachment and its impacts on the floodplain's natural and beneficial values. A significant floodplain encroachment under DOT Order 5650.2 is defined as an encroachment resulting in one or more of the following construction or flood related impacts: (1) a considerable probability of loss of human life; (2) likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility; and (3) a notable adverse impact on "natural and beneficial floodplain values." A significant floodplain encroachment is not necessarily a significant environmental impact under NEPA, as explained below.

**a. Assessing impacts on human life and transportation facilities.** Part of the significant encroachment definition in DOT Order 5650.2 includes impacts on human life and substantial encroachment-related costs or damage. This includes interruption of service on or loss of a vital transportation facility (e.g., runway, taxiway, air navigation facilities (NAVAID) damage, etc.). These factors should seriously be weighed as part of a project consideration; however, they alone do not trigger a significant environmental impact for NEPA purposes. The CEQ Regulations at 40 CFR § 1508.14 state that "...economic or social effects, are not intended by themselves to require preparation of an environmental impact statement." The FAA need not prepare an EIS for an action that does not have significant *environmental* impacts. When a significant encroachment involves a high likelihood of loss of human life or substantial encroachment-related costs or damage, the responsible FAA official should ensure the environmental evaluation includes specific information addressing the proposed action's floodplain aspects. The document should include information showing that the approving FAA official has thoroughly considered the impacts on human life and substantial encroachment-related costs and damage that would occur due to the proposed action's floodplain location. The document should answer questions such as:

- (1) Would flooding affect airport or facility access roads thereby preventing people from entering or exiting the area;
- (2) Would flooding affect aviation safety and the airport or facility's use? To make this determination, address the loss or temporary shutdown of a facility (e.g., lighting, hangars, runways, taxiways, NAVAIDS, etc.). This discussion might address flood impacts on the airport or facility's ability to serve regional or national aviation demands, and the economic well-being of aviation-related businesses. For example, flood-induced closing of or damage to a runway at a major hub could disrupt regional passenger or cargo movements and adversely affect the area's economy; and
- (3) Would flooding cause flood-induced spills of hazardous material stored at the airport or facility and their impacts on human populations?

**b. Impacts to a floodplain's natural and beneficial values.** Floodplains often support important ecological values benefiting the human and natural environment. Examples include a floodplain's capacity to: carry and store floodwaters; sustain agriculture, aquaculture, or aquatic or terrestrial organisms; provide for groundwater recharge; provide recreation opportunities; or maintain water quality. Note that indirect impacts on floodplains (such as an increase in the

amount of impervious surface in the watershed) could also substantially reduce the floodplain's capacity to sustain these values.

**c. Factors to consider when assessing impacts on a floodplain's natural and beneficial values.** The responsible FAA official should use the following information in conjunction with other information in the NEPA document addressing specific resources when determining the intensity of impacts.

- (1) Agricultural activities. Floodplains are often valued due to their level topography and their fertile substrates. Would the proposed action or alternative(s) erode or contaminate floodplain substrate, thereby reducing the floodplain's agricultural value?
- (2) Aquacultural activities. Due to their need for constant water supplies and specific water quality requirements, aquacultural activities often occur in or near floodplains. Would the proposed action or alternative(s) disrupt any of these activities?
- (3) Aquatic or terrestrial organisms. Numerous aquatic and terrestrial species occupy floodplains due to their food, cover, and water. Would the proposed action or alternative(s) disrupt the floodplain's ability to provide needed food, cover, or water requirements needed to sustain the organisms?
- (4) Flood control. Due to their expanse and obstructions, floodplains often slow flows or retain water, thereby lessening the probability of upstream or downstream flooding. Would the proposed action or alternative(s) cause flow alterations that result in unacceptable upstream or downstream flooding?
- (5) Groundwater recharge. Waters flowing through floodplains often flow more slowly allowing water to seep through surface cracks and recharge aquifers. Would the proposed action or alternative(s) adversely affect aquifer recharge capabilities?
- (6) Water quality. The natural flow of water over rough surfaces, through vegetation, and the natural biological and chemical processes found in floodplains reduce pollutant loads helping to maintain water quality. Would the proposed action or alternative(s) disrupt the floodplain's capacity to maintain desired water quality standards?

The analysis should discuss any risk to, or resulting from, the proposed action and alternative(s), the impacts on natural and beneficial floodplain values, the degree to which the proposed action and alternative(s) provide direct or indirect support for development in the floodplain, and measures to minimize harm or to restore or preserve the natural and beneficial floodplain values affected by a project. In addition, to ensure FAA compliance with DOT Order 5650.2, the FAA should ensure that all practicable alternatives outside the base floodplain are evaluated.

#### **14.2.3.3. Floodplain Finding**

The FAA may not select or approve a preferred alternative involving a significant floodplain encroachment, unless the responsible FAA official can make a written finding that:

- there is no practicable alternative to placing a project in the floodplain and that all measures to minimize harm will be included in a project;

- the proposed action must be located in the floodplain, including a discussion of the alternative(s) and why they were not practicable; and
- the action conforms to applicable state and/or local floodplain protection standards.

The NEPA document must contain a discussion of the factors and alternatives considered in reaching this finding. The NEPA document should explain that the FAA analyzed other alternatives and why locating the action in the floodplain is the only practicable alternative. A determination that a given action outside of a floodplain is or is not practicable requires a careful balancing and application of individual judgment. While such balancing should include the full range of environmental, social, economic, and engineering considerations, special weight should be given to floodplain management concerns. The responsible FAA official should support this finding with the following information in the NEPA document's floodplain section:

- A description of why the proposed action must be located in the floodplain, including a discussion of the alternative(s) and why they were not practicable;
- Each alternative considered, important factors the FAA considered regarding the only practicable alternative, and factors that make other alternatives impractical;
- Measures to minimize potential floodplain harm; and
- If NFIP criteria (44 CFR § 60.3) are applicable to the action.

The FAA must provide the above finding, within or together with a final NEPA document prepared for the proposed action, to state and area-wide clearinghouses and other interested parties.

#### **14.2.3.4. Public Review**

Section 2(a)(4) of Executive Order 11988 and Paragraph 7 of DOT Order 5650.2 require agencies to provide the public an opportunity for early public review of *any* plan or proposal that would encroach on the base floodplain. The FAA must provide the public with an opportunity to review the encroachment through its public involvement process. The FAA may use the NEPA process to meet the public notification requirements for an action encroaching on a floodplain. Any public notices, notices of opportunity for public hearing, public hearing notices, and notices of NEPA document availability must state that an encroachment is anticipated. If the encroachment is a significant floodplain encroachment, that must be clearly indicated in these public involvement processes. The FAA's notice of availability of a FONSI or notice of an EIS will include appropriate floodplain encroachment notification.

#### **14.2.3.5. Significance Determination**

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for floodplains. Floodplain impacts would be significant if: *The action would cause notable adverse impacts on natural and beneficial floodplain values.* Natural and beneficial floodplain values are defined in Paragraph 4.k of DOT Order 5650.2, *Floodplain Management and Protection.*

#### **14.2.4. Mitigation**

If no practicable alternative avoids floodplains, the FAA or applicant must incorporate mitigation measures into the proposed project in order to minimize potential harm to or within floodplains.

Mitigation may include:

- elevating facilities above the base flood elevation;
- minimizing fill placed in floodplains;
- construction controls to minimize erosion and sedimentation;
- designing the facility to allow adequate flow circulation and preserve free, natural drainage;
- committing to comply with special flood-related design criteria;
- using pervious surfaces where practicable;
- controlling run-off, while ensuring the run-off control measure does not attract wildlife hazardous to aviation; or
- controlling waste and spoils disposal to prevent contaminating ground and surface water, while not attracting wildlife hazardous to aviation (e.g., controlling the use of pesticides and herbicides, maintaining vegetative buffers to reduce sedimentation and delivery of chemical pollutants to the water body).

### 14.3. Surface Waters

Surface waters include streams, rivers, lakes, ponds, estuaries, and oceans. Note that this section discusses how to conduct the analysis for surface waters that is not otherwise captured in the wetlands, floodplains, groundwater, or Wild and Scenic Rivers sections.

#### 14.3.1. Regulatory Setting

Exhibit 14-4 lists the statutes, regulations, and other requirements that may be relevant to surface water impacts. See Appendix B.9.3 for more detailed information about these requirements.

**Exhibit 14-4. Statutes, Regulations, and Other Requirements Related to the Protection of Surface Waters**

Statute	Location in U.S. Code	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Clean Water Act	33 U.S.C. §§ 1251-1387	40 CFR parts 110-112, 116, 117, 122, 125, 129, 130, 131,136, and 403	EPA, state, and tribal Water Quality Agencies	Establishes the basic structure for regulating the discharge of pollutants into waters of the United States. <sup>7</sup> The sections of the CWA relating to waters of the United States are Section 303(d), Section 404, Section 401, and Section 402, which establishes the NPDES permit program.

<sup>7</sup> A water of the United States is considered a jurisdictional surface water or wetland under the CWA; the regulatory definition is found at 33 CFR § 328.3(a), and further guidance is found in the EPA/USACE Memorandum “Clean Water Act Jurisdiction Following the U.S. Supreme Court’s Decision in *Rapanos v. United States & Carabell v. United States*.” Any surface water not meeting this definition is considered non-jurisdictional, and therefore has no statutory protection under the CWA. It is important to note that not all

Statute	Location in U.S. Code	Implementing Regulation(s)	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Fish and Wildlife Coordination Act	16 U.S.C. §§ 661-667d	Final regulations have not been issued	USFWS	Requires Federal agencies to consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed Federal or applicant projects may result in control or modification of the water of any stream or other water body (including wetlands).
Rivers and Harbors Act	33 U.S.C § 401 and 403	33 CFR parts 320-332 33 CFR parts 114-118	USACE; USCG	Established to protect the navigability of waters used for commerce in the United States.
Safe Drinking Water Act	42 U.S.C. §§ 300(f)-300j-26	40 CFR parts 141-149	EPA	Prohibits Federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area.
State statutes protecting surface waters	Not applicable	Not applicable	Applicable state	In addition to the Federal requirements discussed above, there may be additional state and local surface water statutes and regulations that apply to the proposed project. This should be determined on a case-by-case basis by contacting relevant state and local regulatory agencies in the early stages of project planning.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; USACE = U.S. Army Corps of Engineers; EPA = U.S. Environmental Protection Agency; CWA = Clean Water Act; NPDES = National Pollutant Discharge Elimination System; USFWS = U.S. Fish and Wildlife Service; NMFS = National Marine Fisheries Service; USCG = U.S. Coast Guard.

#### 14.3.1.1. Consultations, Permits, and Other Approvals

Early coordination among the FAA, USFWS, EPA, and the USACE may assist the FAA in addressing surface water issues or conflicts early in the NEPA process and in developing ways to resolve them. If an alternative would impact a surface water that is determined to be jurisdictional by the USACE under the CWA and/or the Rivers and Harbors Act, the following permits and certification may be required depending on the type of activity.

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surface waters are considered jurisdictional under the CWA. This determination is made on a case-by-case basis by the USACE; as a result, the FAA should consult with the USACE to determine the jurisdictional status of any surface water that may be affected by a proposed action or alternative(s).



### ***Section 404 Permit and 401 Certification***

For discussion of the Section 404 permit and 401 certification processes, see Section 14.1.1.1 above. The process for jurisdictional wetlands and surface waters is the same.

### ***Section 402 NPDES Permit***

If the proposed action or alternative(s) has the potential to discharge pollutants into waters of the United States through a point source, a National Pollutant Discharge Elimination System (NPDES) permit will likely need to be obtained.

There are two basic types of NPDES permits: individual and general permits. An *individual permit* is a permit specifically tailored to an individual facility, and would typically be required for point source discharges. Once a facility submits the appropriate application(s), the permitting authority develops a permit for that particular facility based on the information contained in the permit application (e.g., type of activity, nature of discharge, receiving water quality, etc.). The permit authority issues the permit to the facility for a specific time period (not to exceed five years) with a requirement that the facility reapply prior to the expiration date. A *general permit* covers multiple facilities within a specific category and may be written to cover categories of point sources having common elements such as stormwater sources or facilities that involve the same or substantially similar types of operations.

A requirement of NPDES permits, for both operations and construction activities, is development of a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP outlines how stormwater run-off, erosion, and sediment will be controlled in order to minimize polluted stormwater run-off into nearby waters. For guidance on developing a SWPPP refer to EPA's "*Developing your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*" located on the EPA website at: [http://water.epa.gov/polwaste/npdes/stormwater/upload/sw\\_swppp\\_guide.pdf](http://water.epa.gov/polwaste/npdes/stormwater/upload/sw_swppp_guide.pdf).

The NPDES Construction General Permit is a type of general permit that is required if construction activities would disturb 1 acre (43,560 ft<sup>2</sup>) or more of land. Under this permit, construction refers to any actions that result in disturbance of the land, including clearing, grading, and other similar activities. It also includes construction-related activities, which occur in areas that support the construction project such as stockpiles, borrow areas, concrete truck washouts, fueling areas, material storage areas, and equipment storage areas.

The EPA published an effluent guidelines rule for airport de-icing activities (see *Effluent Limitations Guidelines and New Source Performance Standards for the Airport Deicing Category*, 77 *Federal Register* 29168, (May 16, 2012)). Airport de-icing is considered an industrial activity that requires coverage under an NPDES permit (see 40 CFR § 122.26(b)(viii)). For more information on airport de-icing activities and NPDES see: <http://water.epa.gov/scitech/wastetech/guide/airport/>.

For guidance on NPDES permits, refer to the EPA's NPDES website at: <http://water.epa.gov/polwaste/npdes/>.

### ***Section 10 Permit***

A Section 10 permit may be required under the Rivers and Harbors Act for any construction in, over, or under a navigable water. The USACE administers the Section 10 permit and Section 404 permit together, if applicable, and the USACE typically issues a joint permit since navigable

waters are subsumed by waters of the United States. For construction of new bridges or causeways, or for the reconstruction or modification of existing bridges or causeways over navigable waters, a Section 9 bridge permit must be obtained from the USCG.

For information on the USCG's Section 9 Bridge Permit process refer to:

[http://www.uscg.mil/hq/cg5/cg551/BPAG\\_Page.asp](http://www.uscg.mil/hq/cg5/cg551/BPAG_Page.asp).

For information on the USACE's Section 10 permit program refer to:

<http://www.spl.usace.army.mil/Missions/Regulatory/JurisdictionalDetermination/Section10oftheRiversHarborsAct.aspx>

### ***State and Local Permits and Certifications***

In addition to the Federal requirements, there may be additional state and local surface water statutes and regulations that apply to the proposed project. This should be determined on a case-by-case basis by contacting relevant state and local regulatory agencies in the early stages of project planning.

### **14.3.2. Affected Environment**

The surface water study area should be defined as the entire geographic area with the potential to be either directly or indirectly impacted by the proposed project, and not merely the area immediately adjacent to the action. Examples of direct impacts to surface waters include any in-water work resulting from expansion of an existing FAA facility adjacent to surface waters, or a withdrawal of water from a surface water for construction or operations. Indirect impacts could include sedimentation from nearby construction activities that could reach surface waters and cause impacts to water quality.

Publicly available GIS data and maps can be helpful when determining the potential presence of surface waters in the study area. Some sources that may be particularly useful in gathering information regarding surface waters in the study area include:

- The U.S. Geologic Survey's (USGS) Surface Water website at: <http://water.usgs.gov/> provides general information regarding surface water in addition to maps and data regarding water conditions. In addition, the USGS' *National Map Viewer* at: <http://viewer.nationalmap.gov/viewer/> is a web based GIS mapper that provides data visualization and download for national data sets, including surface water data;
- The USACE's website of USACE Regions throughout the United States at: <http://www.usace.army.mil/Locations.aspx> allows users to select a specific region and view the navigable waters in the region. Some USACE district websites provide the list of navigable waters in their district, while other districts do not. In these instances, consider calling the USACE district and requesting a list of navigable waters of the United States; and
- The EPA's website of EPA regions throughout the United States at: <http://water.epa.gov/type/location/regions.cfm> allows users to select a specific region and view a list of Section 303d impaired waters in that region.

In addition, state and local agencies may also have surface water maps and data available for review.

The presence of surface waters is best determined by visiting the study area to conduct a field delineation to determine if surface waters are present. Field delineations should be conducted by a specialist who can evaluate the proposed site's physical and hydrologic characteristics to determine if any surface waters are present in the study area and if those surface waters potentially meet the regulatory definition of a water of the United States. In non-tidal and non-wetland surface waters, the USACE jurisdiction under CWA extends to the *ordinary high water mark*; in tidal waters the USACE jurisdiction under CWA extends to the *mean high water line* (see text box).

If, by using available surface water maps and data, consulting with state or local agencies, or using a qualified expert, surface waters are determined to be present in the affected environment, a map should be included in the NEPA document which shows the surface waters in relation to the location of the proposed project.

*Ordinary High Water Mark* – the line on the non-tidal shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (33 CFR § 329.11(a)(1)).

*Mean High Water Line* – the line on the tidal shore established by the average of all high tides (33 CFR § 329.12(a)(2)).

### 14.3.3. Environmental Consequences

After the study area of the proposed project has been adequately described, the potential environmental consequences on all surface waters identified within the study area should be evaluated.

All areas where permanent infrastructure would be built, and locations where temporary construction-related activity might occur (such as equipment lay-down, staging, and building of temporary access roads) should be considered for potential direct construction-related impacts to water resources. Additionally, all areas where indirect impacts could occur within the study area should be identified. Indirect impacts could include sedimentation or petro-chemical spills from nearby construction activities that could reach surface waters and cause water quality issues.

The extent to which operation activities may affect surface waters should also be considered. For example, increased run-off from new impermeable surfaces or changes in hydrologic patterns could affect water quality and hydrology in nearby surface waters. Begin by characterizing any fill, excavation, or construction of structures that would have the potential to affect surface waters. It should also be determined if the proposed project's surface water impacts would fall under the terms and conditions of a Section 404 general permit, such as a Nationwide Permit. These pre-approved permits have already gone through the NEPA process and have been determined to not have significant adverse impacts to jurisdictional surface waters.

### 14.3.3.1. Significance Determination

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for surface waters. A significant impact exists if:

*The action would:*

1. *Exceed water quality standards established by Federal, state, local, and tribal regulatory agencies; or*
2. *Contaminate public drinking water supply such that public health may be adversely affected.*

In addition to the threshold above, Exhibit 4-1 of FAA Order 1050.1F provides additional factors to consider when evaluating the context and intensity of potential environmental impacts for surface waters. Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to surface waters include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values;
- Adversely affect surface waters such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

### 14.3.4. Mitigation

Some examples of potential measures to mitigate impacts to surface waters include:

- limiting ground disturbance to the areas necessary for project-related construction;
- employing erosion control measures to minimize sedimentation of surface waters;
- restoring vegetation on disturbed areas to prevent soil erosion following project completion;
- developing oil response plans designed to contain any potential spills of oil or oil-based products associated with the proposed action and alternative(s); or
- Section 404 and 401 permit terms and conditions for minimizing and compensating for impacts to surface waters.

For proposed projects that would impact surface waters through dredged or fill material (e.g., rerouting a stream), mitigation will be required under the CWA as part of the Section 404 permit process. For additional information on USACE and EPA regulations that govern mitigation for impacts to jurisdictional surface waters, see *Compensatory Mitigation Losses for Aquatic Resources*, 73 *Federal Register* 19594-19705, (April 10, 2008).

## 14.4. Groundwater

Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The term aquifer is used to describe the geologic layers that store or transmit groundwater, such as to wells, springs, and other water sources.

### 14.4.1. Regulatory Setting

Exhibit 14-5 lists the statutes and other requirements that may be relevant to ground water impacts. Federal activities affecting groundwater are primarily governed by the Safe Drinking Water Act (SDWA). The SDWA may not be applicable to every proposed project, and should only be included when relevant.

**Exhibit 14-5. Statutes and Other Requirements Related to the Protection of Groundwater**

Statute	Location in U.S. Code	Implementing Regulation	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Safe Drinking Water Act	42 U.S.C. §§ 300(f)-300j-26	40 CFR parts 141-149	EPA	Prohibits Federal agencies from funding actions that would contaminate an EPA-designated sole source aquifer or its recharge area.
State statutes protecting groundwater	Not applicable	Not applicable	States	There may be additional state and local groundwater statutes and regulations that apply to the proposed project. This should be determined on a case-by-case basis by contacting relevant state and local regulatory agencies in the early stages of project planning.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; EPA = U.S. Environmental Protection Agency.

#### 14.4.1.1. Consultations, Permits, and Other Approvals

Early coordination with EPA may assist the FAA in addressing groundwater issues or conflicts early in the NEPA process and in developing ways to resolve them. If there is the potential for contamination of an aquifer designated as an EPA-designated sole source aquifer for the area, the FAA must consult with the EPA regional office as required by Section 1424(e) of the SDWA.

### 14.4.2. Affected Environment

The groundwater study area should be defined as the entire geographic area with the potential to be either directly or indirectly impacted by the proposed project, and not merely the area immediately adjacent to the action. Examples of direct impacts to groundwater could include withdrawal of groundwater for operational purposes, or reduction of infiltration or recharge area due to new impervious surfaces.

Publicly available GIS data and maps can be helpful when determining the potential presence of groundwater in the study area. Some sources that may be particularly useful in gathering information regarding groundwater in the study area include:

- The USGS groundwater website at: <http://water.usgs.gov/ogw/> provides general information regarding groundwater in addition to maps and data; and
- The EPA provides a website on the EPA-designated sole source aquifer program at: <http://water.epa.gov/infrastructure/drinkingwater/sourcewater/protection/solesourceaquifer.cfm>. Maps and GIS data are provided for all EPA-designated sole sources aquifers in the United States.

In addition, state and local agencies may also have groundwater information and maps available for review.

### **14.4.3. Environmental Consequences**

After the study area of the proposed project has been adequately described, the consequences of the proposed action or alternative(s) on groundwater within the study area should also be evaluated.

Begin by characterizing any impervious surfaces, excavation, or construction of structures that would have the potential to affect groundwater. Different types of impacts to groundwater, including any direct or indirect impacts, that result from construction and operation of the proposed project should also be considered. All areas where permanent infrastructure would be built, and locations where temporary construction-related activity might occur (such as equipment lay-down, staging, and building of temporary access roads) should be considered for potential direct construction-related impacts to groundwater. Impacts could include petro-chemical spills from construction activities that could reach groundwater through infiltration and cause water quality issues.

The extent to which operation activities may affect groundwater should also be considered. For example, withdrawal and drawdown of groundwater from a new well that supplies water to a new facility could affect groundwater levels during operations, which in turn could affect other groundwater users in the area. New impervious surfaces could also create a barrier to infiltration, thus potentially affecting groundwater recharge.

#### **14.4.3.1. Significance Determination**

Exhibit 4-1 of FAA Order 1050.1F provides the FAA's significance threshold for groundwater. A significant impact exists if:

*The action would:*

1. *Exceed groundwater quality standards established by Federal, state, local, and tribal regulatory agencies; or*
2. *Contaminate an aquifer used for public water supply such that public health may be adversely affected.*

In addition to the threshold above, Exhibit 4-1 of FAA Order 1050.1F provides additional factors to consider when evaluating the context and intensity of potential environmental impacts for groundwater. Please note that these factors are not intended to be thresholds. If these factors

exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to groundwater include, but are not limited to, situations in which the proposed action or alternative(s) would have the potential to:

- Adversely affect natural and beneficial groundwater values to a degree that substantially diminishes or destroys such values;
- Adversely affect groundwater quantities such that the beneficial uses and values of such groundwater are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or
- Present difficulties based on water quality impacts when obtaining a permit or authorization.

#### **14.4.4. Mitigation**

Some examples of potential measures to mitigate impacts to groundwater include:

- limiting ground disturbance and depth to the areas necessary for project-related construction in sensitive and shallow groundwater areas;
- protecting water quality of surface water runoff that may infiltrate into the ground;
- restoring vegetation on disturbed areas to prevent soil erosion following project completion;
- limiting the area of new impervious surfaces to the areas necessary for project-related construction; and
- developing oil response plans designed to contain any potential spills of oil or oil-based products associated with the proposed action and alternative(s).

### **14.5. Wild and Scenic Rivers**

Wild and Scenic Rivers are those rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values as defined by the Wild and Scenic Rivers Act. If the FAA is taking an action that would physically impact resources covered by the Wild and Scenic Rivers Act, there may be consultation requirements under the Act.

### 14.5.1. Regulatory Setting

Exhibit 14-6 lists the statute that is relevant to wild and scenic rivers impacts.

**Exhibit 14-6. Statute Related to Wild and Scenic Rivers**

Statute	Location in U.S. Code	Implementing Regulation(s) <sup>a</sup>	Oversight Agency <sup>a</sup>	Summary <sup>a</sup>
Wild and Scenic Rivers Act	16 U.S.C. §§ 1271-1287	36 CFR part 297, subpart A (USFS)	NPS, USFWS, and BLM	Creates the National Wild and Scenic Rivers System to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.

<sup>a</sup> U.S.C. = United States Code; CFR = Code of Federal Regulations; USFS = U.S. Forest Service; NPS = National Park Service; USFWS = U.S. Fish and Wildlife Service; BLM = Bureau of Land Management.

The primary Federal law governing Wild and Scenic Rivers is the Wild and Scenic Rivers Act. This Act was created by Congress to preserve rivers with these characteristics in a free-flowing condition for the enjoyment of present and future generations. The Wild and Scenic Rivers Act established the National Wild and Scenic River System (National System), which consists of those rivers and river segments deemed by Congress to have one or more “outstandingly remarkable” scenic, recreational, geologic, fish and wildlife, historic, or cultural values. Rivers in the system are classified based on the degree of development present along the river, and whether the river is wild, scenic, or recreational. Four Federal agencies administer the Wild and Scenic Rivers Act for rivers within the National System: the BLM, the NPS, the USFWS, and the USFS. The agency chosen to administer a given component of the National System is based on which agency manages the land surrounding that river or river segment.

New rivers or river segments are added to the National System by Congress or the Secretary of the Interior (in some instances). Prior to considering whether or not a river should be added to the National System, a study of the river is authorized by Congress. These *study rivers* are rivers being proposed for addition to the National System. Study rivers may or may not end up being added to the National System, but still need to be considered for Federal actions.

The Nationwide River Inventory (NRI), which is maintained by the NPS, lists more than 3,400 rivers or river segments that appear to meet the minimum Wild and Scenic Rivers Act eligibility requirements based on their free-flowing status and resource values. The development of the NRI resulted, in part, from Section 5(d)(1) in the Wild and Scenic Rivers Act, which directed Federal agencies to consider *potential* wild and scenic rivers in their comprehensive land management processes. NRI listed rivers are afforded some protection from adverse impacts of Federal projects until detailed studies are conducted.<sup>8</sup> Rivers on the NRI list may or may not be recommended for addition to the National System. Federal agencies with a project that could

<sup>8</sup> It should be noted that Nationwide River Inventory (NRI) listed rivers are not part of the National System, and the requirements under Section 7 of the Wild and Scenic Rivers Act do not apply to NRI listed rivers. The authority directing all Federal agencies to avoid or mitigate actions adversely affecting NRI listed rivers comes from the President’s 1979 Environmental Message Directive on Wild and Scenic Rivers (August 2, 1979), and the August 11, 1980 CEQ Memorandum on Procedures for Interagency Consultation (found at: <http://www.nps.gov/nrcr/programs/rtca/nri/hist.html#pd>).



affect an NRI listed river must coordinate with the respective agency that has jurisdiction over that river.

Section 7 of the Wild and Scenic Rivers Act prohibits Federal agencies from assisting (by loan, grant, license, or otherwise) in the construction of any water resources project (projects that would disrupt the free-flowing character of designated Wild and Scenic Rivers or congressionally-authorized study rivers) that would have a direct and adverse effect on the values for which such river was included in the System or identified by Congress for study. Under Section 7, Federal agencies proposing a water resources project, as defined in the implementing regulations at 36 CFR § 297.3, with the potential to directly and adversely affect designated rivers or study rivers must coordinate with the respective agency responsible for administering the relevant river or river segment and obtain a Section 7 determination. In addition, Section 7 applies to federally proposed or assisted water resource projects below, above, or on a stream tributary to a designated river that will not invade the designated river area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area as of the date of designation.<sup>9</sup> If there is potential for a water resources project to have such impacts, Section 7 consultation is also required. States can also administer Wild and Scenic Rivers or segments of such rivers and should also be consulted, as applicable. For more information on the consultation process under Section 7, refer to *Wild & Scenic Rivers Act: Section 7 Technical Report of the Interagency Wild and Scenic Rivers Coordinating Council*, October 2004.<sup>10</sup>

Section 12 of the Wild and Scenic Rivers Act requires a Federal agency with jurisdiction over any lands which include, border upon, or are adjacent to a designated Wild and Scenic River or study river, to take action necessary to protect the river in accordance with the purposes of the Wild and Scenic Rivers Act.

**Section 4(f) Relation to Wild and Scenic Rivers.** Lands in Wild and Scenic River corridors may be subject to Section 4(f) of the U.S. Department of Transportation Act of 1966. Publicly-owned public parks, recreation areas, refuges, and historic sites in a Wild and Scenic River corridor are subject to Section 4(f); privately owned lands that have historic/archaeological sites on, or eligible for, the National Register of Historic Places are also subject to Section 4(f). Lands in Wild and Scenic River corridors managed for multiple uses may or may not be subject to Section 4(f) depending on the manner in which they are administered by the managing agency. Section 4(f) would apply to those portions of the land designated in a management plan for recreation or other Section 4(f) uses. See Chapter 5 of this Desk Reference for more information.

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<sup>9</sup> The same standard used for designated rivers applies to congressionally authorized study rivers. However, the standard for study rivers is slightly modified to eliminate “unreasonably diminish” and instead state “diminish,” which applies a slightly more protective standard to study rivers for the duration of the shorter term study process.

<sup>10</sup> [www.rivers.gov/documents/section-7.pdf](http://www.rivers.gov/documents/section-7.pdf)

### 14.5.1.1. Consultations, Permits, and Other Approvals

For any proposed action or alternative(s) affecting a designated Wild and Scenic River, study river, or NRI listed river, consultation with the appropriate land management agency must be conducted. The specific consultation requirements are explained below.

#### *Section 7 Determination for Designated Wild and Scenic Rivers and Study Rivers*

If the proposed action or alternative(s) includes a water resources project that may affect a designated Wild and Scenic River or study river,<sup>11</sup> a Section 7 determination from the agency (i.e., the NPS, BLM, USFWS, or USFS) with jurisdiction over the river or river segment will need to be obtained.

A separate document under Section 7 does not need to be prepared; typically, the NEPA document prepared for the proposed project will contain sufficient information for the relevant agency to prepare a determination. Early coordination with the relevant agency (i.e., during the early stages of document development) will ensure that the NEPA document contains any specific information or analysis needed by the agency in order to complete their determination.

As soon as possible (but no later than 60 days prior to issuing a decision or finding document for an action) the FAA should provide the relevant agency with the NEPA documentation necessary to make a Section 7 determination. At a minimum, the documentation must include:

- the name and location of the affected river;
- the location of a project;
- the nature of the permit or other authorization proposed for issuance;
- a description of the proposed activity;
- any proposed mitigation; and
- any other relevant information, such as plans, maps, and environmental studies, assessments or EISs.

Upon receiving this information from the FAA, the relevant agency will make a determination regarding whether the proposed project will:

- have a direct and adverse effect on the values for which the Wild and Scenic River or study river was designated; or
- for designated rivers (or study rivers), the project will not invade nor unreasonably diminish the scenic, recreational, and fish and wildlife values of the river through impacts to river segments above or below the river, or in the stream tributaries to the river.

Based on these considerations, the relevant agency will either provide the FAA with consent to go forward with the action or deny consent. The Secretary charged with the river's administration may also recommend measures to eliminate the adverse impacts. If the agency does not issue a consent determination, the FAA cannot proceed with the action.

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<sup>11</sup> "May affect" includes actions in the bed or banks of the designated Wild and Scenic River System river or study river, or in the bed or banks of a river segment above or below the designated or study river, or on the stream tributaries to a designated or study river in some instances.

### ***NRI Rivers Consultation***

If an action could affect a river or river segment listed on the NRI, but the FAA determines that the action would not result in adverse impacts on the NRI river (for example, through preparation of a FONSI), the FAA should send a copy of the EA and FONSI to the relevant regional NPS office for their file.

If an action has the potential to result in an adverse effect on the natural, cultural, and/or recreational values of a river or river segment listed on the NRI, the FAA should consult with the appropriate regional office of the NPS.<sup>12</sup> As early as possible in the project planning process, the FAA should request assistance, in writing, from the regional NPS office in evaluating the impacts of the proposed action and alternative(s) on the NRI river. This request should provide enough information to the NPS office regarding the proposed action and alternative(s) to allow them to make a determination regarding the impacts of the action on the natural, cultural, and recreational values of the river. The NPS will also assist in developing appropriate measures to avoid or mitigate impacts to the NRI river. If the NPS does not respond to the FAA's request for assistance within 30 days, the FAA may proceed with the analysis as otherwise planned, taking care to avoid or minimize adverse impacts on the NRI river.

Under CEQ's August 10, 1980 memorandum, *Procedures for Interagency Consultation to Avoid or Mitigate Adverse Effects on Rivers in the Nationwide Inventory*, available at:

[http://energy.gov/sites/prod/files/Mitigate\\_Effects\\_Rivers.pdf](http://energy.gov/sites/prod/files/Mitigate_Effects_Rivers.pdf), when consultation with U.S. Department of the Interior (DOI) leads to a determination that the impacts on a NRI river segment are significant, or would preclude inclusion in the Wild and Scenic River System or downgrade its classification, the FAA should invite the NPS and any affected land management agencies to be cooperating agencies. If the NPS does not respond to such request for assistance within 30 days, then the FAA may proceed as otherwise planned, taking care to avoid or minimize adverse impacts on the National Inventory River. For projects requiring EISs, the ROD must adopt appropriate avoidance and mitigation measures and a monitoring and enforcement program.

### **14.5.2. Affected Environment**

The study area should be defined as the entire geographic area with the potential to be either directly or indirectly impacted by the proposed action and alternative(s). For example, if construction of a new facility is part of the proposed action or alternative(s), the study area should include any areas directly impacted through any visual, audible, or other type of intrusion that is out of character with the river or alters the outstanding features of the river's setting. The study area should also include any area indirectly impacted by the proposed action and alternative(s), such as rivers or river segments many miles downstream from the construction footprint of a project which may experience changes in water quality or quantity due to the proposed action and alternative(s). In addition, the default boundaries of Wild and Scenic Rivers as defined in the Wild and Scenic Rivers Act extend to a maximum of one-quarter mile from the ordinary high water mark on each side of the river (an average of not more than 320 acres per mile). As a result, be sure to consider any area within this boundary as part of the study area.

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<sup>12</sup> It should be noted that the NPS is available to assist other Federal agencies in carrying out the NRI consultation process; however, it is the role of the Federal permitting agency (i.e., the FAA and not the NPS) to ensure that effects to NRI rivers are avoided or mitigated.

After the study area has been established, the presence of Wild and Scenic Rivers, study rivers, and NRI rivers in the study area will need to be determined.

Some sources that may be particularly useful in determining whether a river or river segment has been designated as a Wild and Scenic River, study river, or is listed on the NRI include:

- the NPS's NRI website at: <http://www.nps.gov/ncrc/programs/rtca/nri/> provides a map which can assist in determining if any rivers in the study area are included on the NRI; and
- the National Wild and Scenic River's Designated Wild and Scenic Rivers website at: <http://www.rivers.gov/map.php> provides a list of all designated Wild and Scenic Rivers in the National System as well as all study rivers.

In addition, consider contacting the Federal, state, tribal, or local agency responsible for managing the land adjacent to the river for information regarding the land use.

If any Wild and Scenic Rivers, study rivers, or NRI rivers are identified in the study area, a map which shows the river location in comparison to the location of the study area should be included in the NEPA document.

### **14.5.3. Environmental Consequences**

After the affected environment of the proposed project has been adequately described, the environmental consequences of the proposed action and alternative(s) on all Wild and Scenic Rivers, study rivers, and NRI listed rivers located within the study area should be evaluated.

Different types of impacts to Wild and Scenic Rivers, study rivers, and NRI listed rivers should be considered, including any direct and indirect impacts that result from construction and operation activities of a proposed action or alternative(s). All areas where permanent infrastructure would be built and locations where temporary construction-related activity might occur (such as equipment lay-down, staging, and building of temporary access roads) should be considered for potential direct construction-related impacts. Other potential impacts that should be assessed include noise, air quality, and visual impacts. In addition, any impact that affects or alters the scenic, recreational, geologic, fish, wildlife, historic, or cultural values for which the river was designated (or considered for designation) should be considered.

#### **14.5.3.1. Significance Determination**

The FAA has not established a significance threshold for Wild and Scenic Rivers in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts for Wild and Scenic Rivers (see Exhibit 4-1 of FAA Order 1050.1F). Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to Wild and Scenic Rivers include, but are not limited to, situations in which the proposed action and or alternative(s) would have an adverse impact on the values for which a river was designated (or considered for designation) through:

- Destroying or altering a river's free-flowing nature;
- A direct and adverse effect on the values for which a river was designated (or under study for designation);

- Introducing a visual, audible, or other type of intrusion that is out of character with the river or would alter outstanding features of the river's setting;
- Causing the river's water quality to deteriorate;
- Allowing the transfer or sale of property interests without restrictions needed to protect the river or the river corridor (which cannot exceed an average of 320 acres per mile which, if applied uniformly along the entire designated segment, is one-quarter of a mile on each side of the river); or
- Any of the above impacts preventing a river on the Nationwide Rivers Inventory (NRI) or a Section 5(d) river that is not included in the NRI from being included in the Wild and Scenic River System or causing a downgrade in its classification (e.g., from wild to recreational).

#### 14.5.4. Mitigation

Some examples of potential measures to mitigate impacts to Wild and Scenic Rivers include:

- avoiding Wild and Scenic Rivers, study rivers, or NRI rivers by re-siting components outside the 0.25 mile corridor;
- removing structures (such as discharge structures) following completion of construction activities;
- re-siting project components to areas of previously disturbed riverbank;
- reducing discharge velocities to avoid scouring of the riverbed;
- transporting construction materials, such as rip-rap, offsite rather than storing such materials within view of the river; and
- designing a project to reduce visual and noise impacts.

During the environmental review process, NPS, BLM, USFWS, or USFS (or other expert resource agency) would normally provide letters addressing action impacts on the affected river. Often, those letters include recommended measures to avoid those impacts. When dealing with designated rivers in the Wild and Scenic River System and study rivers, if the result of the Section 7 consultation is a conclusion that a water resources project would have direct and adverse impacts on the values for which the river was designated, measures proposed by the expert resource agency that are designed to avoid the identified direct and adverse impacts must be adopted or the FAA cannot grant approval for the proposal.<sup>13</sup> The same prohibition applies to actions above, below, or in the stream tributaries of a designated river or study river where a water resources project invades or unreasonably diminishes (for designated rivers) or diminishes (for study rivers) the scenic, recreational, and fish and wildlife values present. An appendix to the NEPA document should include copies of consultation letters. The NEPA document should

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<sup>13</sup> Section 7 of the Wild and Scenic Rivers Act not only requires consultation with applicable agencies, but also prohibits the FAA from assisting an action "by loan, grant, license, or otherwise . . . that would have a direct and adverse effect on the values for which such river was established." Section 7 also prohibits the FAA from assisting an action that would "invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present" of a river segment above, below or in the stream tributaries of a designated river (or for study rivers, the standard is an action that would invade the study river or "diminish" scenic, recreational, and fish and wildlife values present).

summarize the most important information in those letters and accurately cross-reference the appendix and pages in that appendix for further information. If mitigation is suggested, but not necessary to avoid direct and adverse impacts on the values for which a Wild and Scenic River or study river were designated, and the FAA or the applicant does not adopt any recommended mitigation, the NEPA document should clearly explain why the recommendation was not adopted.

#### **14.5.5. Summary of FAA Wild and Scenic River, Study River, and NRI River Assessment Responsibilities**

FAA assessment responsibilities include:

1. Determine if any Wild and Scenic Rivers, study rivers, NRI, or otherwise eligible rivers or river segments under Section 5(d) are within a project's study area. If no Wild and Scenic Rivers, study rivers, NRI, or Section 5(d) rivers are found within the study area, no further analysis is needed.
2. If present, conduct a review of the proposed project with the agency that has jurisdiction over the river or river segment.
3. If the proposed action or alternative(s) includes a water resources project that could affect a designated Wild and Scenic River or study river, the FAA must obtain a Section 7 consent determination from the agency (i.e., the NPS, BLM, USFWS, or the USFS) with jurisdiction over the river or river segment. If the agency does not issue a consent determination, the FAA cannot proceed with the action (however, this prohibition has time limits when a study river is involved, as outlined in Section 7(b) of the Act).
4. If the proposed action or alternative(s) includes a water resources project that could affect an area outside a designated river corridor (an area below, above, or in the stream tributaries to the designated river) and that could invade the designated river, or unreasonably diminish the scenic, recreational, fish or wildlife values of the designated river, the FAA must obtain a Section 7 consent determination from the agency (i.e., the NPS, BLM, USFWS, or the USFS) with jurisdiction over the river or river segment. If the agency does not issue a consent determination, the FAA cannot approve the action, or portion of the action, that constitutes a water resources project.
5. If the proposed action or alternative(s) includes a water resources project that could affect an area outside a study river corridor (an area below, above, or in the stream tributaries to the study river) and that could invade the study river, or diminish the scenic, recreational, fish or wildlife values of the study river, the FAA must obtain a Section 7 consent determination from the agency (i.e., the NPS, BLM, USFWS, or the USFS) with jurisdiction over the study river or study river segment. If the agency does not issue a consent determination, the FAA cannot approve the action, or portion of the action, that constitutes a water resources project.
6. If the proposed action or alternative(s) has the potential to impact a river or river segment listed on the NRI, but the FAA determines that the proposed action and alternative(s) would not result in adverse impacts on the NRI river (for example, through preparation of a FONSI), the FAA should send a copy of the NEPA document to the relevant regional NPS office for their file.

7. If the proposed action or alternative(s) has the potential to result in an adverse effect on the natural, cultural, and/or recreational values of a river or river segment listed on the NRI, the FAA should consult with the appropriate regional office of the NPS. If the NPS does not respond to the FAA's request for assistance within 30 days, the FAA may proceed with the analysis as otherwise planned, taking care to avoid or minimize adverse impacts on the NRI river.
8. All information and documentation of consultations on potential impacts to Wild and Scenic Rivers, study rivers, or NRI rivers, including a Section 7 consent determination if applicable, should be included in the NEPA document.

## 15. Cumulative Impacts

<b>15.1. Past, Present, and Reasonably Foreseeable Future Actions.....</b>	<b>15-1</b>
<b>15.2. Defining the Study Area .....</b>	<b>15-2</b>
<b>15.3. Significance Determination .....</b>	<b>15-2</b>
<b>15.4. Mitigation.....</b>	<b>15-2</b>
<b>15.5. Presentation of the Analysis Results.....</b>	<b>15-3</b>

The Council on Environmental Quality (CEQ) Regulations define a *cumulative impact* as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (see 40 CFR § 1508.7). Cumulative impacts can be viewed as the total combined impacts on the environment of the proposed action or alternative(s) and other known or reasonably foreseeable actions.

Cumulative impacts should be considered as early as possible in the project development process, as early identification of potential cumulative impacts may help in the design of alternatives or mitigation measures that minimize a project’s impacts on the environment. If it is determined that there would be no cumulative impacts, clearly document the basis for that conclusion.

The depth of a cumulative impacts analysis should be commensurate with the potential for significant impacts. The scope and extent of the analysis will vary by project type, geographic location, potential to impact resources, and other factors such as the current condition of potentially affected impact categories. While significant impacts of FAA actions tend to be primarily in the airport vicinity, the consideration of cumulative impacts is not limited to the airport or near the airport. The analysis should focus on impacts that are truly meaningful to decision-makers.

For more information on cumulative impacts analysis, see CEQ’s *Considering Cumulative Effects Under the National Environmental Policy Act* (January 1997), available on CEQ’s NEPA website at: [http://energy.gov/sites/prod/files/nepapub/nepa\\_documents/RedDont/G-CEQ-ConsidCumulEffects.pdf](http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-ConsidCumulEffects.pdf).

### 15.1. Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable future actions must be considered in determining whether there are potential cumulative impacts. Actions can be initiated by any entity (i.e., other Federal agencies, state, tribal, or local governments, or private entities).

**Past actions** are actions that occurred in the past and may warrant consideration in determining the environmental impacts of an action. The FAA has discretion to determine whether, and to what extent, information about the specific nature, design, or present impacts of a past action are useful for the analysis of the impacts of the proposed action and alternative(s). Present impacts of past actions that are relevant and useful are those that may have a significant cause-and-effect relationship with the direct and indirect impacts of the proposed action and alternative(s). For example, past industrial or military activities may have contaminated portions of a project site.



See CEQ's *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (June 2005) at: [http://energy.gov/sites/prod/files/nepapub/nepa\\_documents/RedDont/G-CEQ-PastActsCumulEffects.pdf](http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-PastActsCumulEffects.pdf).

**Present actions** are any other actions that are occurring in the same general time frame as the proposal. Examples include: 1) new approach procedures proposed at an airport where a terminal expansion project is underway; or 2) a state transportation department implementing roadwork on a nearby thoroughfare. Such actions may have traffic, noise, or other environmental concerns that should be considered in conjunction with those that would be generated by the FAA proposed action and alternative(s) under consideration.

**Reasonably foreseeable future actions** are actions that may affect projected impacts of a proposal and are not remote or speculative. Reasonably foreseeable future actions should be considered for each future time frame evaluated in the NEPA document. An action may be reasonably foreseeable even in the absence of a specific proposal. Coordination with other agencies and local governments and review of planning documents, if available, can be helpful in identifying reasonably foreseeable future actions. For example, the local government may have plans describing future actions for developing a property adjacent to where new aviation infrastructure is proposed. Future actions not grounded in planning documents, projected development trends, or regional or local plans would typically be considered remote and speculative, and thus need not be analyzed. In addition, future actions may be considered improbable or remote even though they have been mentioned in planning documents (e.g., general statements about future growth opportunities and unrefined lists of potential projects). Such actions should be mentioned in the NEPA document with an indication that they are not reasonably foreseeable.

## 15.2. Defining the Study Area

The study area for cumulative impacts analysis is the same area defined for a project's direct and indirect impact analysis (see the Introduction and the Affected Environment sections of Chapter 1 to 14 of this Desk Reference). Thus, the study area will be different for each impact category.

## 15.3. Significance Determination

The significance of cumulative impacts should be determined in the same manner as the significance of direct and indirect impacts (see the Significance Determinations sections of Chapter 1 to 14 of this Desk Reference). In some cases, cumulative impacts from other proposed or implemented project(s) in conjunction with the direct and indirect impacts from the proposed action or alternative(s) may together yield significant impacts and lead to a finding of significance, even though the direct and indirect impacts from the proposed action or alternative(s) alone are not significant. Consultation with agencies having special expertise or jurisdiction regarding a specific impact category can also assist in determining the significance of cumulative impacts.

## 15.4. Mitigation

Cumulative impacts may influence the mitigation considered for the proposed action. The FAA's consideration of mitigation would not extend to mitigating impacts of non-FAA actions.

## **15.5. Presentation of the Analysis Results**

The best location(s) for the cumulative impacts analysis in a NEPA document will vary by project. In some cases, presentation of the cumulative impacts analysis may be clearest and most effective in an independent section or chapter that details all cumulative impacts by impact category and alternative and describes how they are interrelated. In other circumstances, the cumulative impacts analysis may be easier for the decision-maker to understand when included within the discussion of each individual impact category.

## 16. Irreversible and Irretrievable Commitment of Resources

This chapter describes how to consider irreversible and irretrievable commitment of resources in NEPA reviews. An *irreversible or irretrievable commitment of resources* refers to impacts on or losses to resources that cannot be recovered or reversed. Examples include permanent conversion of wetlands and loss of cultural resources, soils, wildlife, agricultural production, or socioeconomic conditions. *Irreversible* is a term that describes the loss of future options. It applies primarily to the impacts of use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long periods of time. *Irretrievable* is a term that applies to the loss of production, harvest, or use of natural resources. For example, if farm land is used for a non-agricultural event, some or all of the agricultural production from an area of farm land is lost irretrievably while the area is temporarily used for another purpose. The production lost is irretrievable, but the action is not irreversible.

As stated in 40 CFR § 1502.16 of the Council on Environmental Quality (CEQ) Regulations, the FAA must identify, as part of the environmental consequences discussion in an Environmental Impact Statement (EIS), any irreversible or irretrievable commitments of resources which would be involved in the proposed action or reasonable alternative(s), should they be implemented. Discussion of irreversible or irretrievable commitments of resources is not required in an Environmental Assessment (EA).

Below are some examples of questions to consider in determining the irreversible or irretrievable commitments of resources that would result from a proposed action or alternative:

- Would natural or human-made resources be expended during implementation of the proposed action or alternative(s)? For instance, consider whether fossil fuels, electricity, or similar resources would be used as a result of the proposed action and alternative(s).
- Would natural resources (such as metals, raw building materials, water, or other materials) be needed in order to construct any structure included in the proposed action or alternative(s)?
- Would biological resources (such as soil or habitat) or cultural resources (such as archeological sites or historic properties) be physically altered or destroyed because of the proposed action or alternative(s)?

Consider irreversible or irretrievable losses in relation to each impact category identified in Chapters 1 through 14 of this Desk Reference. Include a discussion of any identified irreversible or irretrievable commitments of resources in an EIS, either as a stand-alone chapter, or as part of the environmental consequences discussion for each impact category.

## **17. Specific Guidance on use of FAA Categorical Exclusions**

<b>17.1. CATEX 5-6.6b Aerobatic Actions.....</b>	<b>17-3</b>
<b>17.2. CATEX 5-6.5q [CATEX1].....</b>	<b>17-12</b>
<b>17.3. CATEX 5-6.5r [CATEX2].....</b>	<b>17-24</b>

This chapter provides guidance memos on application of specific Categorical Exclusions (CATEX), including implementing instructions for the legislative CATEXs established through FAA's Reauthorization Act of 2012.

## 17.1. CATEX 5-6.6b Aerobatic Actions

*Authorizations and waivers for infrequent or one-time actions, such as an air show or aviation-related exposition (to include an aerobatic practice area containing one aerobatic practice box or aerobatic contest box) or parachuting or skydiving events, that may result in some temporary impacts that revert back to original conditions upon action completion. (ATO, AVS)*

Clarification of FAA Order 1050.1 CATEX for Aerobatic Actions was originally implemented on January 10, 2013 and provides guidance on the interpretation of terms and facilitation of consistent application of this CATEX. This memo is still valid.

Please note that references to CATEX 312b of Order 1050.1E is now CATEX 5-6.6b of Order 1050.1F. The following pages contain the original guidance memo.



# Federal Aviation Administration

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## Memorandum

### FAA Order 1050.1, Guidance Memo #6<sup>1</sup>

Date: January 10, 2013

To: Bruce DeCleene, Manager, Flight Technologies and Procedures Division, AFS-400 Michael Danahy, Acting Manager, Quality, Integration and Process Division, AQS-100

CC: Rebecca Cointin, Manager, Noise Division, AEE-100

From: Julie Marks, Manager, Environmental Policy and Operations Division, AEE-400

Subject: Clarification of FAA Order 1050.1 CATEX for Aerobatic Actions

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### PURPOSE

This memorandum is in response to Aviation Safety's (AVS) request for clarification from the Office of Environment and Energy (AEE) for the Categorical Exclusion (CATEX) pertaining to aerobatic actions in FAA Order 1050.1 *Environmental Impacts: Policies and Procedures* in order to harmonize the interpretation of terms and facilitate consistent application of this CATEX. The current version of the order is FAA Order 1050.1E, Change 1, and the CATEX pertaining to aerobatic actions is contained in paragraph 312b (*Categorical Exclusions for Regulatory Actions*). Paragraph 312b FAA Order 1050.1E, Change 1 reads as follows:

**312b. Authorizations and waivers for infrequent or one-time actions, such as an airshow or aviation-related exposition, to include an aerobatic practice box or aerobatic contest box per FAA Order 8700.1, Chapter 48, and parachuting or skydiving events that may result in some temporary impacts that revert back to original conditions upon action completion. (ATO, AFS)<sup>2</sup>**

There have been different interpretations of the term "infrequent" used in Categorical Exclusion (CATEX) 312b. In addition, the use of the terms "aerobatic practice box" and "aerobatic contest box," as opposed to "aerobatic practice area," may make it difficult to determine when the CATEX is applicable. Therefore, this memorandum seeks to (1) define the term "infrequent" in

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<sup>1</sup>This document is guidance memo #6 for FAA Order 1050.1. It is the sixth in a series of memos to provide additional guidance on FAA's NEPA requirements, procedures, and practices.

<sup>2</sup> This CATEX references 8700.1, which no longer exists. The current reference is FAA Order 8900.1 Flight Standards Information Management System, Volume 3 General Technical Administration, Chapter 5 Issue a Certificate of Waiver for an Aerobatic Practice Area or an Aerobatic Contest Box, Section 1

the context of the aerobatic actions CATEX<sup>3</sup> and (2) clarify the applicability of CATEX 312b to “aerobatic practice areas” (APAs).

### **DEFINING “INFREQUENT”**

Based on years of experience with aerobatic operations, noise is the environmental impact with the most potential to result in a significant impact. Therefore, aerobatic operations that can occur and not cause a significant noise impact have been determined by examining the noise results of the Volpe National Transportation System Center (Volpe) Report DOT-VNTSC-FAA-12-06 named “Analysis of Aerobatic Aircraft Noise Using the FAA’s Integrated Noise Model”, hence referred to as the Volpe Report.

The Volpe Report grouped aerobatic operations by aircraft category (e.g., low weight piston, high power radial (warbird), high power jets) and by routine type (i.e. Sportsman, Intermediate, Advanced, Unlimited). The Volpe Report examined the aircraft types and routines that are flown in the aerobatic practice box or aerobatic contest box, along with different numbers of operations flown. Based on the Volpe Report results, AEE has determined that the number of operations by aircraft category is the governing factor for noise impact and that the type of routines being flown do not result in a substantial difference in noise. We have also used the Volpe Report to determine the number of operations by aircraft category that can be flown in an aerobatic practice box in a year without resulting in a Day-Night Average Sound Level (DNL) of 65 decibels (dB) and, therefore, would not result in a significant noise impact. Since a significant noise impact could only occur if a proposed action would cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB, an annual number of operations in an aerobatic practice box that would not result in a DNL of 65 dB would not result in a significant noise impact absent extraordinary circumstances.<sup>4</sup> Accordingly, we can support a CATEX that defines infrequent use in terms of numbers of annual operations by aircraft category.

For low weight pistons, mid weight pistons, high weight pistons and high weight radials, “infrequent” is defined as 18,000 or less annual operations. For aircraft that are categorized as mid power jets and high power radials (warbirds), “infrequent” is defined as 1,800 or less annual operations. Finally, for high power jets, “infrequent” is defined as 300 or less annual operations. Below is a table with these aircraft categories and the corresponding “infrequent” definition. The Attachment lists aircraft by name and engine type within each category that were used to determine these numbers.

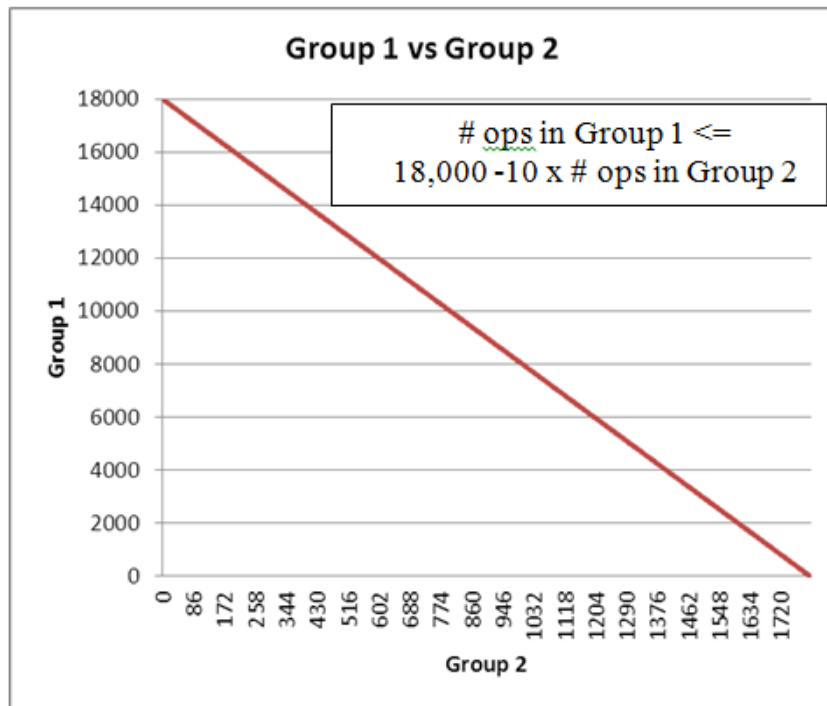
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<sup>3</sup> In this memorandum, the term “aerobatic actions CATEX” refers to CATEX 312b in FAA Order 1050.1E, Change 1, and future versions of this CATEX contained in FAA Order 1050.1F and subsequent revisions, unless explicitly stated otherwise

<sup>4</sup> Special consideration needs to be given to certain noise sensitive areas where other noise is very low and a quiet setting is a generally recognized purpose and attribute (e.g., quiet areas in national parks), see FAA Order 1050.1E Change 1 Section 14.3

Aircraft Category	Aircraft Group (for mixed use definition)	“Infrequent” Definition
Low Weight Pistons	Group 1	18,000 or less annual operations
Mid Weight Pistons	Group 1	18,000 or less annual operations
High Weight Pistons	Group 1	18,000 or less annual operations
High Weight Radials	Group 1	18,000 or less annual operations
Mid Power Jets	Group 2	1,800 or less operations
High Power Radials (Warbirds)	Group 2	1,800 or less operations
High Power Jets	Group 3	300 or less annual operations

In addition, “infrequent” has been defined for situations when the aerobatic practice box or the aerobatic contest box will be used by more than one aircraft group, i.e., “mixed use”. For mixed use situations, the definition of “infrequent” is defined using a graphical method to account for a trade-off between the numbers of aircraft in each group that ensures noise would remain below the significant level. Below are three graphs showing the trade-offs between the three groups. Annual numbers of operations on and below the line depicted in the graphs support a CATEX. An exact number can be found by using the formula provided.



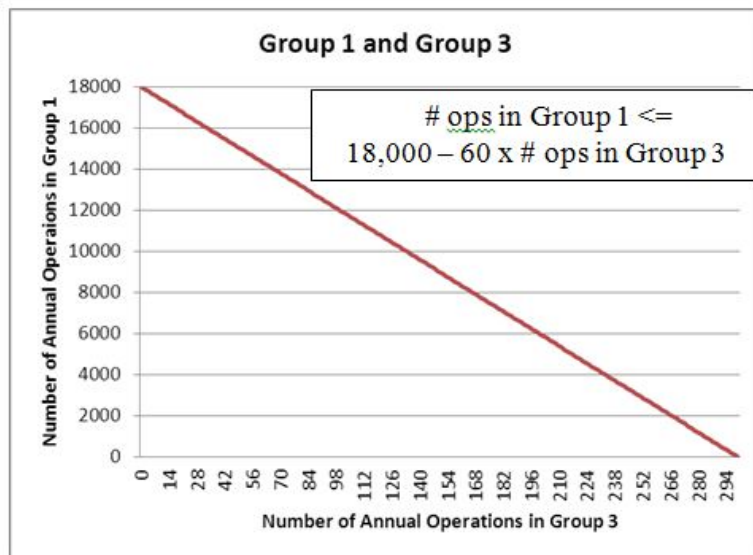
Example: Number of annual operations in Group 1 is 10,000, and number of annual operations in Group 2 is 770.

$$18,000 - 10 \times 770 = 18,000 - 7,700 = 10,300$$

The number of annual operations in Group 1 (10,000 ops) is less than 10,300.

The APA with this mixed use is eligible for the aerobatic actions CATEX.

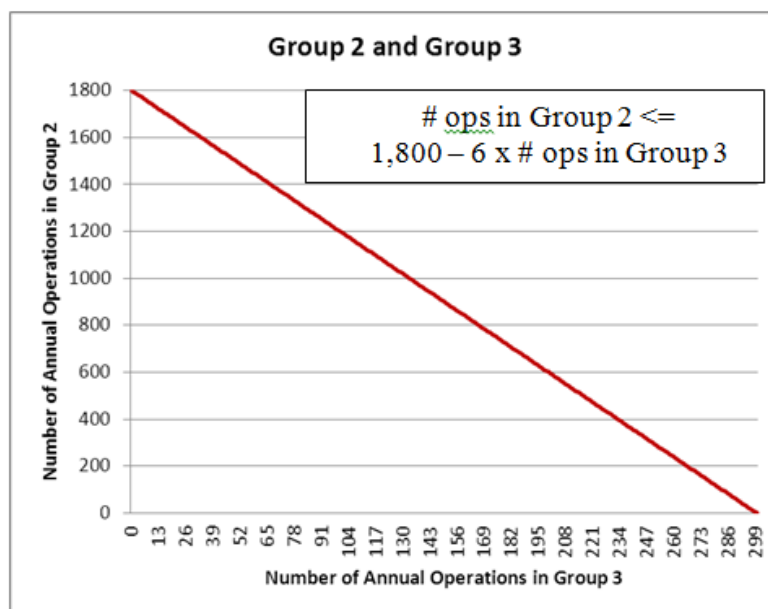




Example: Number of annual operations in Group 1 is 8,000, and number of annual operations in Group 3 is 170.

$$18,000 - 60 \times 170 = 18,000 - 10,200 = 7,800$$

The number of annual operations in Group 1 (8,000 ops) is not less than or equal to 7,800. The APA with this mixed use is not eligible for the aerobatic actions CATEX.



Example: Number of annual operations in Group 2 is 800, and number of annual operations in Group 3 is 166.

$$1,800 - 6 \times 166 = 1,800 - 996 = 804$$

The number of annual operations in Group 2 (800 ops) is less than 804.

The APA with this mixed use is eligible for the aerobatic actions CATEX.

Should a unique situation occur in which mixed use is proposed that would involve all three groups of aircraft, please consult AEE regarding the calculation of operations that would be eligible for a aerobatic actions CATEX.

### **AEROBATIC PRACTICE AREA APPLICABILITY**

While CATEX 312b has been applied to aerobatic practice boxes and aerobatic contest boxes, it has not been applied to aerobatic practice areas (APAs). This guidance is intended to clarify that CATEX 312b can be applied to Certificates of Waiver requests for an “aerobatic practice area,” when the request for a waiver is limited to one box.

FAA Order 8900.1 Flight Standards Information Management System, Volume 3 General Technical Administration, Chapter 5 Issue a Certificate of Waiver for an Aerobatic Practice Area or an Aerobatic Contest Box, Section 1<sup>5</sup>, paragraph 3-118(A)(3)(a) states that “An aerobatic practice area is established for the purpose of practicing aerobatic skills” but does not define the area. FAA Order 8900.1, Volume 3, Chapter 5, Section 1, paragraph 3-118(A)(3)(b) also states that an “aerobatic contest box is established for the sole purpose of conducting competitive aerobatic demonstrations in accordance with the rules, procedures and practices of the International Aerobatic Club (IAC).” In addition, FAA Order 8900.1, Volume 3, Chapter 6 states that an “aerobatic box” is “The airspace at an air show where participating aircraft are authorized to perform aerobatic maneuvers appropriate to their category.”

The federal action associated with an “aerobatic practice area” is the Certificate of Waiver, which is the same federal action as for an “aerobatic practice box” and the same action to which CATEX 312b is applied.

An “aerobatic practice area” containing a single box is essentially the same as an “aerobatic practice box” and should be treated the same for purposes of applying CATEX 312b. Examination of documentation associated with 115 Waiver requests from approximately 2009 to 2011 compiled by AVS found that 95.7% of the “aerobatic practice areas” analyzed contain single boxes.

### **CONCLUSION**

Based upon a review of the data in the Volpe Report, consultation with AVS, and absent extraordinary circumstances, the aerobatic actions CATEX (paragraph 312b in FAA Order 1050.1E, Change 1) can be applied to Certificates of Waiver requests for an “aerobatic practice area” (in addition to aerobatic practice boxes and aerobatic contest boxes) when (1) the request for a waiver is limited to one box, and (2) the APA usage will not exceed the numbers of annual operations for the appropriate aircraft category or mix of categories allowed in this guidance memo.

We hope that this clarification will alleviate any misinterpretation of the CATEX in question, and provide consistent understanding across the AVS organization.

cc: AFS-408, AGC-600

/s/ Julie Marks on January 10, 2013

Manager, Environmental Policy and Operations Division, AEE-400

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<sup>5</sup> <http://fsims.faa.gov/PICResults.aspx?mode=EBookContents>

## Attachment

### Aircraft List

The mappings of aerobatic aircraft used for the definition of “infrequent” are presented below.

#### Low Weight Piston

Aircraft Name	Engine
Steen Skybolt	Lycoming HO-360-B1B piston, 180 hp (130 kW)
American Champion Citibria	Lycoming O-320-A2B, 150 hp (111.9 kW)
Pitts S-2	Textron Lycoming AEIO-540-D4A5 flat-six air cooled piston engine, 260 hp (194 kW)
RV-4	Lycoming O-320, O-360 or IO-360, 150-180hp (110-135 kW)
RV-6	Lycoming O-320 or Lycoming O-360 fixed pitch or constant speed, 150-180hp (112-134 kW)
Piper J-3	Continental A-65-8 air-cooled flat four, 65 hp (48 kW) at 2,350 rpm
Aviat Eagle	Lycoming AEIO-360-A1D, 200 hp (149 kW)
Great Lakes 2T	Lycoming engine
Lazer 230	piston engine
Stearman	radial engine

#### Mid Weight Piston

Aircraft Name	Engine
Zlin 242	Avia M 137A inverted 6 cylinder inline engine, 134 kW (180 hp)
American Champion 8KAB Decathlon	Lycoming AEIO-360-H1B CSU, 180 hp (134.2 kW)
RV-7	Lycoming O-320 or Lycoming O-360 Constant Speed or Fixed Pitch, 160 to 200 hp (119 to 149 kW)
RV-8	Lycoming O-320, Lycoming O-360 or Lycoming IO-360 fixed pitch or constant speed, 150-200hp (112-149 kW)
Cap 232	Lycoming AEIO-540-L1 B5D air-cooled flat-six, 224 kW (300 hp)
Edge 540	Modified Lycoming AEIO-540 Hartzell composite, 3 blade, 254 kW (340 hp)

Giles 202	Lycoming AEIO-360-A1E piston engine, 235 hp ()
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**High Weight Piston**

Aircraft Name	Engine
Grob G120	Lycoming AEIO-540-D4D5 6-cylinder, horizontally opposed engine, 194 kW (260 hp)
Extra 300	Lycoming AEIO-540-L1B5 MT-Propeller composite propeller (3- or 4-blade), 224 kW (300 hp)

**High Weight Radial**

Aircraft Name	Engine
Sukhoi 31	Vedeneyev M-14PF, 294 kW (400 hp)
Super solution	Pratt & Whitney R-1340 Radial, 535 hp (399 kW)
Yak 52	Vedeneyev M-14P 9-cylinder radial engine, 268 kW (360 hp)
Yak 55	Vedeneyev M14P 9-cylinder radial engine, 268.5 kW (360.1 hp)

**Mid Power Jet**

Aircraft Name	Engine
Aero Vodochody L39C	Ivchenko AI-25TL turbofan, 16.87 kN (3,792 lbf)
Dornie alpha jet	SNECMA Turbomeca Larzac 04-C5 turbofans, 13.24 kN (2,976 lbf) each
MiG 15 UTi	Klimov VK-1 turbojet, 26.5 kN (5,950 lbf)

**High Power Radial (Warbird)**

<b>Aircraft Name</b>	<b>Engine</b>
Hawker Sea Fury	Bristol Centaurus XVIIC 18-cylinder twin-row radial engine, 2,480 hp (1,850 kW)
North American T6	Pratt & Whitney R-1340-AN-1 Wasp radial engine, 600 hp (450 kW)
North American P51 Mustang	Packard V-1650-7 liquid-cooled supercharged V-12, 1,490 hp (1,111 kW) at 3,000 rpm; [76] 1,720 hp (1,282 kW)
Lockheed P-38	Allison V-1710-111/113 V-12 piston engine, 1,725 hp [N 7] (1,194 kW) each
Grumman 7F7	Pratt & Whitney R-2800-34W "Double Wasp" radial engines, 2,100 hp (1,566 kW) each
P-47	Pratt & Whitney R-2800-59 twin-row radial engine, 2,535 hp (1,890 kW)
Grumman F8F Bearcat	Pratt & Whitney R-2800-34W "Double Wasp" two-row radial engine, 2,100 hp (1,567 kW)
North American A36	Allison V-1710-87 liquid-cooled piston V12 engine, 1,325 hp (988 kW)
North American T28	Wright R-1820 single row radial 1425 hp

**High Power Jet**

<b>Aircraft Name</b>	<b>Engine</b>
F-15	Pratt & Whitney F100-100 or -220 afterburning turbofans
F-16	F110-GE-100 afterburning turbofan

## 17.2. CATEX 5-6.5q [CATEX1]

*The following procedures taken in accordance with Section 213 of the FAA Modernization and Reform Act of 2012, conducted at, above, or below 3,000 feet above ground level (AGL), unless there is a determination that extraordinary circumstances exist:*

- (1) Area Navigation/Required Navigation Performance (RNAV/RNP) procedures proposed for core airports and any medium or small hub airports located within the same metroplex area considered appropriate by the Administrator and*
- (2) RNP procedures proposed at 35 non-core airports selected by the Administrator (ATO)*

In December 2012, AEE issued Guidance for 5-6.5.q (aka CATEX1) titled, *Implementation of the Categorical Exclusion in Section 213(c)(1) of the FAA Modernization and Reform Act of 2012*. This guidance was later supplemented in July 2015, *Supplemental Guidance for Implementation of the Categorical Exclusion in Section 213(c)(1) of the FAA Modernization and Reform Act of 2012*. The first memo is Attachment A of the Supplemental Guidance.

This memo is still valid. The following pages contain the guidance memorandum in their original form.



## Federal Aviation Administration

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# Memorandum

### FAA Order 1050.1 Guidance Memo

Date: July 15, 2015

To: FAA Lines of Business and Managers with NEPA Responsibilities

From: Julie Marks, Manager, Environmental Policy and Operations, AEE-400

Subject: Supplemental Guidance for Implementation of the Categorical Exclusion in Section 213(c)(1) of the *FAA Modernization and Reform Act of 2012*

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In December 2012, AEE issued Guidance for Implementation of the Categorical Exclusion in Section 213(c)(1) of the FAA Modernization and Reform Act of 2012 (see Attachment A), hereafter referred to as CATEX1 Memo. This memorandum provides clarified guidance to:

- Provide more precision on the types of airports and procedures to which this CATEX may be applied;
- Provide guidance on appropriate airport operator and community engagement; and
- Require concurrence by the Office of Environment and Energy (AEE-400) and the Office of Chief Counsel (AGC-600) prior to the use of this CATEX.

### **Applicable Airports:**

#### *Core Airports:*

As the original CATEX1 Memo specified, the CATEX applies to Area Navigation System (RNAV) and Required Navigation Performance (RNP) and procedures at the 30 Core Airports and any medium or small hub airport located within the same metroplex area considered appropriate by the Administrator.

FAA has defined specific airport categories (including medium and small hub airports) based on number of enplanements<sup>1</sup>. The definitions are contained in 49 USC 47102(13) and (25), and provided below:

- A medium hub airport means a commercial service airport that has at least 0.25 but less than 1.0 percent of passenger boardings.

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<sup>1</sup> [http://www.faa.gov/airports/planning\\_capacity/passenger\\_allcargo\\_stats/categories/](http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/categories/)

- A small hub airport means a commercial service airport that has at least 0.05 percent but less than 0.25 percent of passenger boardings.
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- A list of the applicable Core Airports and the associated medium and small hub airports, to which this CATEX may potentially apply, are included in Attachment B. Note that CATEX1 does not apply to non-hub primary, non-primary commercial service, reliever or other general aviation airports. The FAA's Office of Airport Planning and Programming or regional Airports Divisions should be contacted to confirm the category of specific airports if there is any doubt.

### *35 Non-core Airports*

The CATEX can also be used for RNP procedures at 35 Non-OEP/Non-Core Airports listed in Attachment C.

### **Applicable Procedures:**

- The CATEX may only be used for applicable RNAV and RNP procedures, as follows:
  - FAA-identified RNAV and RNP procedures to be “developed, certified, published, or implemented” at Core airports, as well as at medium and small hub airports located within the same metroplex area as the Core Airports
  - FAA-identified RNP procedures to be “developed, certified, published or implemented” at non-Core Airports
- CATEX1 may not be used for new conventional procedures, or a combination of conventional procedures and applicable RNAV and RNP procedures. All instrument flight procedures in development, including procedures for which this CATEX may potentially apply, are available on FAA's Instrument Flight Procedures Information Gateway which is located at [https://www.faa.gov/air\\_traffic/flight\\_info/aeronav/procedures/](https://www.faa.gov/air_traffic/flight_info/aeronav/procedures/). If CATEX1 is being considered for a procedure, it should be confirmed that the procedure is listed on the Instrument Flight Procedures Information Gateway to fulfill the requirements of Section 213(c)(1) of the FAA Modernization and Reform Act of 2012.

As indicated in the original memo, before applying this CATEX, it must be determined that extraordinary circumstances do not exist and connected actions must be evaluated in conjunction with the proposed action to ensure cumulative impacts are appropriately evaluated.

### **Airport Operator and Community Engagement**

FAA collaboration with airport operators is critical during the planning and design of proposed RNP/RNAV procedures, and as part of determining the applicability of this CATEX. This collaboration should include consideration of appropriate FAA community engagement that would inform the affected public of proposed procedures and help identify community concerns.



**Required AEE and AGC Concurrence**

Due to the unique nature of this CATEX, all Lines of Business / Staff Offices must coordinate with and obtain written concurrence from AEE-400 and AGC-600 prior to applying this CATEX to a proposed action until further notice.

**Effective Date**

This supplemental guidance is effective immediately.

*For further information, contact:*

Julie Marks, Office of Environment and Energy, Manager, Environmental Policy and Operations (AEE-400), Federal Aviation Administration, 800 Independence Avenue, SW, Washington DC 20591, telephone (202) 267-3494

or

Michon Powell, Air Traffic Organization, Mission Support Services, Acting Manager, Environmental Policy Team (AJV-11), Federal Aviation Administration, 800 Independence Avenue, SW, Washington DC 20591, telephone (202) 267-9183.

**ATTACHMENT A**

Guidance for Implementation of the Categorical Exclusion in Section 213(c)(1) of the FAA  
Modernization and Reform Act of 2012

**Federal Aviation  
Administration**

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**Memorandum**

FAA Order 1050.1E, Change 1, Guidance Memo #5<sup>1</sup>

Date: December 6, 2012  
To: FAA Lines of Business and Managers with NEPA Responsibilities  
From: Julie Marks, Manager, Environmental Policy and Operations, AEE-400  
Subject: **Guidance for Implementation of the Categorical Exclusion in  
Section 213(c)(1) of the *FAA Modernization and Reform Act of 2012***

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This memorandum provides guidance to implement a new legislative categorical exclusion (213(c)(1)) CATEX) that was established by Congress in the FAA Modernization and Reform Act of 2012 ("Act"). Implementation of the 213(c)(1) CATEX is effective as of the date of this memorandum.

The CATEX in Section 213(c)(1) of the Act provides:

(c) COORDINATED AND EXPEDITED REVIEW.

"(1) In General.—Navigation performance and area navigation procedures developed, certified, published, or implemented under this section shall be presumed to be covered by a categorical exclusion (as defined in section 15084 of title 40, Code of Federal Regulations) under chapter 3 of FAA Order 1050.1E unless the Administrator determines that extraordinary circumstances exist with respect to the procedure."

**Implementing Instructions**

The 213(c)(1) CATEX is specific to procedures described under Section 213 of the Act at:

- 35 Operational Evolution Partnership (OEP) airports and any medium or small hub airport located within the same metroplex area considered appropriate by the Administrator,
- and at 35 non-OEP airports.

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<sup>1</sup> This document is guidance memo # 5 for FAA Order I050.1E (Change I). It is the fifth in a series of memos to provide additional guidance on FAA's NEPA requirements, procedures, and practices.

In March 2011 the FAA replaced the OEP with an initiative to incorporate NextGen technology into the National Airspace System based on the Core Airports (see Attachment I). The Core Airports consist of the 29 large hub airports plus Memphis International Airport. The FAA interprets the phrase '35 OEP airports in section 213 to refer to the 30 Core Airports. The FAA identified the RNA V and RNP to be "developed, certified, published, or implemented" at Core airports, as well as at medium and small hub airports located within the same metropolplex area as the Core Airports. to which this CATEX will potentially apply at the following website:

[http://www.faa.gov/air\\_traffic/flight\\_info/aeronav/procedures/reports/](http://www.faa.gov/air_traffic/flight_info/aeronav/procedures/reports/)

The FAA also identified the RNP to be "developed, certified , published or implemented" at non-Core Airports at this website pursuant to section 213 (b)(1). The 213(c)(1) CATEX does not apply to other types of proposed procedures or other airports. Most proposed air traffic procedures are covered by established CATEXes under paragraph 311 in Chapter 3 of FAA Order 1050. 1E, *Environmental Impacts: Policies and Procedures*. This new 213(c)(1) CATEX may be used for proposed RNP/RNAV procedures at the specified airports in addition to other CATEXes that may also apply.

FAA Order 1050. 1E lists two categories of procedures in paragraphs 401m and 401n that normally Require an Environmental Assessment (EA). These are:

"New instrument approach procedures, departure procedures, en route procedures, and modifications to currently approved instrument procedures which routinely l y route aircraft over noise sensitive areas at less than 3,000 feet above ground level (AGL)."

"New or revised air traffic control procedures which routinely route air traffic over noise sensitive areas at less than 3,000 feel AGL."

Proposed RNP/RNA V procedures that have to date normally required an EA under the provisions of Order 1050.1 E will, as of the date of the FAA Modernization And Reform Act of 2012, February 14, 2012, fall within the scope of the 213(c)(1) CATEX at the specified airports absent extraordinary circumstances. Procedures other than RNP/RNAV still fall under the provisions of paragraphs 401m and 401n.

The 2 13(c)(1) CATEX is subject to the same requirements as other CATEXes in Order 1050. 1E. The statutory language specifically states that the Administrator must determine if extraordinary circumstances exist before applying this legislative CATEX. Extraordinary circumstances exist when a proposed action involves one or more of the circumstances described under paragraph 304 of Order 1050. 1E and may have a significant impact. Screening<sup>2</sup> and other consultation or analyses that are performed to determine the potential for extraordinary circumstances apply to the 2 13(c)( 1 ) CATEX. just as they do to other procedural CATEXes. If extraordinary circumstances do not exist, FAA's environmental review will be completed with a documented CATEX that includes the results of screening and any other reviews that were performed (i.e., an EA will not be prepared) . If extraordinary

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<sup>2</sup> Screening is a process where a first order analysis is performed to determine if there is a potential for significant environmental impacts. Screening can be completed using FAA approved look up tables and/or screening tools. Specific guidance around the appropriate use of the different screening mechanisms and the interpretations of the results exist and should be referenced during the screening process.

circumstances are found to exist. FAA will prepare an EA or Environmental Impact Statement (EIS) in accordance with Order 1050.1E.

Council on Environmental Quality (CEQ) regulations implementing the National Environmental Policy Act (NEPA) governing cumulative effects and connected actions continue to apply to proposed RNAV and RNP procedures at the specified airports. Proposed RNP/RNAV procedures at the specified airports must not be inappropriately segmented from larger projects or evaluated in isolation from potential cumulative effects with other proposed agency actions (e.g., conventional and PBN procedures for implementation at the same location and the same time, or runway development and associated PBN procedures). Environmental laws in addition to NEPA also continue to apply if they are relevant, e.g. the Clean Air Act.

### **Background**

FAA Order 1050.1E (Change 1) *Environmental Impacts: Policies and Procedures* (March 20, 2006) establishes agency-wide policies and procedures for compliance with NEPA and the implementing regulations issued by CEQ (40 CFR parts 1500-1508). CATEXes are categories of actions which do not individually or cumulatively have a significant effect on the environment and are, therefore, not subject to further review in an EA or EIS. A CATEX is not an exemption from NEPA review. Proposed actions that fall under CATEXes are subject to a sufficient amount of review to allow the FAA to determine that no extraordinary circumstances apply that would require more detailed environmental review with an EA or EIS.

The 213(c)(1) CATEX was created by Congress with the intent to expedite environmental reviews of proposed RNP/RNAV procedures at certain airports. We expect this will be achieved through the ability to use more documented CATEXes for these procedures in lieu of EAs that are concluded with Findings of No Significant Impact (FONSIs). Some concern has been expressed that the 213(c)(1) CATEX enables NextGen procedures to be implemented without appropriate consideration of potential environmental impacts, especially noise impacts. The Act addresses this concern by placing the 213(c)(1) CATEX within the context of FAA Order 1050.1E and making the 213(c)(1) CATEX subject to extraordinary circumstances. Noise screening and other environmental reviews that apply to the FAA's administratively established CATEXes also apply to the 213(c)(1) CATEX. Proposed procedures that would trigger extraordinary circumstances, including significant noise impacts, cannot be CATEXed.

The Act includes a second legislative CATEX in Section 213(c)(2). This second CATEX is subject to future guidance and is not within the scope of this memorandum.

### **Effective Date**

The use of the legislative CATEX in Section 213(c)(1) of the FAA Modernization and Reform Act of 2012 was dependent on FAA identifying the procedures and airports to which this CATEX will potentially apply. Since FAA has identified the procedures and airports at the above referenced FAA website, the CATEX can now be used and is effective immediately. The CATEX will also be incorporated into the revision of Order 1050.1E.

**For further information, contact:**

Julie Marks, Office of Environment and Energy, Manager, Environmental Policy and Operations (AEE-400), Federal Aviation Administration . 800 Independence Avenue. SW. Washington DC 20591, telephone (202) 267-494

or

Donna Warren, Air Traffic Organization , Mission Support Services, Manager, Environmental Policy Team (AJV- 114). Federal Aviation Administration, 800 Independence Avenue, SW. Washington DC 20591, telephone (202) 267-9183.

**ATTACHMENT 1****FAA Core Airports**

- 1) Hartsfield-Jackson Atlanta
- 2) Boston Logan
- 3) Thurgood Marshall Baltimore- Washington
- 4) Charlotte Douglas
- 5) Ronald Reagan Washington National
- 6) Denver
- 7) Dallas-Fort Worth
- 8) Detroit Metropolitan-Wayne County
- 9) Newark
- 10) Fort Lauderdale-Hollywood
- 11) Honolulu
- 12) Washington Dulles
- 13) George Bush
- 14) John F. Kennedy
- 15) McCarran
- 16) Los Angeles
- 17) LaGuardia
- 18) Orlando
- 19) Chicago Midway
- 20) Memphis
- 21) Miami
- 22) Minneapolis-St. Paul
- 23) Chicago O'Hare
- 24) Philadelphia
- 25) Phoenix Sky Harbor
- 26) San Diego-Lindbergh Field
- 27) Seattle-Tacoma
- 28) San Francisco
- 29) Salt Lake City
- 30) Tampa

**ATTACHMENT B****List of CATEX 1 Applicable****Core Airports and the Associated Medium and Small Hub Airports**

Core Airports	Metroplex	Medium Hub Airports	Small Hub Airports
Hartsfield-Jackson Atlanta	Atlanta		
Boston Logan	Boston	Bradley International Airport; T.F. Green Airport	Manchester-Boston Regional Airport
Thurgood Marshall Baltimore-Washington	D.C.		
Charlotte Douglas	Charlotte	Raleigh-Durham International	Columbia Metropolitan; Piedmont Triad International; Greenville-Spartanburg
Ronald Reagan Washington National	D.C.		
Denver	Denver		
Dallas-Fort Worth	North Texas	Dallas Love Field	
Detroit Metropolitan-Wayne County	Detroit		
Newark	New York/ Philadelphia		Westchester County; Long Island MacArthur
Fort Lauderdale-Hollywood	South Florida		
Honolulu	Honolulu		
Washington Dulles	D.C.		
George Bush	Houston	William P. Hobby	
John F. Kennedy	New York/ Philadelphia		Westchester County; Long Island MacArthur
McCarran	Las Vegas Valley		
Los Angeles	Southern California	Bob Hope; Ontario International; John Wayne Airport-Orange County Airport	Long Beach; Palm Springs International
LaGuardia	New York/ Philadelphia		Westchester County; Long Island MacArthur
Orlando	Orlando		Orlando Sanford

Core Airports	Metroplex	Medium Hub Airports	Small Hub Airports
			International
Chicago Midway	Chicago	General Mitchell International	
Memphis	Memphis		
Miami	South Florida		
Minneapolis-St Paul	Minneapolis-St. Paul		
Chicago O'Hare	Chicago	General Mitchell International	
Philadelphia	New York/Philadelphia		Westchester County; Long Island MacArthur
Phoenix Sky Harbor	Phoenix		Phoenix-Mesa Gateway
San Diego-Lindbergh Field	Southern California	Bob Hope; Ontario International; John Wayne Airport-Orange County Airport	Long Beach; Palm Springs International
Seattle-Tacoma	Seattle		
San Francisco	Northern California	Norman Y. Mineta San Jose International; Sacramento International	Oakland International
Salt Lake City	Salt Lake City		
Tampa	Tampa		St. Petersburg-Clearwater International; Sarasota/Bradenton International

Note: This list is current as of the effective date of this memorandum. When considering use of CATEX1, the current list of Core Airports could potentially change and should be reviewed at <http://www.faa.gov/nextgen/snapshots/airport/>.



**ATTACHMENT C**  
**List of CATEX 1 Applicable**  
**Non-OEP/Non-Core Airports**

Airport Code	Airport Name
1V6	Fremont County Airport
ABQ	Albuquerque International Sunport
ALB	Albany International Airport
ANC	Ted Stevens Anchorage International Airport
APF	Naples Municipal Airport
AUS	Bergstrom International Airport
BCT	Boca Raton Airport
BED	Laurence G Hanscom Field Airport
BHM	Birmingham-Shuttlesworth International Airport
BIL	Billings Logan International Airport
BLI	Bellingham International Airport
BNA	Nashville International Airport
CHS	Charleston International Airport
CMH	Port Columbus International Airport
CRW	Yeager Airport
DAL	Dallas Love Field Airport
ECP	Northwest Florida Beaches International Airport
ELP	El Paso International Airport
FAI	Fairbanks International Airport
HRL	Valley International Airport
HTO	East Hampton Airport
IND	Indianapolis International Airport
IWA	Phoenix-Mesa Gateway Airport
JAX	Jacksonville International Airport
MCI	Kansas City International Airport
MHT	Manchester-Boston Regional Airport
OMA	Eppley Airfield Airport
PRC	Prescott Municipal Airport
PUW	Pullman-Moscow Regional Airport
PVD	Green Airport
RIC	Richmond International Airport
SDF	Louisville International Airport
SMF	Sacramento International Airport
SMO	Santa Monica Municipal Airport
TTN	Trenton Mercer Airport

### 17.3. CATEX 5-6.5r [CATEX2]

*Any navigation performance or other performance based navigation procedure that, in the determination of the Administrator, would result in measurable reductions in fuel consumption, carbon dioxide emissions, and noise, on a per flight basis, as compared to aircraft operations that follow existing instrument flight rules procedures in the same airspace. This CATEX may be used irrespective of the altitude of such procedures.<sup>1</sup> (ATO)*

Implementation Guidance for CATEX 5-6.5r (aka CATEX 2) is forthcoming.

**Do not use this CATEX until  
implementation guidance is issued.**

## Appendix A. References and Cited Publications

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## Appendix B. Other Environmental Laws and Requirements

Federal activities affecting all environmental impact categories are governed by many statutes, regulations, and Executive Orders. Each impact category chapter of this Desk Reference (Chapters 1-14, as applicable) contains an exhibit with a tabular overview of the major applicable Federal statutes, regulations, Executive Orders, and the agencies responsible for overseeing their implementation. This appendix supplements the background information relevant to those requirements that is provided in the chapter exhibits. Please note that these requirements may not be applicable to every FAA action, and should only be included when relevant to the proposed project.

### B.1. Air Quality

The Clean Air Act (CAA) is the comprehensive Federal law that regulates the emission of air pollutants from stationary and mobile sources. Among other things, the CAA authorizes the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) for common air pollutants (known as “criteria pollutants”) to protect public health and welfare, and to regulate emissions of hazardous air pollutants (HAPs).

As stated in Chapter 1, electronic sources that may be useful when describing the affected environment for air quality include:

- FAA guidance documents on HAPs and climate change available at: [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/);
- EPA’s CAA website at: <http://www.epa.gov/air/caa/>;
- EPA’s General Conformity guidance, including specific guidance for airports at: <http://www.epa.gov/air/genconform/background.html>;
- EPA’s Air Toxics (i.e., HAPs) website at: <http://www.epa.gov/ttn/atw/>; and
- For the attainment status of the study area for Federal and state air quality standards, visit the applicable state air quality management agency’s website. For example, if a study area is in California, go to the California Air Resources Board Area Designations Maps / State and National website at: <http://www.arb.ca.gov/desig/adm/adm.htm>. Additionally, the EPA’s *Green Book Nonattainment Areas for Criteria Pollutants* identifies areas of the country that have not attained air quality standards for criteria pollutants.

#### B.1.1. Pollutants, Sources, and Health Effects

##### B.1.1.1. Criteria Pollutants

Criteria pollutants are those pollutants that are common and found all over the United States. The EPA calls these pollutants “criteria” air pollutants because it regulates them by developing human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels (see *National Ambient Air Quality Standards* discussion below). The EPA uses measurements of criteria pollutants as indicators of air quality. The EPA has identified six

criteria pollutants: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM) with an aerodynamic diameter equal to or less than 10 microns (PM<sub>10</sub>, or coarse particles) and 2.5 microns (PM<sub>2.5</sub>, or fine particles), sulfur dioxide (SO<sub>2</sub>), and lead (Pb). These pollutants can harm human health and the environment and cause property damage. According to EPA, of the six criteria pollutants, PM and ozone are the most widespread health threats.<sup>1</sup>

### **B.1.1.2. Hazardous Air Pollutants**

In addition to the criteria pollutants, Section 112 of the CAA authorizes the EPA to regulate emissions of HAPs, also known as toxic air pollutants or air toxics. HAPs are pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects. No NAAQS have been established for HAPs (except for lead, which is regulated as a criteria pollutant and as a HAP). At present, the EPA is required to control 187 HAPs. A complete list of the regulated HAPs can be found on EPA's Air Toxics website at: <http://www.epa.gov/ttn/atw/orig189.html>. In addition, information regarding HAPs is available on the FAA's Environmental Policy website at: [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/). For example, see [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/media/HAPs\\_rpt.pdf](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/HAPs_rpt.pdf) for a bibliography on HAPs associated with aviation.

### **B.1.1.3. National Ambient Air Quality Standards**

The NAAQS are air quality standards set by the EPA for criteria pollutants that are among the most harmful to public health and the environment. The CAA directs the states to develop plans (see *State Implementation Plans* discussion below) in order to achieve these standards.

The EPA has established a set of NAAQS for the six criteria pollutants listed above. There are primary and secondary NAAQS for most of the criteria pollutants (see Exhibit B-1 below). The primary standards were established to protect the public health with an adequate margin of safety. The secondary standards were established to protect the public welfare from any known or anticipated adverse effects of a pollutant (e.g., damage to crops and materials). Compliance with the NAAQS means the ambient outdoor levels of the criteria air pollutants are presumed safe for human health, public welfare, and the environment.

Under the CAA, states are allowed to adopt their own ambient air quality standards, provided their proposed standards are at least as stringent as the NAAQS. Similarly, state standards may include additional pollutants that are not regulated under the NAAQS. For example, the California Ambient Air Quality Standards established under the California Clean Air Act of 1988 are generally different from and more stringent than the NAAQS. Furthermore, in addition to the six pollutants regulated under the NAAQS, the California Ambient Air Quality Standards set acceptable levels for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles.

Federal actions that are implemented in states that have separate state ambient air quality standards are required to comply with state ambient air quality standards in the same way they are required to comply with the NAAQS. The EPA's established NAAQS are displayed in Exhibit B-1 below.

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<sup>1</sup> <http://www.epa.gov/air/urbanair/>

**Exhibit B-1. National Ambient Air Quality Standards<sup>a</sup>**

<b>Pollutants</b>	<b>Primary Standards Value</b>	<b>Primary Standards Averaging Period</b>	<b>Secondary Standards</b>
CO	9 ppm (10 mg/m <sup>3</sup> )	8 hours	None
CO	35 ppm (40 mg/m <sup>3</sup> )	1 hour	None
NO <sub>2</sub>	53 ppb	Annual (Arithmetic average)	Same as primary
NO <sub>2</sub>	100 ppb	1 hour	None
O <sub>3</sub>	0.075 ppm	8 hours	Same as primary
PM <sub>10</sub>	150 µg/m <sup>3</sup>	24 hours	Same as primary
PM <sub>2.5</sub>	15.0 µg/m <sup>3</sup>	Annual (Arithmetic average)	Same as primary
PM <sub>2.5</sub>	35 µg/m <sup>3</sup>	24 hours	Same as primary
SO <sub>2</sub>	75 ppb	1 hour	None
SO <sub>2</sub>	None	None	500 ppb average period of 3 hours
Pb	0.15 µg/m <sup>3</sup>	Rolling 3-month average	Same as primary

Source: EPA's NAAQS website at: <http://www.epa.gov/air/criteria.html>. The information in the table is current as of September 2012. Please refer to the website to check for updates as well as to review additional notes that pertain to these standards. The standards are codified at 40 Code of Federal Regulations (CFR) part 50.

<sup>a</sup> CO = carbon monoxide; Pb = lead; NO<sub>2</sub> = nitrogen dioxide; PM<sub>10</sub> and PM<sub>2.5</sub> = particulate matter with an aerodynamic diameter equal to or less than 10 microns and 2.5 microns, respectively; O<sub>3</sub> = ozone; SO<sub>2</sub> = sulfur dioxide; mg/m<sup>3</sup> = milligram per cubic meter; ppb = part per billion; ppm = part per million; µg/m<sup>3</sup> = microgram per cubic meter

***Designation of Areas by Air Quality Status***

To further define local and regional air quality, the EPA has divided the country into areas that achieve the NAAQS, called *attainment areas*, and those that do not achieve the NAAQS, called *nonattainment areas*. The nonattainment and attainment designations are based on air quality monitoring data. Areas for which available data are not sufficient to make an attainment status designation are listed as *unclassifiable*.<sup>2</sup> Unclassifiable areas are treated as attainment areas for regulatory purposes. Areas that were previously designated nonattainment and subsequently re-designated to attainment due to meeting the NAAQS are classified as *maintenance areas*. The official list of nonattainment, attainment, maintenance, and unclassified areas and a description of their boundaries is available at 40 CFR part 81. The EPA maintains an unofficial list of these

<sup>2</sup> Areas designated unclassifiable sometimes are referred to as "unclassified" though this term is not used in the Clean Air Act (CAA).

areas on its Green Book website at: <http://www.epa.gov/oar/oaqps/greenbk/>. The EPA publishes notices on its Green Book website when the status of a nonattainment area changes. The EPA also tracks *Federal Register* notices regarding status changes (see the EPA's Green Book website at: <http://www.epa.gov/oar/oaqps/greenbk/adden.html>). The EPA's Green Book website should be checked when assessing the attainment status of the study area.

### ***State Implementation Plans***

The responsibility for designating areas that are in attainment, nonattainment, or maintenance for each of the criteria pollutants has been delegated to the states by the EPA. States are required to develop EPA-approved State Implementation Plans (SIPs) to achieve or maintain the NAAQS within timeframes set under the CAA. The SIP documents how the region will reach attainment by the required date. The SIP includes inventories of emissions within the area and establishes emissions budgets (the emissions levels or targets required for the area to reach attainment) designed to bring the area into compliance with the NAAQS. In maintenance areas, the SIP documents how the state intends to maintain compliance with the NAAQS. The SIP accounts for all the emissions within the Federally-designated air quality management area that affect air quality. To comply with the SIP, a Federal action must not result in any new violations or worsen any existing violations of the NAAQS or state standards, must not delay timely attainment of any standard or any required interim emission reductions or other milestones, and must meet the conditions of the general conformity regulations (discussed below). If a state fails to submit an adequate SIP or fails to implement an approved SIP, the EPA is required to promulgate a Federal Implementation Plan (FIP).

***State Implementation Plan*** – A state's detailed description of the regulations, programs, and measures the state will use to reduce air pollution in the state and to fulfill its responsibilities under the Clean Air Act to attain the NAAQS for all criteria air pollutants in the state within legally required timeframes.

#### **B.1.1.4. Conformity**

Conformity is defined as conformity to the SIP's (or FIP's) purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. It requires that Federal activities will not:

1. Cause or contribute to any new violation of any standard in any area;
2. Increase the frequency or severity of any existing violation of any standard in any area; or
3. Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Conformity typically is evaluated using an emissions analysis.

#### ***Purpose***

Section 176(c) of the CAA requires that Federal actions conform to the appropriate SIPs or FIPs in order to attain the CAA's air quality goals. Section 176(c) states that no Federal entity shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not "conform" to the applicable SIP or FIP. The purpose of this conformity requirement is to ensure that Federal activities: (1) do not interfere with the budgets

in the SIPs; (2) do not cause or contribute to new violations of the NAAQS; and (3) do not impede the ability to attain or maintain the NAAQS.

### ***Applicability***

To implement Section 176(c), the EPA issued the Transportation Conformity Rule (40 CFR part 93, subpart A) which applies to Federal actions funded under United States Code (U.S.C.) Title 23 or the Federal Transit Act, and the General Conformity Rule (40 CFR part 93, Subpart B) which applies to all other Federal actions. Actions that are subject to the Transportation Conformity Rule generally involve highway or transit projects and are not related to aviation, with some exceptions (see *Transportation Conformity* discussion below). Most FAA actions that are subject to conformity will be subject only to the General Conformity Rule. The conformity rules apply only to Federal actions in nonattainment or maintenance areas.

### ***General Conformity***

The General Conformity Rule was published in the *Federal Register* on November 30, 1993, and amended on April 5, 2010. A summary of the rule and amendments can be found in the EPA's General Conformity Training Module at: [http://www.epa.gov/airquality/genconform/training/09\\_AppendixB.html](http://www.epa.gov/airquality/genconform/training/09_AppendixB.html).

The General Conformity Rule established a process based on emissions analysis to determine whether a Federal action conforms to the SIP. The rule defines emissions as “direct” or “indirect” (see 40 CFR § 93.152). Actions that do not meet the definitions of direct or indirect emissions are exempt from the General Conformity Rule. “Direct emissions” are those that occur at the same time and place as the Federal action. The definition of “indirect emissions” contains four criteria, all of which must be met. As stated in 40 CFR § 93.152, indirect emissions means those emissions of a criteria pollutant or its precursors:

- That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place from the action;
- That are reasonably foreseeable;
- That the agency can practically control; and
- For which the agency has continuing program responsibility.

When developing the General Conformity Rule, the EPA recognized that many actions conducted by Federal agencies do not result in substantial increases in air pollutant emissions in nonattainment and maintenance areas. Therefore, the EPA established threshold levels (also referred to as *de minimis* levels) for emissions of each of the criteria pollutants. When the sum of the increases in direct and indirect emissions caused by a project would be less than the *de minimis* levels, a project would not require a general conformity determination. The general conformity *de minimis* levels for the criteria pollutants are displayed in Exhibit B-2 and B-3 below.

**Exhibit B-2. Nonattainment Areas General Conformity De Minimis Emission Levels<sup>a</sup>**

Pollutant (Precursor)	Area Type	Tons per Year
O <sub>3</sub> (VOC or NO <sub>x</sub> )	Serious	50
O <sub>3</sub> (VOC or NO <sub>x</sub> )	Severe	25
O <sub>3</sub> (VOC or NO <sub>x</sub> )	Extreme	10
O <sub>3</sub> (VOC or NO <sub>x</sub> )	Marginal and moderate ozone nonattainment areas outside an ozone transport region	100
O <sub>3</sub> (NO <sub>x</sub> )	Marginal and moderate ozone nonattainment areas inside an ozone transport region	100
O <sub>3</sub> (VOC)	Marginal and moderate ozone nonattainment areas inside an ozone transport region	50
CO, SO <sub>2</sub> , or NO <sub>2</sub>	All nonattainment areas	100
PM <sub>10</sub>	Moderate	100
PM <sub>10</sub>	Serious	70
PM <sub>2.5</sub> (Direct emissions)	All PM <sub>2.5</sub> nonattainment areas	100
PM <sub>2.5</sub> (SO <sub>2</sub> )	All PM <sub>2.5</sub> nonattainment areas	100
PM <sub>2.5</sub> (NO <sub>x</sub> , unless determined not to be a significant precursor)	All PM <sub>2.5</sub> nonattainment areas	100
PM <sub>2.5</sub> (VOC or ammonia, if determined to be significant precursors)	All PM <sub>2.5</sub> nonattainment areas	100
Pb	All Pb nonattainment areas	25

Source: 40 CFR § 93.153 as presented in EPA. 2011. General Conformity *De Minimis* Levels.

<http://www.epa.gov/airquality/genconform/deminimis.html> (last updated July 22, 2011).

<sup>a</sup> CO = carbon monoxide; NO<sub>x</sub> = nitrogen oxides; NO<sub>2</sub> = nitrogen dioxide; O<sub>3</sub> = ozone; Pb = lead; PM<sub>10</sub> = particulate matter with an aerodynamic diameter equal to or less than 10 microns; PM<sub>2.5</sub> = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound.



**Exhibit B-3. Maintenance Areas General Conformity De Minimis Emission Levels<sup>a</sup>**

<b>Pollutant (Precursor)</b>	<b>Area Type</b>	<b>Tons per Year</b>
Ozone (NO <sub>x</sub> , SO <sub>2</sub> , or NO <sub>2</sub> )	All ozone maintenance areas	100
Ozone (VOCs)	Ozone maintenance areas inside an ozone transport region	50
Ozone (VOCs)	Ozone maintenance areas outside an ozone transport region	100
CO or PM <sub>10</sub>	All maintenance areas	100
PM <sub>2.5</sub> (Direct emissions)	All PM <sub>2.5</sub> maintenance areas	100
PM <sub>2.5</sub> (SO <sub>2</sub> )	All PM <sub>2.5</sub> maintenance areas	100
PM <sub>2.5</sub> (NO <sub>x</sub> , unless determined not to be a significant precursor)	All PM <sub>2.5</sub> maintenance areas	100
PM <sub>2.5</sub> (VOC or ammonia, if determined to be significant precursors)	All PM <sub>2.5</sub> maintenance areas	100
Pb	All Pb maintenance areas	25

Source: 40 CFR § 93.153 as presented in EPA, 2011. General Conformity *De Minimis* Levels. <http://www.epa.gov/airquality/genconform/deminimis.html> (last updated July 22, 2011).

<sup>a</sup> CO = carbon monoxide; NO<sub>x</sub> = nitrogen oxides; NO<sub>2</sub> = nitrogen dioxide; O<sub>3</sub> = ozone; Pb = lead; PM<sub>10</sub> = particulate matter with an aerodynamic diameter equal to or less than 10 microns; PM<sub>2.5</sub> = particulate matter with an aerodynamic diameter equal to or less than 2.5 microns; SO<sub>2</sub> = sulfur dioxide; VOC = volatile organic compound.

***Transportation Conformity***

The EPA issued the Transportation Conformity Rule (see 40 CFR part 93, subpart A) to address conformity of highway, roadway, and transit plans and projects. Most Federal actions that are funded under U.S.C. Title 23 or the Federal Transit Act, and are therefore subject to transportation conformity, are sponsored by the Federal Highway Administration (FHWA) or the Federal Transit Administration. As noted above, most FAA actions to which conformity applies are subject only to the General Conformity Rule. However, some projects involving airport ground access that are funded under U.S.C. Title 23 or the Federal Transit Act may also be subject to the Transportation Conformity Rule. If any part of a project would be funded through U.S.C. Title 23 or the Federal Transit Act, the appropriate FAA Line of Business/Staff Office (LOB/SO) should be consulted with to determine how the Federal action should comply with the Transportation Conformity Rule.

### ***Exemptions***

Certain Federal actions are exempt from the requirements of the General Conformity Rule because they result in no emissions or minimal emissions. These include, but are not limited to the following (see 40 CFR § 93.153[c][2] for the complete list of actions):

- Continuing and recurring activities such as permit renewals where activities conducted will be similar in scope and operation to activities currently being conducted (40 CFR § 93.153[c][ii]);
- Routine maintenance and repair activities, including repair and maintenance of administrative sites, roads, trails, and facilities (40 CFR § 93.153[c][iv]);
- Routine operation of facilities, mobile assets, and equipment (40 CFR § 93.153[c][xiii]);
- Administrative actions such as personnel actions, organizational changes, debt management or collection, cash management, internal agency audits, program budget proposals, and matters relating to the administration and collection of taxes, duties, and fees (40 CFR § 93.153[c][vi]);
- Planning, studies, and provision of technical assistance (40 CFR § 93.153[c][xii]);
- The routine, recurring transportation of material and personnel (40 CFR § 93.153[c][vii]);
- Transfers of ownership, interests, and titles in land, facilities, and real and personal properties, regardless of the form or method of the transfer (40 CFR § 93.153[c][xiv]);
- Actions, such as the following, with respect to existing structures, properties, facilities, and lands where future activities conducted will be similar in scope and operation to activities currently being conducted at the existing structures, properties, facilities, and lands; for example, relocation of personnel, disposition of Federally-owned existing structures, properties, facilities, and lands, rent subsidies, operation and maintenance cost subsidies, the exercise of receivership or conservatorship authority, and assistance in purchasing structures (40 CFR § 93.153[c][x]);
- Civil and criminal enforcement activities, such as investigations, audits, inspections, examinations, prosecutions, and the training of law enforcement personnel (40 CFR § 93.153[c][v]); and
- Air traffic control activities and adopting approach, departure, and en route procedures for aircraft operations above the mixing height specified in the applicable SIP. Where the applicable SIP does not specify a mixing height, the FAA or applicant, as appropriate, can use the 3,000 feet above ground level (AGL) as a default mixing height, unless the FAA or applicant, as appropriate, demonstrates that use of a different mixing height is appropriate because the change in emissions at and above that height caused by the Federal action is *de minimis* (40 CFR § 93.153[c][xxii]).

### ***Actions Presumed to Conform***

In addition, the General Conformity Rule contains a provision that allows agencies to develop a list of actions presumed to conform which would be exempt from the requirements of the rule. The FAA published a list of actions presumed to conform at 72 *Federal Register* 41565-41580 (July 30, 2007); see <http://edocket.access.gpo.gov/2007/pdf/07-3695.pdf>. FAA actions presumed to conform consist of the following:

1. Pavement markings;

2. Pavement monitoring systems;
3. Non-runway pavement work;
4. Aircraft gate areas on airside;
5. Lighting systems;
6. Terminal and concourse upgrades;
7. New HVAC systems, upgrades, and expansions;
8. Airport security;
9. Airport safety;
10. Airport maintenance facilities;
11. Airport signage;
12. Commercial vehicle staging areas;
13. Low-emission technology and alternative fuel vehicles;
14. Airspace and air traffic control activities (e.g., adopting approach, departure, and en route procedures) for air operations that occur at altitudes above the atmospheric mixing height<sup>3</sup>; and air traffic control activities for air operations that occur at altitudes below the atmospheric mixing height, provided that modifications to routes and procedures are designed to enhance operational efficiency (i.e., to reduce delay), increase fuel efficiency, or reduce community noise impacts by means of engine thrust reductions; and
15. Routine installation and operation of aviation navigation aids.

For descriptions of the actions listed above, please see the FAA *Federal Register* notice.

## **B.2. Biological Resources**

The following statutes, Executive Orders, and memorandum govern the protection of biological resources.

### **B.2.1. Bald and Golden Eagle Protection Act**

The Bald and Golden Eagle Protection Act, administered by the U.S. Fish and Wildlife Service (USFWS), protects bald and golden eagles from the unauthorized capture, purchase, or transportation of the birds, their nests, or their eggs. Any action that might disturb these species requires a permit from the USFWS, which authorizes limited, non-purposeful take of bald and golden eagles. In limited cases, a permit may authorize the physical take of eagles, but only if every precaution is taken to avoid physical take. Removal of eagle nests is typically only

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<sup>3</sup>The FAA interprets this presumption of conformity also to apply to emissions from commercial space launch vehicles and associated aircraft operations that occur at altitudes above the atmospheric mixing height.

allowed when necessary to protect human safety or the safety of the eagles. Coordination with the USFWS may be necessary if a proposed project has the potential to affect bald or golden eagles.

For additional information, see the following links:

- Information on Bald Eagle Management: <http://www.fws.gov/migratorybirds/baldeagle.htm>
- Federal Laws protecting Eagles: <http://www.fws.gov/midwest/eagle/protect/laws.html>
- Information on Eagle Permits: <http://www.fws.gov/midwest/MidwestBird/EaglePermits/index.html>

### B.2.2. Endangered Species Act

The USFWS and the National Marine Fisheries Service (NMFS) (collectively known as “the Services”) jointly administer the Endangered Species Act of 1973 (ESA), which requires all Federal agencies to seek to conserve threatened and endangered species. In general, the USFWS has jurisdiction over Federally-listed terrestrial and freshwater species, and the NMFS has jurisdiction over Federally-listed marine and anadromous species.<sup>4</sup> The ESA provides the following definitions of threatened and endangered species:

- **Threatened species.** Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- **Endangered species.** Any plant or animal species that is in danger of extinction throughout all or a significant portion of its range.

Those species that are considered for possible addition to the list of threatened and endangered species are known as *candidate species*. Candidate species are not afforded regulatory protection under the ESA; however, these species are still important to include in the NEPA review as they may be listed in the foreseeable future. *Proposed species* are any species proposed to be listed as threatened or endangered, and are provided protection under the ESA.

Under the ESA, the Services are also required to designate *critical habitat* for listed species at the time of or within one year of each species’ listing.<sup>5</sup> Critical habitat is defined as specific areas within the geographic area occupied by the species at the time it is listed, which contain the physical or biological features essential to conservation of the species and that might require special management considerations or protection. Critical habitat also includes specific areas outside the geographic area occupied by the species if the Services determine that the area itself is essential for conservation of the species.

The most relevant section of the ESA to FAA actions is Section 7(a)(2), which requires Federal agencies, in consultation with the Services, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. As a result, the FAA must consult with the Services prior to taking any action that has the potential to affect listed

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<sup>4</sup> The USFWS and NMFS have joint jurisdiction over some species, including sea turtles and certain fish species.

<sup>5</sup> Designation of critical habitat for a species usually does not occur within a year.

species. In addition, if a proposed project has the potential to impact a proposed species or proposed critical habitat, the FAA must confer with the Services under Section 7(a)(4).

For additional information on the ESA, see the following links:

- Endangered Species Act information: <http://www.fws.gov/endangered/laws-policies/index.html>
- Information on Endangered Species: <http://www.fws.gov/endangered/>
- Link to Information, Planning, and Conservation System (IPaC) database: <http://ecos.fws.gov/ipac/>

### **B.2.3. Fish and Wildlife Coordination Act**

The Fish and Wildlife Coordination Act of 1958 requires that Federal agencies consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed Federal projects may result in control or modification of the water of any stream or other water body. This Act provides for financial and technical assistance to states to develop conservation plans, subject to approval by the U.S. Department of the Interior (DOI), and implement state programs for fish and wildlife resources. The Act also encourages all Federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and to promote the conservation of non-game fish and wildlife and their habitats. Coordination with the USFWS and state wildlife agencies may be necessary if a proposed project has the potential to impact applicable water bodies.

For additional information on the Fish and Wildlife Coordination Act, see <http://www.fws.gov/laws/lawsdigest/fwcoord.html>

### **B.2.4. Magnuson-Stevens Fishery Conservation and Management Act**

The Magnuson-Stevens Fishery Conservation and Management Act governs the conservation and management of ocean fishing, including *essential fish habitat*.<sup>6</sup> Implemented by the NMFS, this Act establishes eight Regional Fishery Management Councils who are responsible for: (1) describing and identifying essential fish habitat in their respective regions; (2) specifying actions to conserve and enhance essential fish habitat; and (3) minimizing the adverse effects of fishing in essential fish habitat. The Magnuson-Stevens Fishery Conservation and Management Act also establishes exclusive U.S. management authority over all fishing within the U.S. exclusive economic zone,<sup>7</sup> all anadromous fish throughout their migratory range (except when in a foreign nation's waters), and all fish on the Continental Shelf. Consultation with the NMFS may be necessary if a proposed project has the potential to impact essential fish habitat.

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<sup>6</sup> Essential fish habitat is defined as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."

<sup>7</sup> The exclusive economic zone is the zone where the United States and other coastal nations have jurisdiction over economic and resource management. The exclusive economic zone includes waters 3 to 200 miles offshore (or 9 to 200 miles offshore in western Florida and Texas). Coastal states are responsible for inshore waters out to 3 miles off the coast (or 9 miles off the west coast of Florida and Texas).

For additional information on the Magnuson-Stevens Fishery Conservation and Management Act, see <http://www.nmfs.noaa.gov/msa2007/>.

### **B.2.5. Marine Mammal Protection Act**

The Services also jointly administer the Marine Mammal Protection Act (MMPA) of 1972. The MMPA protects all marine mammals and prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens on the high seas. In addition, the MMPA prohibits the importation of marine mammals and marine mammal products into the United States. Under the MMPA, the USFWS has jurisdiction over sea and marine otters, walruses, polar bears, three species of manatees, and dugongs; the NMFS has jurisdiction over sea lions, whales, and dolphins. Consultation with the Services may be necessary if a proposed project has the potential to impact marine mammals.

For additional information on the MMPA, including links to MMPA regulations and descriptions of marine mammals, see <http://www.nmfs.noaa.gov/pr/laws/mmpa/> and <http://www.fws.gov/international/animals/marine-mammals.html>.

### **B.2.6. Migratory Bird Treaty Act**

The Migratory Bird Treaty Act of 1918 protects migratory birds by prohibiting private parties (and Federal agencies in certain judicial circuits) from intentionally taking,<sup>8</sup> selling, or conducting other activities that would harm migratory birds, their eggs, or nests (such as removal of an active nest or nest tree), unless the Secretary of the Interior authorizes such activities under a special permit. Administered by the USFWS, the Act implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union (now Russia) for the protection of more than 800 species of migratory birds. Coordination with the USFWS may be necessary if a proposed project has the potential to affect migratory birds.

For additional information on the Migratory Bird Treaty Act, see the:

- Migratory Bird Treaty Act: <http://www.fws.gov/laws/lawsdigest/migtrea.html>
- USFWS Migratory Bird Program: <http://www.fws.gov/migratorybirds/>
- Migratory Bird List: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BirdManagement.html>
- Link to IPaC database: <http://ecos.fws.gov/ipac/>

### **B.2.7. Executive Order 13112, *Invasive Species***

As defined by Executive Order 13112, *Invasive Species*, 64 *Federal Register* 6183, (February 8, 1999), invasive species are non-native species whose introduction does or is likely to cause economic or environmental harm or harm to human health. A species is regarded as invasive if it:

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<sup>8</sup> Under the Migratory Bird Treaty Act, *taking* is defined as “pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting.”

1. Has been introduced by human action to a location where it did not previously occur naturally;
2. Becomes capable of establishing a breeding population in the new location without further intervention by humans; and
3. Spreads throughout the new location.

Pursuant to this Executive Order, Federal agencies whose actions may affect the status of invasive species are directed to use relevant programs and authorities, to the extent practicable and subject to available resources, to prevent the introduction of invasive species, and to provide for the restoration of native species and habitat conditions in ecosystems that have been invaded. Agencies are directed not to carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species unless the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures, and mitigation to minimize risk of harm are taken.

For additional information

- Link to Executive Order 13112: <http://www.gpo.gov/fdsys/pkg/FR-1999-02-08/pdf/99-3184.pdf>
- Link to the National Invasive Species Council website: <http://www.invasivespecies.gov/>

### **B.2.8. Executive Order 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds***

Executive Order 13186, *Responsibilities of Federal Agencies To Protect Migratory Birds*, 66 *Federal Register* 3853, (January 17, 2001) directs Federal agencies to take action to further implement the Migratory Bird Treaty Act for Federal actions that have, or are likely to have, a measurable negative effect on migratory bird populations, through the development and implementation of Memorandums of Understanding (MOUs) with the USFWS. In accordance with this Executive Order, the FAA signed a Memorandum of Agreement (MOA)<sup>9</sup> with the USFWS and other Federal agencies in December 2002 to address aircraft-wildlife strikes. Through this MOA, the agencies established procedures to coordinate their missions to more effectively mitigate against existing and future environmental conditions that contribute to wildlife strikes with aircraft.

For additional information on this Executive Order, see <http://www.gpo.gov/fdsys/pkg/FR-2001-01-17/pdf/01-1387.pdf>

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<sup>9</sup> MOA Between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes. Available at: [http://www.faa.gov/airports/environmental/media/wildlife\\_hazard\\_mou\\_2003.pdf](http://www.faa.gov/airports/environmental/media/wildlife_hazard_mou_2003.pdf).

### **B.2.9. CEQ Guidance, *Incorporating Biodiversity Considerations Into Environmental Impact Analysis Under the National Environmental Policy Act***

In accordance with 40 CFR §§ 1507.2(e), 1508.8(b), and 1508.27, this guidance directs Federal agencies to consider the effects of Federal actions on biodiversity to the extent that is possible to both anticipate and evaluate those effects. The guidance outlines the general principles and discusses the importance of context – that is, examining the direct, indirect, and cumulative impacts of a specific project in the regional or ecosystem context.

For additional information see the CEQ Guidance at [http://energy.gov/sites/prod/files/nepapub/nepa\\_documents/RedDont/G-CEQ-BiodiversityConsiderations.pdf](http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-CEQ-BiodiversityConsiderations.pdf)

### **B.2.10. Memorandum of Understanding to Foster the Ecosystem Approach (December 1995)**

This MOU was signed between Council on Environmental Quality (CEQ) and all Federal Departments, EPA, and the Office of Science Technology Policy. The MOU emphasizes consideration of all relevant and identifiable ecological and economic consequences both long term and short term; coordination among Federal agencies; partnership; communication with the public; efficient and cost-effective implementation; use of best available science; improved data and information management, and responsiveness to changing circumstances. The MOU can be found at <http://environment.fhwa.dot.gov/guidebook/vol1/doc17b.pdf>

## **B.3. Climate**

### **B.3.1. Clean Air Act**

The CAA is the comprehensive Federal law that regulates the emission of air pollutants from stationary and mobile sources. Among other things, the CAA authorizes the U.S. EPA to establish NAAQS for common air pollutants (known as “criteria pollutants”) to protect public health and welfare, and to regulate emissions of hazardous HAPs. More information on the CAA is available at <http://www2.epa.gov/laws-regulations/summary-clean-air-act>

### **B.3.2. Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance**

The Executive Order makes it the policy of the United States that Federal agencies measure, report, and reduce their Greenhouse Gas (GHG) emissions from direct and indirect activities. Provides for development of the Technical Support Document that establishes reporting criteria for GHGs. The Executive Order is available at [https://www.whitehouse.gov/assets/documents/2009fedleader\\_eo\\_rel.pdf](https://www.whitehouse.gov/assets/documents/2009fedleader_eo_rel.pdf)

The following statutes and Executive Orders govern the protection of coastal resources.



### **B.3.3. Coastal Barrier Resources Act**

The Coastal Barrier Resources Act (CBRA) encourages the conservation of hurricane prone, biologically-rich coastal barriers by restricting Federal financial assistance (including disaster relief assistance provided by the Federal Emergency Management Agency (FEMA)) for development of these ecosystems. Administered by the USFWS, the CBRA established the Coastal Barrier Resources System (CBRS), a designation of relatively undeveloped coastal barriers that serve as barriers protecting the Atlantic, Gulf, and Great Lakes coasts. The CBRS currently includes 585 units, comprising nearly 1.3 million acres of land and associated aquatic habitat.

Section 6 of the CBRA provides exemptions for Federal agencies to fund certain projects within the CBRS. Under these exemptions, the FAA may provide financial support to set up, operate, or maintain navigational aids and devices that are part of the nation's air navigation system in CBRS units. Compliance with the CBRA may require consultation with the USFWS. This Act does not address Federal actions that do not involve expenditures, such as the issuance of Federal permits, licenses, or other authorizations. Areas within the CBRS can be developed provided the applicant bears the full cost. However, the FAA encourages applicants to meet the requirements of the Act.

For additional information on the CBRA, see the USFWS's website at: <http://www.fws.gov/CBRA/> or the DOI Coastal Barrier Act Advisory Guidelines at 57 *Federal Register* 52730, (November 5, 1992).

### **B.3.4. Coastal Zone Management Act**

The Coastal Zone Management Act (CZMA) is a Federal law which provides for management of the nation's coastal resources, including the Great Lakes. Administered by the National Oceanic and Atmospheric Administration's (NOAA's) Office of Ocean and Coastal Resource Management (OCRM), the CZMA was created to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone.

One of the programs outlined by the CZMA is the National Coastal Zone Management Program, which is a voluntary partnership among the Federal government and coastal and Great Lakes states and territories. Under this program, state governments design unique coastal zone management programs which are subsequently approved by NOAA. Once these programs have been approved, the CZMA requires that any Federal actions that could have a reasonably foreseeable impact on a state's coastal zone (even if the action occurs outside the designated coastal zone) be consistent with the approved coastal management program for that state. Fulfilling the FAA's obligations under the CZMA may require conducting consultation with the affected state's coastal management program office.

For additional information on the CZMA, including links to NOAA's CZMA regulations, see NOAA's website at: <http://coast.noaa.gov/>.

### **B.3.5. National Marine Sanctuaries Act**

The National Marine Sanctuaries Act authorizes the Secretary of Commerce to designate and protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational,

or aesthetic qualities as national marine sanctuaries. The primary objective of this Act is to protect marine resources, such as coral reefs, sunken historical vessels, or unique habitats. The Act provides the authority to issue regulations for sanctuaries, requires preparation of management plans, authorizes NOAA to assess civil penalties, and requires Federal agencies whose actions could impact sanctuary resources to consult with the program before taking action.

For additional information on the National Marine Sanctuaries Act, see NOAA's website at: <http://sanctuaries.noaa.gov/about/legislation/>.

### **B.3.6. Executive Order 13089, *Coral Reef Protection***

Executive Order 13089, *Coral Reef Protection*, 63 *Federal Register* 32701, (June 16, 1998) requires Federal agencies to identify any actions that might affect coral reef ecosystems, protect and enhance the conditions of these ecosystems, and ensure that, to the extent permitted by law, the actions carried out, authorized, or funded by Federal agencies will not negatively impact or degrade coral reef ecosystems. Under this Executive Order, U.S. coral reef ecosystems are defined to mean those species, habitats, and other natural resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States.

For additional information on

- The Executive Order, see [http://www.coralreef.gov/about/executive\\_order13089.pdf](http://www.coralreef.gov/about/executive_order13089.pdf).
- NOAA's Coral Reef Conservation Program see <http://coralreef.noaa.gov/>
- Coral Reefs in General see EPA's Coral website at [http://water.epa.gov/type/oceb/habitat/coral\\_index.cfm](http://water.epa.gov/type/oceb/habitat/coral_index.cfm)

### **B.3.7. Executive Order 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes***

Executive Order 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes*, 75 *Federal Register* 43023, (July 22, 2010) ensures that the ocean, our coasts, and the Great Lakes are healthy and resilient, safe and productive, and understood and treasured, so as to promote the well-being, prosperity, and security of present and future generations. This Executive Order establishes the National Policy for the Stewardship of the Ocean and provides that Federal agencies will ensure the protection, maintenance, and restoration of the health of ocean, coastal, and Great Lakes ecosystems and resources, enhance the sustainability of ocean and coastal economies, preserve our maritime heritage, support sustainable uses and access, provide for adaptive management to enhance our understanding of and capacity to respond to climate change and ocean acidification, and coordinate with our national security and foreign policy interests. In addition, this Executive Order establishes the National Ocean Council, and directs the Council to develop a National Ocean Policy Implementation Plan. Agencies are directed to comply with the Council's recommendations, and use the best available science and knowledge to inform decisions affecting the ocean, our coasts, and the Great Lakes.

For additional information on this Executive Order, see <http://www.gpo.gov/fdsys/pkg/FR-2010-07-22/pdf/2010-18169.pdf>

## **B.4. Farmlands**

The following statute governs the protection of farmlands.

### **B.4.1. Farmland Protection Policy Act**

The Farmland Protection Policy Act, administered by the Natural Resource Conservation Service (NRCS), regulates Federal actions with the potential to convert farmland to non-agricultural uses. This Act is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to non-agricultural uses. It ensures that, to the extent possible, Federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmlands. Please note that any acquisition or use of farmland by a Federal agency for the purposes of national defense is considered exempt under the Farmland Protection Policy Act.

This Act requires Federal agencies to use NRCS-established criteria to identify and take into account the potential adverse effects of their programs on the preservation of farmland, to consider alternative actions and mitigation, as appropriate, that could lessen adverse effects, and to ensure that their programs, to the extent practicable, are compatible with state and local government and private programs and policies to protect farmland. Federal agencies assess these impacts through completion of Form AD-1006, the *Farmland Conversion Impact Rating* form.

For additional information on NRCS-established criteria, see NRCS Regulations at: [http://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/stelprdb1042433.pdf](http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1042433.pdf).

## **B.5. Hazardous Materials, Solid Waste, and Pollution Prevention**

The following statutes, Executive Orders, memorandum, and FAA orders and advisory circulars govern hazardous materials, solid waste, and pollution prevention.

### **B.5.1. Comprehensive Environmental Response, Compensation, and Liability Act**

Enacted in 1980, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was created to provide Federal authority to respond to releases of hazardous substances which may be harmful to public health or the environment. It established liability for those parties responsible for hazardous substance releases to pay cleanup costs and established a trust fund to finance cleanup costs in situations in which no responsible party could be identified. In addition, CERCLA enabled the creation of the National Priorities List (NPL), a list of sites with known releases or threatened releases of hazardous substances in the United States and its territories, used to guide the EPA in determining which sites warrant further investigation.

Some important aspects of CERCLA that are applicable to Federal actions include:

- Notifying the EPA and the public regarding release of hazardous substances that exceed reportable quantities. Under CERCLA, the EPA has established a list of those elements, compounds, mixtures, solutions, or substances considered a *hazardous substance* within the meaning of CERCLA. These substances are listed in 40 CFR § 302.4;
- Requiring all Federal agencies to comply with CERCLA regulations at all Federally-owned facilities; and

- Establishing an “innocent landowners” defense to CERCLA liability if the party acquiring the property conducted all appropriate inquiries prior to acquisition of the property.

For a general overview of CERCLA, see <http://www.epa.gov/superfund/policy/cercla.htm>. NPL site information may be accessed via EPA’s Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database, which is available at: <http://www.epa.gov/superfund/sites/cursites/>.<sup>10</sup>

### **B.5.2. Oil Pollution Act**

The Oil Pollution Act of 1990 streamlined and strengthened the EPA’s ability to prevent and respond to catastrophic oil spills. A trust fund financed by a tax on oil is available to clean up spills when the responsible party is incapable or unwilling to do so. The Act requires oil storage facilities and vessels to submit to the Federal government plans detailing how they will respond to large discharges. The EPA has published regulations for aboveground storage facilities (see 40 CFR parts 9-300); the U.S. Coast Guard (USCG) has done so for oil tankers. The Act also requires the development of Area Contingency Plans to prepare and plan for oil spill response on a regional scale. The Act applies to facilities storing: (1) at least 1,320 gallons in aboveground containers that are 55 gallons in size or larger; or (2) at least 42,000 gallons in underground storage tanks.

For more information on the Oil Pollution Act, see the EPA website at: <http://www2.epa.gov/laws-regulations/summary-oil-pollution-act>.

### **B.5.3. Pollution Prevention Act**

The Pollution Prevention Act of 1990 requires pollution prevention and source reduction control so that wastes will have less effect on the environment while in use and after disposal. The intent of this Act should also be considered when reviewing potential sources associated with a proposed project and related pollution prevention measures.

For more information on the Pollution Prevention Act, see the EPA website at: <http://www2.epa.gov/laws-regulations/summary-pollution-prevention-act>.

### **B.5.4. Resource Conservation and Recovery Act**

The Resource Conservation and Recovery Act (RCRA) is a Federal statute that establishes guidelines for hazardous waste and non-hazardous solid waste management activities in the United States (40 CFR 240-299). Specifically, RCRA regulates the generation, storage, treatment, and disposal of waste. Administered by the EPA, the goals of RCRA are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner.

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<sup>10</sup> In 2014, the Superfund Program implemented a new information system, the Superfund Enterprise Management System (SEMS). Efforts to migrate data to SEMS and to enhance data quality control are progressing. The Program will continue to rely on the final CERCLIS data set (dated November 12, 2013, which reflects official end of Fiscal Year 2013 Program progress) for public reporting until a complete and accurate SEMS data set is available. The current estimate for refreshing the content on this page is December 31, 2014.

To achieve these goals, RCRA establishes three separate programs that govern hazardous and non-hazardous wastes:

**Hazardous wastes.** Subtitle C of RCRA establishes guidelines for the generation, treatment, storage, and disposal (TSD) of hazardous wastes.

**Non-hazardous wastes.** Subtitle D of RCRA creates a regulatory program for non-hazardous solid waste, such as household garbage, refuse (including construction material), and non-hazardous industrial solid waste.

**Underground storage tanks.** Subtitle I of RCRA governs the storage of materials in underground storage tanks, including storage of both unused products (including gasoline) and wastes.

Of these programs, the hazardous wastes and non-hazardous waste programs most relevant to FAA actions are described in more detail below.

#### **B.5.4.1. Hazardous Waste Management**

The NEPA review should demonstrate that the FAA or applicant, as appropriate, has determined whether hazardous wastes (as defined in 40 CFR part 261) will be disturbed, generated, transported, treated, stored, or disposed of by the action under consideration, and if so, how these wastes will be handled to conform to the regulatory requirements in 40 CFR parts 260-280 and transported to conform to 49 CFR parts 171-199. Therefore, the NEPA document should identify the types and approximate amounts of hazardous waste that will be generated, and identify appropriate disposal facilities.

The EPA's current list of identified hazardous wastes is available on the EPA's Wastes website at: <http://www.epa.gov/osw/hazard/wastetypes/listed.htm>.

#### **B.5.4.2. Non-hazardous Waste Management**

In addition to hazardous wastes, RCRA also sets forth a framework for the management of non-hazardous solid wastes that are exempt from Subtitle C regulations. In contrast to the hazardous waste program, RCRA does not authorize the EPA to issue Federal permits for disposal of non-hazardous solid wastes; rather, all planning, permitting, and enforcement responsibilities for these types of wastes is ultimately delegated to state and local governments.

For additional information on RCRA, and how it may be applicable to the proposed action or alternative(s), see the EPA's Wastes website at: <http://www.epa.gov/epawaste/laws-regs/index.htm> or consult EPA's RCRA Online website at: <http://www.epa.gov/epawaste/inforesources/online/index.htm>.

#### **B.5.5. Toxic Substances Control Act**

The Toxic Substances Control Act (TSCA) provides the EPA with the authority to regulate the production, importation, use, and disposal of chemicals defined as toxic, including lead, radon, asbestos, and polychlorinated biphenyls (PCBs), that have the potential to cause unreasonable risk of injury to public health or the environment. Through this Act, the EPA has established reporting, testing, and distribution requirements for the chemicals listed in the TSCA Inventory, which include substances such as asbestos, indoor radon, lead, and PCBs.

For more information on TSCA, see: <http://www.epa.gov/agriculture/lsc.html>.

### **B.5.6. Executive Order 12088, *Federal Compliance with Pollution Control Standards***

Executive Order 12088, *Federal Compliance With Pollution Control Standards*, 43 *Federal Register* 47707, (October 17, 1978) directs Federal agencies to comply with applicable pollution control standards, in the prevention, control, and abatement of environmental pollution and to consult with the EPA, state, interstate, and local agencies concerning the best techniques and methods available for the prevention, control, and abatement of environmental pollution. In addition, this Executive Order directs Federal agencies to ensure that construction or operation of Federal facilities outside the United States complies with the environmental pollution control standards of general applicability in the host country or jurisdiction. The NEPA document should identify how the FAA is complying with the applicable pollution control standards.

For more information on this Executive Order, see: [http://energy.gov/sites/prod/files/nepapub/nepa\\_documents/RedDont/Req-EO12088pollutioncontrol.pdf](http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/Req-EO12088pollutioncontrol.pdf).

The former requirements of Section 1-4 of E.O. 12088 regarding pollution control plans were revoked by section 901 of Executive Order 13148, [Greening the Government Through Leadership in Environmental Management](#) (April 21, 2000).

### **B.5.7. Executive Order 12580, *Superfund Implementation***

Executive Order 12580, *Superfund Implementation*, 52 *Federal Register* 2923, (January 29, 1987) addresses various Federal agency activities in implementing the statutory provisions and regulations of CERCLA. The Executive Order creates a National Response Team made up of various Federal agencies and departments for national planning and coordination of preparedness and response actions, and also creates regional response teams. The Executive Order also contains a very detailed delegation of various Presidential responsibilities imposed under CERCLA to various officials in Federal department agencies. Among the types of authorities delegated are those for response action oversight, enforcement, liability determinations, litigation, and Superfund management. The Executive Order applies to or affects responses to major oil or hazardous substance spills or releases that occur on- or off-site and impact the facility.

For more information on this Executive Order, see: <http://www.archives.gov/Federal-register/codification/executive-order/12580.html>.

Also see Executive Order 13016, *Amendment to Executive Order No. 12580*, August 30, 1996 (61 *Federal Register* 45871) available at <http://www.gpo.gov/fdsys/pkg/FR-1996-08-30/pdf/96-22462.pdf> and Executive Order 13308, *Further Amendment to Executive Order 12580*, as Amended, June 20, 2003 (68 *Federal Register* 37691) available at <http://www.gpo.gov/fdsys/pkg/FR-2003-06-24/pdf/03-16102.pdf>.

**B.5.8. Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance***

Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 *Federal Register* 52117, (October 8, 2009) requires all Federal agencies to make sustainability a priority in agency operations, and covers all aspects of agency operations from the construction or renovation of agency facilities to the conduct of daily business. The reduction of greenhouse gases (GHGs) from Federal activities is one of the primary focuses of the Executive Order. Other sustainability considerations include reduced environmental impact from materials used in agency operations and eliminating waste, recycling, and preventing pollution. The Executive Order calls for specific management strategies to improve sustainability including, among others, minimizing the acquisition, use, and disposal of toxic and hazardous materials. It sets a target of achieving a 50 percent or higher diversion rate for non-hazardous solid waste, and construction and demolition materials and debris by fiscal year (FY) 2015.

For more information on this Executive Order, see: <http://www.gpo.gov/fdsys/pkg/FR-2009-10-08/pdf/E9-24518.pdf>.

**B.5.9. Council on Environmental Quality Memorandum on *Pollution Prevention and the National Environmental Policy Act***

The CEQ Memorandum on *Pollution Prevention and the National Environmental Policy Act* (January 12, 1993) encourages early consideration by Federal agencies (for example, during the NEPA scoping process) of opportunities for pollution prevention. In accordance with this guidance, the FAA should, to the extent practicable, include pollution prevention considerations in the proposed action and its alternative(s); address pollution prevention in the environmental consequences section; and disclose in the Record of Decision (ROD) the extent to which pollution prevention was considered.

The memorandum can be accessed from CEQ's website at: [https://ceq.doe.gov/nepa/regs/Pollution\\_Prevention\\_Guidance\\_Jan\\_1993.pdf](https://ceq.doe.gov/nepa/regs/Pollution_Prevention_Guidance_Jan_1993.pdf)

**FAA Orders and Advisory Circulars**

There are several FAA orders to review for guidance on the design, construction, and operational compliance of FAA facilities with pollution control statutes depending on the nature of the proposed action or alternative(s). These include the following:

- FAA Order 1050.10C, *Prevention, Control and Abatement of Environmental Pollution at FAA Facilities* at: [http://www.faa.gov/documentLibrary/media/Order/ND/1050\\_10c.pdf](http://www.faa.gov/documentLibrary/media/Order/ND/1050_10c.pdf);
- FAA Order 1050.14B, *Polychlorinated Biphenyls (PCB) in the National Airspace System* at: <http://www.faa.gov/documentLibrary/media/Order/order%201050.14B.pdf>;
- FAA Order 1050.15A, *Fuel Storage Tanks at FAA Facilities* at: [http://www.faa.gov/documentLibrary/media/order/energy\\_orders/1050.15A.pdf](http://www.faa.gov/documentLibrary/media/order/energy_orders/1050.15A.pdf);
- FAA Order 1050.16, *Implementation Guidelines for Compliance With Underground Storage Tanks (UST)* at:

[http://www.faa.gov/regulations\\_policies/orders\\_notices/index.cfm/go/document.information/documentID/6407](http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/6407);

- FAA Order 1050.18, *Chlorofluorocarbons and Halon Use at FAA Facilities* at: [http://www.faa.gov/documentLibrary/media/order/energy\\_orders/1050.18.pdf](http://www.faa.gov/documentLibrary/media/order/energy_orders/1050.18.pdf).

The full text of these orders can be accessed through the FAA document library on the FAA's website.

Additionally, there are two FAA advisory circulars that may provide further guidance:

- FAA AC 150/5320-15A, *Management of Airport Industrial Waste* at: [http://www.faa.gov/documentLibrary/media/advisory\\_circular/150-5320-15A/150\\_5320\\_15a.pdf](http://www.faa.gov/documentLibrary/media/advisory_circular/150-5320-15A/150_5320_15a.pdf); and
- FAA AC 140.5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, at: [http://www.faa.gov/documentLibrary/media/advisory\\_circular/150-5200-33B/150\\_5200\\_33b.pdf](http://www.faa.gov/documentLibrary/media/advisory_circular/150-5200-33B/150_5200_33b.pdf).

## **B.6. Historical, Architectural, Archeological, and Cultural Resources**

The following statutes and Executive Orders govern the protection of historical, architectural, archeological, and cultural resources.

### **B.6.1. American Indian Religious Freedom Act**

The American Indian Religious Freedom Act requires consultation with Native American groups concerning actions on sacred sites or affecting access to sacred sites. It establishes Federal policy to protect and preserve the right to free exercise of religion for American Indians, Eskimos, Aleuts, and Native Hawaiians. It allows these people to access sites, use and possess sacred objects, and freedom to worship through ceremonial and traditional rites. In practical terms, the Act requires Federal agencies to consider the impacts of their actions on religious sites and objects that are important to Native Americans, including Alaska Natives and Native Hawaiians, regardless of the eligibility for the National Register of Historic Places (NRHP). For more information on the American Indian Religious Freedom Act, see [http://www.cr.nps.gov/local-law/fhpl\\_IndianRelFreAct.pdf](http://www.cr.nps.gov/local-law/fhpl_IndianRelFreAct.pdf).

### **B.6.2. Historic Sites Act**

The Historic Sites Act declares as national policy the preservation for public use of historic sites, buildings, objects, and properties of national significance. It gives the Secretary of the Interior authority to make historic surveys, to secure and preserve data on historic sites, and to acquire and preserve archeological and historic sites. The Act also establishes the National Historic Landmarks program for designating properties having exceptional value in commemorating or illustrating the history of the United States. It gives the Secretary of the Interior broad powers to protect nationally significant historic properties, including the Secretary's authority to establish and acquire nationally significant historic sites. For more information on the Historic Sites Act, see [http://www.cr.nps.gov/local-law/FHPL\\_HistSites.pdf](http://www.cr.nps.gov/local-law/FHPL_HistSites.pdf).



### **B.6.3. National Historic Preservation Act**

The National Historic Preservation Act (NHPA) establishes an independent agency, the Advisory Council on Historic Preservation (ACHP). It also establishes the NRHP within the National Park Service (NPS). Section 106 of NHPA requires Federal agencies to consider the effects of their undertaking (or action) and consult with specific parties on properties listed on or eligible for listing on the NRHP. “Eligible” for listing in the NRHP includes all properties that meet the specifications laid out in the DOI regulations at 36 CFR § 60.4.

Section 110 of the NHPA governs Federal agencies’ responsibilities to preserve and use historic buildings; designate an agency Federal Preservation Officer; and identify, evaluate, and nominate eligible properties under the control or jurisdiction of the agency to the NRHP.

Section 112 of the NHPA addresses professional standards. Section 314 discusses confidentiality requirements that may apply to an undertaking. Section 402 discusses Federal actions outside the United States that may adversely affect a property which is on the World Heritage List or on the applicable country’s equivalent of the NRHP. For more information on the NHPA, see the ACHP’s website at: <http://www.achp.gov/nhpa.html>.

### **B.6.4. Native American Graves Protection and Repatriation Act**

The Native American Graves Protection and Repatriation Act (NAGPRA) deals with the disposition of cultural items, including human remains, by a Federally-funded repository. Additionally, the NAGPRA governs the inadvertent discovery of cultural items on Federal or tribal lands. It provides for the inventory, protection, and return of cultural items to affiliated tribes. NAGPRA requires Archaeological Resources Protection Act permits, as well as consultation with tribes, for intentional excavation and removal of cultural items from Federal or tribal lands. Its regulations include provisions that, upon inadvertent discovery, the Federal agency will cease all activity in the area of discovery, protect the discovered items, and immediately notify the affected tribe. Disposition of the items must then be carried out in accordance with NAGPRA procedures. For more information on NAGPRA, see the NPS’ website at: <http://www.nps.gov/archeology/tools/Laws/NAGPRA.htm>.

### **B.6.5. Executive Order 13007, *Indian Sacred Sites*; Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*; and Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments**

Executive Order 13007, *Indian Sacred Sites*, 61 *Federal Register* 26771, (May 29, 1996) applies to Federal agencies that manage Federal lands, defined as “any land or interests in land owned by the United States, including leasehold interests held by the United States, except Indian trust lands.” Agencies, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, must: (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners; and (2) avoid adversely affecting the physical integrity of such sacred sites. Agencies shall maintain the confidentiality of sacred sites by virtue of their established religious significance to, or ceremonial use by, an Indian religion, provided the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site. Executive Order 13007 requires Federal agencies to consult on a government-to-government basis with tribes if the proposed project involves an

Indian Sacred Site. This provides meaningful and timely input in development of regulatory policies on matters that significantly or uniquely affect their communities. Additional information may be obtained from the FAA Federal Preservation Officer. For more information on Executive Order 13007, see <http://www.gpo.gov/fdsys/pkg/FR-1996-05-29/pdf/96-13597.pdf>. For more information on Executive Order 13175, see <http://www.gpo.gov/fdsys/pkg/FR-2000-11-09/pdf/00-29003.pdf>. For more information on the Presidential Memorandum, see <http://www.gpo.gov/fdsys/pkg/WCPD-1994-05-02/pdf/WCPD-1994-05-02-Pg936.pdf>.

## B.7. Natural Resources and Energy Supply

The following statute and Executive Order govern the protection of natural resources and energy supply.

As stated in the Energy Independence and Security Act (EISA) and Executive Order 13423 *Strengthening Federal Environmental, Energy, and Transportation Management*, 72 Federal Register 3919, (January 26, 2007) the FAA must reduce building energy intensity<sup>11</sup> in goal subject buildings by 30 percent by the end of FY 2015 relative to the FY 2003 baseline (see Section 2(a)(ii) of Executive Order 13423 and Section 431 of EISA (42 U.S.C. § 8253(a)(1))). The FAA must reduce potable water intensity<sup>12</sup> 2 percent annually or 26 percent by the end of FY 2020 relative to a FY 2007 baseline (see Section 2(d)(i) of Executive Order 13514). The FAA must also seek to identify, promote, and implement water reuse strategies that reduce potable water consumption. The FAA must reduce consumption of industrial, landscaping, and agricultural water by 2 percent annually or 20 percent by the end of FY 2020 relative to a FY 2010 baseline (see Section 2(d)(ii) of Executive Order 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 Federal Register 52117, (October 8, 2009)).

If an action involves large capital energy or water investment in an existing building that is not a major renovation but involves replacement of installed equipment (such as heating and cooling systems), or involves renovation, rehabilitation, expansion, or remodeling of existing space, the FAA must employ the most energy and water efficient designs, systems, equipment, and controls that are life cycle cost-effective (see Section 434(a) of EISA (42 U.S.C. § 8253)).

If the proposed action involves the new construction or major renovation of an FAA-owned building or built to suit lease, the following requirements must be met. It is the responsibility of the LOB/SO that is planning, designing, and constructing the building to ensure implementation of these requirements. These requirements must be incorporated into standard design criteria, statements of work, and construction documents.

1. All new FAA construction and major renovation projects must be completed in accordance with the Federal building design standards most recently published by the U.S. Department of Energy (DOE) (see 10 CFR part 433).

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<sup>11</sup> **Energy Intensity** refers to the amount of energy, in British Thermal Units (BTUs), consumed per gross square foot of a facility.

<sup>12</sup> **Potable Water Intensity** refers to the amount of potable water, in gallons, consumed per gross square foot of a facility.

2. New and replacement FAA buildings must be designed to achieve energy consumption levels that are at least 30 percent below the levels established in ASHRAE 90.1 standard or International Energy Code, if life cycle cost-effective (see Section 109(2)(i) of the Energy Policy Act (EPAct) (42 U.S.C. § 6834(a))).
3. New construction and major renovation projects must be designed so that the fossil fuel-generated energy consumption of the buildings is reduced, as compared with such energy consumption by a similar building in FY 2003 (as measured by Commercial Buildings Energy Consumption Survey or Residential Energy Consumption Survey data from the Energy Information Agency), by the percentage specified in the following bullets (see Section 433(a)(D)(i) of EISA (42 U.S.C. § 6834 (a)(3))):
  - 55% reduction for building beginning design in FY 2010;
  - 65% reduction for building beginning design in FY 2015;
  - 80% reduction for building beginning design in FY 2020;
  - 90% reduction for building beginning design in FY 2025; and
  - 100% reduction for building beginning design in FY 2030.
4. All new FAA buildings that enter the planning process in FY 2020 and thereafter must be designed to achieve zero-net-energy by FY 2030. A zero-net-energy building requires a greatly reduced quantity of energy to operate and meets the balance of energy needs from energy sources that do not produce GHGs, therefore resulting in no net emissions of GHGs, and is economically viable (see Section 2(g)(i) of Executive Order 13514).
5. The FAA must ensure that new construction and major renovations of buildings comply with the *Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings (Guiding Principles)* (see Section 2(g)(ii) of Executive Order 13514). The *Guiding Principles* require new construction and major renovations to:
  - Employ Integrated Design Principles;
  - Optimize Energy Performance;
  - Protect and Conserve Water;
  - Enhance Indoor Environmental Quality; and
  - Reduce Environmental Impact of Materials.
6. The FAA must meet 30 percent of hot water demand in new construction and major renovations through installation and use of solar hot water heaters, where life cycle cost-effective (see Section 523(3) of EISA (42 U.S.C. § 6834(a)(3)(A))).
7. All new construction and major renovation projects at FAA facilities must include installation of advanced meters for electricity (see Section 103(e)(1) of EPAct (42 U.S.C. § 8253), and gas and steam advanced meters (see Section 434(b) of EISA (42 U.S.C. § 8253(e)(1))), where practical and cost-effective. All meters must be installed at the building or sub metering level in accordance with current DOE Federal Energy Management Program metering best practices.
8. The FAA must, in a manner that is consistent with state law, identify, promote, and implement water reuse strategies that reduce potable water consumption (see Section 2(d)(iii) of Executive Order 13514).
9. The FAA must implement renewable energy generation projects on FAA property for FAA use, to the extent feasible (see Section 2(b)(ii) of Executive Order 13423 and Section 2(ii) of

Executive Order 13514). The FAA should give preference to renewable energy investments that enhance or improve the operation of the National Airspace System, for example, by improving reliability. Proposed actions should evaluate implementation of on-site renewable energy generation.

10. Any proposed action involving the development or redevelopment of an FAA facility with a footprint that exceeds 5,000 square feet must use site planning, design, construction, and maintenance strategies to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow (see Section 438 of EISA (42 U.S.C. § 17094)). The FAA must implement and achieve the objectives in the EPA's Stormwater Guidance, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* (see Section 2(d)(iv) of Executive Order 13514). As defined within EPA's guidance, the term "footprint" includes all land areas that are disturbed as part of a project.

For any proposed action involving the direct leasing of space, the lease must have received the ENERGY STAR® designation in the most recent year, if financially feasible (see Section 435(a) of EISA (42 U.S.C. § 17091)). The acquisition is considered financially feasible if the proposed rental is not more than 10 percent over the market rate for a comparable building in the same rental market. If one of the conditions described below is met, the FAA may enter into a contract to lease space in a building that has not earned the ENERGY STAR® label in the most recent year. However, the lease contract must include provisions requiring that, prior to occupancy, building owners must implement lease-duration cost-effective efficiency and conservation improvements. In the case of remaining in a current building, the owner must implement improvements not later than one year after signing the contract. This includes improvements in lighting, building envelope, and HVAC systems. The Real Estate Contracting Officer (RECO) can make an exception when:

1. ENERGY STAR® rated space is not available that meets the FAA's functional requirements;
2. The FAA proposes to remain in a building that the agency has occupied previously;
3. The FAA proposes to lease a building of historical, architectural, or cultural significance (as defined in 40 U.S.C. § 3306(a)(4)) or space in such a building; or
4. The lease is for less than 10,000 gross square feet of space (see Section 435(b)(1)(D) of EISA (42 U.S.C. § 17091)).

For any proposed action involving a direct lease greater than 5,000 gross square feet, compliance with the *Guiding Principles* must be evaluated. The FAA must implement sustainable practices for the lease, operation, and maintenance of buildings (see Section 3(a)(vii) of Executive Order 13423). The FAA must ensure that at least 15 percent of existing owned and FAA leased buildings, greater than 5,000 gross square feet, meet the *Guiding Principles* by FY 2015 and make annual progress toward 100-percent conformance (see Section 2(g)(iii) of Executive Order 13514). A RECO may pay a premium for sustainable leased spaces to the extent that funds are available. The space acquisition will be considered financially feasible if:

1. The rental offer for space in a conforming building is no more than 10 percent greater than the market rate for a comparable conventional building in the same rental market.

2. If the market does not support buildings that meet the *Guiding Principles*, then the RECO must provide written justification in the Negotiator Report.

## **B.8. Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks**

The following statutes, orders, regulations, and other documents govern socioeconomics and environmental justice.

### **B.8.1. Socioeconomics**

#### **B.8.1.1. Council on Environmental Quality Regulations for Implementing NEPA**

The CEQ Regulations require analysis of socioeconomic impacts by stating that “*effects*” to be considered when preparing a NEPA document include “ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative” (see 40 CFR § 1508.8) and that through NEPA, the *Human Environment* “shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment” (see 40 CFR § 1508.14). The CEQ Regulations also state that although “economic or social effects are not intended by themselves to require preparation of an environmental impact statement” when “economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment.” The CEQ Regulations use the terms “effects” and “impacts” synonymously.

#### **B.8.1.2. Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970**

If acquisition of real property or displacement of people would occur as a result of the proposed action or alternative(s), follow the provisions in 49 CFR part 24 (which implements the Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970), which state the following:

- a. Ensure that owners of real property to be acquired for Federal and Federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owners, to minimize litigation and relieve congestion in the courts, and to promote public confidence in Federal and Federally-assisted land acquisition programs;
- b. Ensure that persons displaced as a direct result of Federal or Federally-assisted projects are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole; and
- c. Ensure that Agencies implement these regulations in a manner that is efficient and cost effective.

To view the full text of the regulation posted on the FHWA’s website, see <http://www.fhwa.dot.gov/legsregs/directives/fapg/cfr4924a.htm>.

If the proposed action or alternative(s) does not specifically require acquisition of property or displacement of people, the FAA, to the fullest extent possible, should observe all state and local

laws, regulations, and ordinances concerning zoning, transportation, economic development, and housing when planning, assessing, or implementing a proposed action or alternative(s).

## **B.8.2. Environmental Justice**

### **B.8.2.1. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations***

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, 59 *Federal Register* 7629, (February 16, 1994) requires Federal agencies to incorporate environmental justice into their planning processes by identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The Executive Order encourages Federal agencies to provide public involvement opportunities for low-income or minority populations. This includes demographic analysis identifying and addressing impacts from the proposed action and alternative(s) on low-income or minority populations that may experience a disproportionately high and adverse effect. The Executive Order encourages each Federal agency, whenever practicable and appropriate, to collect, maintain, and analyze information assessing and comparing environmental and human health risks posed to populations identified by race, national origin, or income and use this data to identify multiple and cumulative exposures on these at-risk populations.

To read the full text of this Executive Order, see [http://energy.gov/sites/prod/files/EJ\\_MOU\\_201108.pdf](http://energy.gov/sites/prod/files/EJ_MOU_201108.pdf)

### **B.8.2.2. Department of Transportation Order 5610.2, Environmental Justice in Minority and Low-Income Populations**

This Order was issued to comply with Executive Order 12898. This Order outlines the DOT's commitment to the principles of environmental justice and presents a program for department-wide implementation. The Order established environmental justice policy "to actively administer and monitor its operations and decision making to ensure that nondiscrimination is an integral part of its programs, policies, and activities." The Order emphasizes identifying and evaluating environmental, public health, and interrelated social and economic effects; proposing measures to avoid, minimize, and/or mitigate disproportionately high and adverse effects; and eliciting public involvement from affected communities. The following two principles are presented for integrating environmental justice into current policies and practices:

1. Planning and programming activities that have the potential to have a disproportionately high and adverse effect on human health or the environment shall include explicit consideration of the effects on minority populations and low-income populations. Procedures shall be established or expanded, as necessary, to provide meaningful opportunities for public involvement by members of minority populations and low-income populations during the planning and development of programs, policies, and activities (including the identification of potential effects, alternatives, and mitigation measures).
2. Steps shall be taken to provide the public, including members of minority populations and low-income populations, access to public information concerning the human health or environmental impacts of programs, policies, and activities, including information that will

address the concerns of minority and low-income populations regarding the health and environmental impacts of the proposed action or alternative(s).

To read the full text of the Order, see the FHWA's website at: [http://www.fhwa.dot.gov/environment/environmental\\_justice/ej\\_at\\_dot/orders/order\\_56102a/dot56102a.pdf](http://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/orders/order_56102a/dot56102a.pdf).

### **B.8.2.3. CEQ Guidance – *Environmental Justice: Guidance Under the National Environmental Policy Act***

In addition to the regulatory requirements listed above, CEQ issued guidance suggesting how environmental justice could be considered in NEPA documents. The CEQ document, *Environmental Justice: Guidance Under the National Environmental Policy Act* (December 1997), offers several principles focusing on identifying minority and low-income communities, providing meaningful opportunities for public participation, and mitigating potential disproportionately high and adverse environmental and human health effects. Other areas of emphasis include addressing language barriers, seeking tribal representation, and considering environmental justice in specific phases of the NEPA process.

The guidance suggests that it is important to recognize that the cultural, historic, or social concerns of a low-income or minority population amplify that population's perceptions of an action's effects. Consequently, reaching out to local community leaders, tribal elders, or other suitable spokespeople early in the environmental process is often an important step in efficiently and effectively completing an environmental justice analysis. Often, that contact is the best way to collect information essential to addressing an affected population's culturally important concerns and needs (for example, subsistence consumption of fish, vegetation, and wildlife; unique ceremonial lands; or water bodies, landforms, buildings, or vistas important to a population's culture). In some instances, outreach efforts scheduled for certain times and places may be the only way to gather that information.

To read the CEQ Guidance, see CEQ's website at: [http://www.epa.gov/compliance/ej/resources/policy/ej\\_guidance\\_nepa\\_ceq1297.pdf](http://www.epa.gov/compliance/ej/resources/policy/ej_guidance_nepa_ceq1297.pdf).

### **B.8.2.4. Memorandum of Understanding on Environmental Justice and Executive Order 12898 (August 4, 2011)**

The participating Federal agencies (which includes the FAA) of this MOU agree to declare the continued importance of identifying and addressing environmental justice considerations in their programs, policies, and activities as provided in Executive Order 12898. Agencies agree to renew the process under Executive Order 12898 for agencies to provide environmental justice strategies and implementation progress reports. In addition, agencies agree to establish structures and procedures to ensure that the Interagency Working Group operates effectively and efficiently. Lastly, agencies agree to identify particular areas of focus to be included in agency environmental justice efforts.

To review this MOU, see [http://energy.gov/sites/prod/files/EJ\\_MOU\\_201108.pdf](http://energy.gov/sites/prod/files/EJ_MOU_201108.pdf)

### **B.8.2.5. Revised Department of Transportation Environmental Justice Strategy 2011**

In response to the Environmental Justice MOU (above), the DOT reviewed and updated the previous 1995 DOT Environmental Justice Strategy. This 2011 revised strategy continues to reflect DOT's commitment to environmental justice principles and to integrating those principles

into DOT programs, policies, and activities. The DOT continues to rely upon existing authorities for achieving environmental justice, as well as conforming to the commitments and focus areas set forth in the Environmental Justice MOU (i.e., implementation of NEPA, implementation of Title VI, impacts from climate change, and impacts from commercial transportation and supporting infrastructure).

To review this MOU, see [http://www.fhwa.dot.gov/environment/environmental\\_justice/ej\\_at\\_dot/dot\\_ej\\_strategy/](http://www.fhwa.dot.gov/environment/environmental_justice/ej_at_dot/dot_ej_strategy/)

## B.9. Water Resources

The following statutes, orders, and regulations govern the protection of wetlands, floodplains, surface waters, and groundwater.

### B.9.1. Wetlands

#### B.9.1.1. Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating the discharge of pollutants into *waters of the United States*,<sup>13</sup> which include wetlands. Pollutants regulated under the CWA include *priority pollutants* which include various toxic pollutants; *conventional pollutants*, such as biochemical oxygen demand, total suspended solids, fecal coliform, oil and grease, and pH; and *non-conventional pollutants*, which include any pollutant not identified as either priority or conventional. The two primary sections of the CWA relating to wetland impacts and permitting are Section 404 and Section 401. See the EPA website on the CWA at: <http://www2.epa.gov/laws-regulations/summary-clean-water-act>

#### *Section 404*

Section 404 establishes a program to regulate the discharge of dredged or fill material into waters of the United States. Jointly administered by the U.S. Army Corps of Engineers (USACE) and the EPA, the USACE is responsible for the day-to-day administration of Section 404 and the review of Section 404 permit applications.<sup>14</sup> The EPA provides general program oversight. The fundamental rationale of the Section 404 permit program is that no discharge of dredged or fill material should be permitted if there is a practicable alternative that would be less damaging to the nation's aquatic resources, or if significant degradation would occur to the nation's waters.

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<sup>13</sup> A *water of the United States* is considered a jurisdictional surface water or wetland under the CWA; the regulatory definition is found at 33 CFR § 328.3(a), and further guidance is found in the EPA/USACE Memorandum "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*." Any surface water not meeting this definition is considered non-jurisdictional, and therefore has no statutory protection under the CWA. It is important to note that not all surface waters are considered jurisdictional under the CWA. This determination is made on a case-by-case basis by the USACE; as a result, the FAA should consult with the USACE to determine the jurisdictional status of any surface water that may be affected by a proposed action or alternative(s).

<sup>14</sup> The CWA provides states with the option of administering the Section 404 permit program. To date, Michigan and New Jersey are the only states with this authority (40 CFR §§ 233.70-233.71).



As a result, before conducting dredge or fill activities in waters of the United States, including wetlands, the USACE must issue a permit authorizing such activities.

For additional guidance and information on Section 404 of the CWA, see the EPA website on Section 404 located at: <http://water.epa.gov/lawsregs/guidance/wetlands/sec404.cfm>.

### ***Section 401***

Section 401 ensures that Federal actions do not impair water quality. Section 401 requires that, prior to approval of any Federal action which may result in discharge into waters of the United States (such as a Section 404 permit), permit applicants must first receive a Section 401 water quality certification. The EPA has granted all states and 36 Native American tribes the authority to issue water quality certifications under Section 401. Before the USACE can issue a Section 404 permit, a Section 401 water quality certification must first be obtained. In most cases, Section 401 certification reviews are conducted at the same time as Section 404 permit reviews, as many states have established joint permit processes to ensure this occurs.

For additional guidance and information on Section 401 of the CWA, see the EPA website on Section 401 located at: <http://water.epa.gov/type/wetlands/outreach/fact24.cfm>.

### **B.9.1.2. Fish and Wildlife Coordination Act**

The Fish and Wildlife Coordination Act requires Federal agencies to consult with the USFWS, NMFS (in some instances), and appropriate state fish and wildlife agencies regarding the conservation of wildlife resources when proposed Federal projects may result in control or modification of the water of any stream or other water body (including wetlands). The Act provides for financial and technical assistance to states to develop conservation plans, subject to approval by the DOI, and implement state programs for fish and wildlife resources. The Act also encourages all Federal departments and agencies to utilize their statutory and administrative authority, to the maximum extent practicable and consistent with each agency's statutory responsibilities, to conserve and promote the conservation of non-game fish and wildlife and their habitats. Coordination with the USFWS and state wildlife agencies may be necessary if the proposed project has the potential to impact applicable water bodies.

For additional information on the Fish and Wildlife Coordination Act, see the USFWS website located at: <http://www.fws.gov/laws/lawsdigest/fwcoord.html>.

### **B.9.1.3. Executive Order 11990, *Protection of Wetlands***

Executive Order 11990, *Protection of Wetlands*, 42 *Federal Register* 26961, (May 25, 1977) directs all Federal agencies to avoid adverse impacts associated with the destruction or modification of wetlands, to the extent practicable. The stated purpose of this Executive Order is to “minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.” To meet these objectives, this Executive Order requires Federal agencies to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. If use of wetland is proposed, the FAA must make a *finding* where an alternatives analysis should demonstrate that there is no practicable alternative to the use of the wetland and that all practicable measures to minimize harm to the wetland have been included. This Executive Order applies to acquisition, management, and

disposition of Federal lands, as well as facilities construction and improvement projects which are undertaken, financed, or assisted by Federal agencies except for permits, licenses, or allocations to private parties for activities involving wetlands on non-Federal property. In addition, this Executive Order applies to Federal activities and programs affecting land use, including but not limited to, water and related land resources planning, regulation, and licensing activities. This Executive Order applies to all wetlands, whether they are considered jurisdictional under the CWA or not.

For additional guidance and information on this Executive Order, please see the EPA website at: <http://water.epa.gov/lawsregs/guidance/wetlands/eo11990.cfm>.

#### **B.9.1.4. DOT Order 5660.1A, *Preservation of the Nation's Wetlands***

This DOT Order implements the guidelines set forth in Executive Order 11990. As stated in this DOT Order, transportation facilities should be planned, constructed, and operated in order to assure the protection and enhancement of wetlands (though as stated in Paragraph 4.b of DOT Order 5660.1A, this does not include routine repairs and maintenance of existing facilities). To comply with this DOT Order, the FAA should provide the public and agencies with special interest in wetlands appropriate opportunity for early review of proposals involving new construction in wetlands.

To view the full text of this DOT Order visit: <http://www.dot.ca.gov/ser/voll/sec1/ch1fedlaw/USDOTOrder56601A.pdf>

### **B.9.2. Floodplains**

#### **B.9.2.1. National Flood Insurance Act**

The National Flood Insurance Act established the National Flood Insurance Program (NFIP), which is implemented by FEMA. NFIP is a voluntary floodplain management program for communities (cities, towns, or counties). Communities that participate must adopt sound floodplain management programs, and in exchange, the Federal government makes floodplain insurance available to the community to protect against financial losses. Any action within a FEMA-mapped floodplain in a participating community must follow the community's FEMA-approved floodplain management regulations.

For additional guidance and information on the NFIP, please visit <http://www.fema.gov/national-flood-insurance-program>.

#### **B.9.2.2. Executive Order 11988, *Floodplain Management***

Executive Order 11988, *Floodplain Management*, 42 *Federal Register* 26951, (May 25, 1977) requires Federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of 100-year floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. To accomplish this objective, Federal agencies should take action to reduce floodplain loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out their responsibilities.

For additional information on this Executive Order, see FEMA's website at:

<https://www.fema.gov/environmental-planning-and-historic-preservation-program/executive-order-11988-floodplain-management>

### **B.9.2.3. DOT Order 5650.2, *Floodplain Management and Protection***

DOT Order 5650.2 directs transportation agencies on how to implement Executive Order 11988.

For additional information on DOT Order 5650.2, see the DOT website at: <http://isddc.dot.gov/OLPFiles/DOT/007652.pdf>

## **B.9.3. Surface Waters**

### **B.9.3.1. Clean Water Act**

The sections of the CWA relating to waters of the United States are Section 303(d), Section 404, Section 401, and Section 402.

#### ***Section 303(d)***

Under Section 303(d) of the CWA, states, territories, and authorized tribes are required to develop lists of *impaired waters*. *Impaired waters* listed under Section 303(d) are those waters that do not meet water quality standards that states, territories, and authorized tribes have set for them, even after minimum pollution control standards for direct sources of pollution have been installed. The law requires that these jurisdictions establish priority rankings for waters on the list and develop total maximum daily loads of pollutants for these waters. The Section 303(d) list of impaired waters should be reviewed to determine if any impaired waters are present in a project's study area.

For additional information on impaired waters or to see a list of potential impaired waters in the study area, please visit the EPA's website at: <http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/>.

#### ***Sections 404 and 401***

For discussion of Sections 404 and 401, see "Wetlands" above. These CWA sections also apply for jurisdictional non-wetland surface waters.

#### ***Section 402***

Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permit program. This program controls direct or *point source* discharges into waters of the United States. In most cases, the NPDES permit program is administered by authorized states and may be referred to as the State Pollutant Discharge Elimination System permit program. NPDES permits, issued by either the EPA or an authorized state/tribe, contain industry-specific, technology-based, and/or water-quality-based limits, and establish pollutant monitoring and reporting requirements.

The NPDES Stormwater Program regulates the discharge of polluted stormwater run-off into the waters of the United States due to industrial and construction-related activities. In general, all

construction activities disturbing 1 acre (43,560 ft<sup>2</sup>) of land or larger require coverage under a NPDES Construction General Permit. Under this NPDES permit, the construction site is considered the *point source*.

For additional guidance and information on Section 402 of the CWA, see the EPA website on Section 402 at: <http://water.epa.gov/lawsregs/guidance/wetlands/section402.cfm>.

### **B.9.3.2. Fish and Wildlife Coordination Act**

See discussion above under “Wetlands.”

### **B.9.3.3. Rivers and Harbors Act**

The Rivers and Harbors Act was established to protect the navigability of waters used for commerce in the United States. Section 9 of the Act prohibits the construction of any bridge, dam, dike, or causeway over or in navigable waterways of the United States without approval. As defined by the Act, *navigable waters of the United States* are those waters that are subject to the change in the tide and/or are used, have been used in the past, or may be susceptible to use to transport interstate or foreign commerce (see 33 CFR part 329). Administration of Section 9 of the Act has been delegated to the U.S. Coast Guard (USCG). As a result, any bridges or causeways built over navigable waters require a permit from the USCG.

Section 10 of the Act requires authorization from the USACE for the construction of any structure in, over, or under a navigable water, and for the excavation/dredging or deposition of material, or any obstruction or alteration in any navigable water. Structure or work outside the limits defined as navigable waters require a Section 10 permit if the structure or work affects the course, location, condition, or capacity of the surface water (for example, the construction of a new transmission line that is outside the limits of a navigable water but spans the navigable water).

For additional information and guidance on the Rivers and Harbors Act, visit the USACE website and its description of the Rivers and Harbors Act at: <http://www.sam.usace.army.mil/Missions/Regulatory/RegulatoryFAQ/RiversandHarborsAppropriationActof1899.aspx>

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## Appendix C. Guidance on Using the Aviation Environmental Design Tool (AEDT) 2b to Conduct Environmental Modeling for FAA Actions Subject to NEPA

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July 16, 2015

### **Purpose**

This appendix provides information on the use of AEDT 2b to conduct environmental modeling of aircraft noise, fuel burn, and emissions for FAA actions subject to the National Environmental Policy Act (NEPA).

### **Applicability**

Aircraft noise, fuel burn, and emissions are interdependent and occur simultaneously throughout all phases of flight. AEDT 2b is a comprehensive software tool that provides information to FAA and its stakeholders on each of these specific environmental impacts. AEDT 2b facilitates environmental review activities required under NEPA by consolidating the modeling of these environmental impacts in a single tool.

For air traffic airspace and procedure actions, AEDT 2b replaces AEDT 2a, which was released by the FAA in March 2012. For other FAA actions, AEDT 2b replaces the Integrated Noise Model (INM) for analyzing aircraft noise and the Emissions and Dispersion Modeling System (EDMS) for developing emissions inventories and modeling emissions dispersion. AEDT 2b applies to analyses initiated after May 29, 2015.

While the AEDT 2b User Guide provides information on default data and how to use AEDT, this appendix provides information on how to use the tool to satisfy the requirements of NEPA in accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and related FAA guidance documents.

This appendix is organized to reflect the ways in which AEDT is used to conduct different types of studies (or use cases), depending on the metric(s) of interest. There are five sections:

- Emissions Inventory Only
- Emissions Inventory and Emissions Dispersion
- Emissions Inventory and Noise
- Emissions Inventory, Emissions Dispersion, and Noise
- Non-Default Methods and Data

## 1. Emissions Inventory Only

An emissions inventory provides the total amount or mass of pollutants generated by various sources during a specific period of time. More advanced inventories may also spatially allocate emissions for specific source purposes. This section describes guidance to develop aviation emissions inventories for FAA actions.

Aviation sources and characteristics are tabulated in Table 3-2 of the FAA *Aviation Emissions and Air Quality Handbook Version 3*, hereafter referred to as the *Air Quality Handbook*.

AEDT can model the following types of emission sources:<sup>1</sup>

- Point sources: stacks from boilers, turbines, generators, and cooling towers;
- Area sources: activity at aircraft gate aprons (aircraft at startup, Ground Support Equipment [GSE] operations, and Auxiliary Power Unit [APU] activity), aircraft taxiing, queuing, accelerating on the runway, and in takeoff, climb-out, and approach modes; and
- Volume sources: any source with both area and height elements, e.g., fuel storage facility.

Emissions from on-road mobile ground sources (such as ground access vehicles) cannot be modeled with AEDT but may be modeled independently using the EPA MOVES model.

This section provides guidance on the following elements of an emissions inventory analysis:

- Representation of results;
  - Aircraft operations and schedules;
  - Use of weather information; and
  - Flight paths.

The outputs of the emissions analysis are tables showing the total amount of each target compound emitted by each source under specified conditions and time periods.

### 1.1 Representation of results

Emissions inventory results are generally tabulated in tons of pollutant or compound for the time period of interest—typically in units of tons per year. Results may be aggregated for the entire study area, or segregated by emissions source or by proposed action and alternative(s).<sup>2</sup>

#### 1.1.1 Criteria pollutants

When an emissions inventory of criteria pollutants<sup>3</sup> is conducted,<sup>4</sup> it should report the total sum of criteria pollutants emitted from all sources within the study area (i.e., the area potentially

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<sup>1</sup> *Air Quality Handbook*, Appendix D, section D.2.2.

<sup>2</sup> *Air Quality Handbook*, section 4.1.2.

<sup>3</sup> *Air Quality Handbook*, section 3.2.1.

<sup>4</sup> Section 4.1.2 of the *Air Quality Handbook* provides guidance on selecting an appropriate air quality assessment methodology. Aircraft emissions above the mixing height (or 3,000 ft. AFE when the mixing height is not identified in the applicable SIP or TIP) are exempt from study as they have been determined to be *de minimis*. 40 CFR §93.153(c)(2)(xxii); see also 75 Fed. Reg. 17257-17258 (April 5, 2010).

affected by criteria pollutant emissions from the proposed action and alternative(s)) extending from the ground surface up to the local mixing height (or 3,000 ft. above ground level [AGL] where the mixing height is not identified in the applicable State Implementation Plan [SIP] or Tribal Implementation Plan [TIP]). The mixing height is the top of the vertical region of the atmosphere in which pollutant mixing occurs and affects ground level concentrations. Above this height, pollutants that are released generally do not mix with ground level emissions and do not have an effect on ground level concentrations in the local area.

See Table 6-2 of the *Air Quality Handbook* for an example of an operational emissions inventory.

Construction emissions, while they are generally temporary in nature, are also commonly reported in tons per year. See section 6.1.4.2 of the *Air Quality Handbook* for more information. Note that AEDT does not compute construction emissions.

For purposes of compliance with NEPA and the Clean Air Act, emissions inventory reporting is primarily intended to: (1) disclose the differences in pollutant emissions between the project alternatives (i.e., action vs. no-action); and (2) demonstrate that, in nonattainment and/or maintenance areas, the proposed action is below the appropriate General Conformity *de minimis* thresholds.<sup>5</sup> If the proposed action is above the appropriate *de minimis* thresholds, consult the *Air Quality Handbook* for advanced compliance steps.<sup>6</sup>

### 1.1.2 Hazardous air pollutants

The type(s) and number of hazardous air pollutants (HAPs) reported in an airport-related emissions inventory will depend on the types of sources evaluated, the types of fuel used, and other emissions characteristics. See section 6.2 and Appendix B of the *Air Quality Handbook* for more information.

### 1.1.3 Fuel burn and greenhouse gas emissions

When greenhouse gas (GHG) emissions are inventoried,<sup>7</sup> they are computed based on fuel burn, energy usage, and/or activity levels of the various sources. The only GHG emissions AEDT calculates are CO<sub>2</sub> emissions from aircraft engines. For computing GHG emissions not modeled by AEDT, see Appendix C of the *Air Quality Handbook*.

If fuel burn and GHG emissions are computed as part of a NEPA analysis,<sup>8</sup> they should be reported for the full extent of aircraft movements as part of the project changes with no altitude restriction (not constrained by the mixing height). Fuel burn and GHG evaluation should include the same emission sources that are included in the air quality analysis.

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<sup>5</sup> *Air Quality Handbook*, Tables 8-1 and 8-2.

<sup>6</sup> *Air Quality Handbook*, Chapter 8. If dispersion modeling is conducted, see Section 2.1.2 of this guidance regarding use of the results of such modeling for NEPA and Clean Air Act compliance.

<sup>7</sup> For guidance regarding when GHG emissions should be quantified, see Section 3 of this Desk Reference.

<sup>8</sup> For NEPA reviews, GHG emissions should be quantified when fuel burn is computed and reported in the NEPA document. See Section 3 of this Desk reference.

## 1.2 Aircraft operations and schedules

Aircraft emissions for an emissions inventory are computed in AEDT by factoring total aircraft operational activity against a database of aircraft/engine-specific emission factors based on engine manufacturer, model, and aircraft operational mode. AEDT calculates a performance-based time in mode for the takeoff, approach, and climb out components of the Landing and Take-Off (LTO) cycle, which is based upon aircraft flight profiles, characteristics of individual aircraft, and meteorological conditions. For an emissions inventory, AEDT uses static times in mode for ground-based aircraft movements.<sup>9</sup> AEDT allows the input of times in mode explicitly per event, configuration of the ground delay and sequencing function, or the application of airport static times in mode.

Aircraft operations inputs to compute an emissions inventory, fuel burn, or GHG emissions may include:

- Number of operations (i.e., landings and takeoffs) by each aircraft in the year(s) of study;
- Fleet mix, specifying each airframe and engine;
- Aircraft flight paths;
- Aircraft ground movements;
- Taxi times-in-mode (per event, delay/sequencing, or airport static); and
- For more detailed emissions analyses, include operational profile(s) (i.e., number of flights in the month, day, and hour or quarter-hour relative to the peak).

Non-aircraft operations inputs may include:

- Auxiliary power units;
- Ground support equipment, e.g., aircraft tugs, air start units, loaders, tractors, fuel or hydrant trucks;
- Stationary sources, e.g., boilers, heaters, generators, snowmelters, incinerators, fire training facilities, fuel storage tanks, painting operations, de-icing and anti-icing operations, salt/sand storage.

Appendix F of the *Air Quality Handbook* provides details of the data needed for each input of airport operations.

## 1.3 Use of weather information

AEDT default weather data include average annual weather (i.e., based on 30-year normals and 10-year averages) for each airport,<sup>10</sup> as well as International Standard Atmosphere (ISA) conditions.<sup>11</sup> In addition, AEDT accepts more detailed weather data (in space and/or time). Default or more detailed weather for each airport may be selected, depending on the type of analysis.

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<sup>9</sup> *Air Quality Handbook*, section 6.1.3.

<sup>10</sup> Data acquired from NOAA National Climatic Data Center: <http://www.ncdc.noaa.gov/oa/ncdc.html>.

<sup>11</sup> The International Standard Atmosphere is an atmospheric model of how the pressure, temperature, density, and viscosity of the Earth's atmosphere change over a wide range of altitudes.



While there is no singular, standard weather data source requirement to compute an emissions inventory, AEDT default weather data are typically acceptable. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of weather and its potential influence in a specific study.

The same weather source used to compute the emissions inventory of criteria pollutants should be used to compute fuel burn and CO<sub>2</sub> emissions.

#### **1.4 Flight paths**

Aircraft operations are modeled on ground tracks. AEDT 2b allows for the development of studies with ground track geometry that include both straight and curved flight paths. For analyses that include an emissions inventory, modeled ground tracks should approximate actual flight paths in the study area. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of ground tracks.

## 2 Emissions Inventory and Emissions Dispersion

An emissions inventory provides the total amount or mass of pollutants generated by various sources during a specific period of time. More advanced inventories may also spatially allocate emissions for specific source purposes.

Emissions dispersion modeling is used to further refine the results of an emissions inventory. Emissions dispersion modeling is the process by which the dispersal of atmospheric pollutants is simulated and assessed under the effects of meteorological, terrain, and other influencing factors. In other words, emissions dispersion modeling carefully calculates the pollutant concentrations in units of mass per volume from the source to a receptor, taking into account meteorological influences.

The dispersion model used by AEDT is AERMOD, which is a modern Gaussian plume model that computes dispersion of air pollutant emissions spread in the horizontal and vertical directions, determined as a function of atmospheric stability and distance from the emission source.<sup>12</sup>

AEDT can model the following types of emission sources:<sup>13</sup>

- Point sources: stacks from boilers, turbines, generators, and cooling towers;
- Area sources: activity at aircraft gate aprons (aircraft at startup, GSE operations, and APU activity), aircraft taxiing, queuing, accelerating on the runway, and in takeoff, climb-out, and approach modes; and
- Volume sources: any source with both area and height elements, e.g., fuel storage facility.

Emissions from on-road mobile ground sources (such as ground access vehicles) cannot be modeled with AEDT but may be modeled independently using the EPA MOVES model. A detailed explanation of emissions dispersion requirements is provided in the *Air Quality Handbook* in section 7 and Appendix D.

This section provides guidance on the following elements of an analysis that includes an emissions inventory and emissions dispersion:

- Representation of results;
- Aircraft operations and schedules;
- Use of weather information;
- Flight paths; and
- Use of terrain information.

Section 1 provides details on conducting an emissions inventory. This section provides additional information applicable to a study that also includes emissions dispersion.

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<sup>12</sup> EPA Preferred/Recommended Models: [http://www.epa.gov/scram001/dispersion\\_prefrec.htm](http://www.epa.gov/scram001/dispersion_prefrec.htm).

<sup>13</sup> *Air Quality Handbook*, Appendix D, section D.2.2.

## 2.1 Representation of results

Emissions inventory results are generally tabulated in tons of pollutant or compound for the time period of interest—typically in units of tons per year. Results may be aggregated for the entire study area, or segregated by emissions source or by proposed action and alternative(s).<sup>14</sup>

Emissions dispersion results may be presented in both tabular and graphical displays. They include short-term (1-, 3-, 8-, 24-hour) and long-term (annual) average concentrations reported in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) by AEDT at each receptor location, depending on the type of analysis and the National Ambient Air Quality Standards (NAAQS) for each criteria pollutant. AEDT does not model lead, and the rolling 3-month average concentrations are not included in tabular or graphical displays. Lead may be modeled independently of AEDT.<sup>15</sup>

The following sections provide information on emissions dispersion receptors and criteria pollutants. Sections 1.1.2, 1.1.3, and 1.1.4 provide information on computing emissions inventories for hazardous air pollutants (HAPs), greenhouse gases (GHGs), and fuel burn, respectively. Such inventories do not include dispersion modeling. The science of HAPs reactions in the atmosphere and downstream plume evolution is still evolving and the level of understanding is currently limited.<sup>16</sup> Therefore, due to the state of the science, dispersion modeling is not conducted for HAPs. The global nature of GHGs makes it inappropriate for dispersion modeling.

### 2.1.1 Emissions dispersion receptors

Encompassed within the study area (i.e., the area potentially affected by criteria pollutant emissions from the proposed action and alternative(s)) are all sources of emissions that directly affect the local area concentrations. In AEDT, emissions dispersion receptors are locations where pollutant concentrations are evaluated. Pollutant concentrations should be predicted at a sufficient number of receptor locations to identify the maximum concentrations. If an overall view of pollutant concentration is desired, then a grid of receptors should be defined. The dispersion analysis should include enough receptors to sufficiently describe pollutant concentrations in the study area. Appendix D of the *Air Quality Handbook* provides additional information on emissions dispersion receptors.

### 2.1.2 Criteria pollutants

When an emissions inventory of criteria pollutants<sup>17</sup> is conducted,<sup>18</sup> it should be reported within the study area (i.e., the area potentially affected by criteria pollutant emissions from the proposed action and alternative(s)) extending from the ground surface up to the local mixing height (or 3,000 ft. AGL where the mixing height is not identified in the applicable SIP or TIP). The

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<sup>14</sup> *Air Quality Handbook*, section 4.1.2.

<sup>15</sup> EPA, Calculating Piston-Engine Aircraft Airport Inventories for Lead for the 2008 National Emissions Inventory, December 2010, EPA-420-B-10-044.

<sup>16</sup> *Air Quality Handbook*, section 6.2.3.

<sup>17</sup> *Air Quality Handbook*, section 3.2.1.

<sup>18</sup> Section 4.1.2 of the *Air Quality Handbook* provides guidance on selecting an appropriate air quality assessment methodology. Aircraft emissions above the mixing height (or 3,000 ft. AFE when the mixing height is not identified in the applicable SIP or TIP) are exempt from study as they have been determined to be *de minimis*. 40 CFR §93.153(c)(2)(xxii); see also 75 Fed. Reg. 17257-17258 (April 5, 2010).

mixing height is the top of the vertical region of the atmosphere in which pollutant mixing occurs and affects ground level concentrations. Above this height, pollutants that are released generally do not mix with ground level emissions and do not have an effect on ground level concentrations in the local area.

See Table 6-2 of the *Air Quality Handbook* for an example of an operational emissions inventory.

When emissions dispersion modeling is conducted at airports, it generally includes CO, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>; dispersion modeling of SO<sub>2</sub> and Pb are less frequently conducted due to their expected low ambient levels<sup>19</sup> and generally low emissions in terms of aviation sources. AEDT dispersion modeling predicts total NO<sub>2</sub> concentrations using the Tier 1 method, which assumes all NO<sub>x</sub> as NO<sub>2</sub> for comparison to the NAAQS.<sup>20</sup> Ozone is a regional pollutant resulting primarily from the combined effects of VOCs and NO<sub>x</sub> in the presence of sunlight and thus not conducive to dispersion modeling on a local scale.

Dispersion modeling results consist of the time-weighted maximum or average concentrations of pollutants at each receptor analyzed over a specified time period, depending on the type of analysis and NAAQS for each criteria pollutant. For purposes of compliance with NEPA and the Clean Air Act, the reporting is primarily intended to: (1) disclose the differences in pollutant concentrations between the project alternatives (i.e., action vs. no-action); (2) show whether any of the action alternative(s) would result in exceedance of the NAAQS in attainment areas; and (3) demonstrate that, in nonattainment and/or maintenance areas, the proposed action will not cause or contribute to a violation of any NAAQS nor delay the attainment of any NAAQS.**Error! Bookmark not defined.**

Appendix D of the *Air Quality Handbook* provides additional information on dispersion modeling.

## 2.2 Aircraft operations and schedules

Aircraft emissions for an emissions inventory and the emissions dispersion computation that follow are computed in AEDT by factoring total aircraft operational activity against a database of aircraft/engine-specific emission factors based on engine manufacturer, model, and aircraft operational mode. AEDT calculates a performance-based time in mode for the takeoff, approach and climb out components of the LTO cycle, which is based upon aircraft flight profiles, characteristics of individual aircraft, and meteorological conditions. For an emissions dispersion analysis, ensure that emissions from aircraft ground movements are properly located in time and space. This can be achieved by using AEDT's ground delay and sequencing function, which models aircraft ground locations in time and space based on airport layout and capacity parameters.

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<sup>19</sup> *Air Quality Handbook*, section 7.1.4.

<sup>20</sup> Appendix W to 40 CFR part 51 – Guideline on Air Quality Models, <http://www.ecfr.gov/cgi-bin/text-idx?SID=e6a5b817b94abf58460f48c032d9a39c&node=40:2.0.1.1.2.23.11.5.37&rgn=div9>.

Aircraft operations inputs to compute an emissions inventory, emissions dispersion, fuel burn, or GHG emissions may include:

Number of operations (i.e., landings and takeoffs) by each aircraft in the year(s) of study;

Fleet mix, specifying each airframe and engine;

Aircraft flight paths;

- Aircraft ground movements, represented in time and space;
- Airport layout and capacity parameters; and
- Operational profile(s) (i.e., number of flights in the month, day, and hour or quarter-hour relative to the peak).

As an alternative to number of operations and operational profile(s), a detailed schedule of annual operations (i.e., time-stamped flights for the year of study, which includes the fleet and operations for the entire year) may be provided.

Non-aircraft operations inputs may include:

Auxiliary power units;

Ground support equipment, e.g., aircraft tugs, air start units, loaders, tractors, fuel or hydrant trucks;

Stationary sources, e.g., boilers, heaters, generators, snowmelters, incinerators, fire training facilities, fuel storage tanks, painting operations, de-icing and anti-icing operations, salt/sand storage.

The *Air Quality Handbook* Appendix F provides details of the data needed for each input of airport operations.

### 2.3 Use of weather information

When emissions dispersion analysis is conducted, surface and upper air weather data must be used to compute both the emissions inventory and emissions dispersion analyses. There is no singular, standard weather data source for emissions inventory or dispersion computation. The weather data needed to compute emissions dispersion must meet EPA guidance<sup>21</sup> and the AERMOD format. Use of AERMET to form compliant weather input for AERMOD allows use of data sets from the National Weather Service (NWS), on-site data, or detailed one-minute data. For example, NCDC ASOS/Upper Air format meets the requirements to compute emissions dispersion. Conduct interagency coordination to determine the appropriate weather data to use for the analysis.

The same weather source used to compute the emissions inventory of criteria pollutants should be used to compute fuel burn and CO<sub>2</sub> emissions.

### 2.4 Flight paths

Aircraft operations are modeled on ground tracks. AEDT 2b allows for the development of studies with ground track geometry that include both straight and curved flight paths. For analyses that include an emissions inventory and emissions dispersion, modeled ground tracks

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<sup>21</sup> US EPA, "Meteorological Monitoring Guidance for Regulatory Modeling Applications," EPA-454/R-99-005, February 2000. <http://www.epa.gov/ttn/scram/guidance/met/mmgrma.pdf>.

should approximate actual flight paths in the study area. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of ground tracks.

## **2.5 Use of terrain information**

AEDT 2b allows users to import terrain files and use terrain data in emissions dispersion. When terrain is not applied in AEDT, the model computes receptor-to-source distances in the emissions dispersion calculations based on flat ground.

In regions where topography is relatively flat, use of terrain is not required for environmental studies. If there is uncertainty in the use of terrain and its potential influence on pollutant concentrations in a specific study, coordinate with the appropriate reviewing authority.

### 3 Emissions Inventory and Noise

An emissions inventory provides the total amount or mass of pollutants generated by various sources during a specific period of time. More advanced inventories may also spatially allocate emissions for specific source purposes.

AEDT can model the following types of emission sources:<sup>22</sup>

- Point sources: stacks from boilers, turbines, generators, and cooling towers;
- Area sources: activity at aircraft gate aprons (aircraft at startup, GSE operations, and APU activity), aircraft taxiing, queuing, accelerating on the runway, and in takeoff, climb-out, and approach modes; and
- Volume sources: any source with both area and height elements, e.g., fuel storage facility.

Emissions from on-road mobile ground sources (such as ground access vehicles) cannot be modeled with AEDT but may be modeled independently using the EPA MOVES model.

Noise exposure modeling identifies locations exposed to specified levels of aircraft-generated noise, both in and outside the project location. The standard noise metric is the yearly day-night average sound level (DNL or  $L_{dn}$ ). Community Noise Equivalent Level (CNEL) may be used in lieu of DNL for noise analysis of FAA actions in California.

While aircraft emissions inventories are primarily a function of aircraft fleet mix and operational schedules, the noise generated by aircraft is also affected by additional factors, including weather, the local terrain, the locations and usage of specific flight paths, and the weight of departing aircraft (as heavier aircraft have a slower rate of climb and wider noise dispersion).

This section provides guidance on the following elements of an analysis that includes emissions inventory and noise:

- Representation of results;
- Aircraft operations and schedules;
- Use of weather information;
- Flight paths;
- Use of terrain information; and
- Use of lateral attenuation for propeller aircraft and helicopters.

Section 1 provides details on conducting an emissions inventory. This section provides additional information applicable to a study that includes both noise and an emissions inventory.

#### 3.1 Representation of results

When an emissions inventory of criteria pollutants<sup>23</sup> is conducted,<sup>24</sup> it should be reported within

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<sup>22</sup> *Air Quality Handbook*, Appendix D, section D.2.2

<sup>23</sup> *Air Quality Handbook*, section 3.2.1.

the study area (i.e., the area potentially affected by criteria pollutant emissions from the proposed action and alternative(s)) extending from the ground surface up to the local mixing height (or 3,000 ft. AGL where the mixing height is not identified in the applicable SIP or TIP). The mixing height is the top of the vertical region of the atmosphere in which pollutant mixing occurs and affects ground level concentrations. Above this height, pollutants that are released generally do not mix with ground level emissions and do not have an effect on ground level concentrations in the local area.

For noise analysis of airport actions, the study area must be large enough to include the area within the DNL 65 dB contour, and may be larger.<sup>25</sup> For noise analysis of air traffic airspace and procedure actions, the study area may extend vertically from the ground to 10,000 ft. AGL, or up to 18,000 ft. AGL if the proposed action or alternative(s) are over a national park or wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.<sup>26</sup>

If fuel burn and GHG emissions are computed as part of a NEPA analysis,<sup>27</sup> they should be reported for the full extent of aircraft movements as part of the project changes with no altitude restriction (not constrained by the mixing height). Fuel burn and GHG evaluation should include the same emission sources that are included in the air quality analysis.

Figure 3-1 is a sample of an impact set graph, which shows detailed comparative data for receptors exposed to specific ranges of noise. The *Change Summary* table in Figure 3-1 provides a summary of the number of receptors or the population count that has either entered or exited the 65 dB or greater criteria for a comparison of two scenarios.<sup>28</sup> Table 3-1 is a sample format for reporting changes in noise exposure levels for specific noise-sensitive locations for air traffic airspace and procedure actions. It should be noted that there is more than one way to present this information, and the tables below are provided as examples only and should not be considered as a required format.

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<sup>24</sup> Section 4.1.2 of the *Air Quality Handbook* provides guidance on selecting an appropriate air quality assessment methodology. Aircraft emissions above the mixing height (or 3,000 ft. AFE when the mixing height is not identified in the applicable SIP or TIP) are exempt from study as they have been determined to be *de minimis*. 40 CFR §93.153(c)(2)(xxii); see also 75 Fed. Reg. 17257-17258 (April 5, 2010).

<sup>25</sup> If DNL 1.5 dB increases are documented within the DNL 65 dB for an action in the immediate vicinity of an airport, the NEPA document must also identify noise sensitive areas where noise is projected to increase by DNL 3 dB or more within the DNL 60-65 dB contours. Disclosure of noise impacts outside the DNL 65 dB contour may also be warranted in connection with the consideration of noise impacts in areas where the land use compatibility guidelines in 14 CFR part 150 may not be relevant. See FAA Order 1050.1F, Appendix B, paragraph B-1.4.

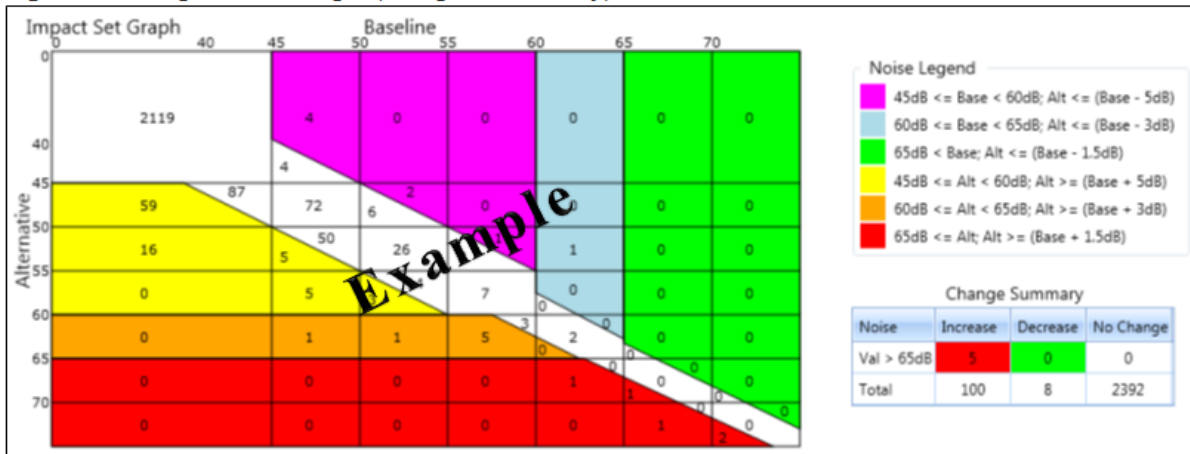
<sup>26</sup> See FAA Order 1050.1F, Appendix B, paragraph B-1.3; FAA Order 7400.2K, section 32-2-1.b.2.

<sup>27</sup> For NEPA reviews, GHG emissions should be quantified when fuel burn is computed and reported in the NEPA document. See Section 3 of this Desk reference.

<sup>28</sup> AEDT 2b User Guide, section 5.6.7, View Impact Report.



Figure 3-1: Impact Set Graph (Sample Data Only)



Source: AEDT 2b User Guide

Table 3-1: Increased Noise Exposure at Sensitive Locations – 2014 (Sample Data Only)

Year	Location	Noise Exposure (DNL)		
		No Action	Proposed Action	Change
2014	XX State Wildlife Refuge <i>Street Address, Town, ST</i>	45.4	48.5	3.1
2014	St XX Church <i>Street Address, Town, ST</i>	45.1	47.6	2.5
2014	XXX Hospital <i>Street Address, Town, ST</i>	46.9	52.1	5.2

### 3.2 Aircraft operations and schedules

Aircraft operations are the flight schedule information input to AEDT to compute aircraft performance and affect environmental results. Inputs include fleet mix (i.e., airframe, engine), number of operations, and operational profile (i.e. the distribution of operations over time).

Aircraft operations inputs to compute noise, an emissions inventory, fuel burn, or GHG emissions may include:

- Number of operations by aircraft type in the year(s) of study;
- Fleet based on annual operations;
- Aircraft flight paths;
- Aircraft ground movements for emissions; and
- Number of day and night operations by aircraft type for the Day-Night Average Sound Level (DNL) noise metric. For the Community Noise Equivalent Level (CNEL) noise metric only, also include the number of evening operations by aircraft type.

Alternatively, a detailed schedule of annual operations (i.e., time-stamped flights for the year of study, which includes the fleet and operations for the entire year) may be provided. AEDT will annualize the data to an average annual day to compute the noise impact.

If delay and sequencing is applied to the aircraft operations in a noise metric result, the scheduled and actual time for each operation should be compared to determine whether there is a

change. Coordinate with the AEE-100 if there are differences between scheduled and actual times for noise operations that occur across the day and night time periods for the DNL metric or day, evening, and night time periods for the CNEL metric.

For emissions only, non-aircraft operations inputs may include:

- Auxiliary power units;

- Ground support equipment, e.g., aircraft tugs, air start units, loaders, tractors, fuel or hydrant trucks;

- Stationary sources, e.g., boilers, heaters, generators, snowmelters, incinerators, fire training facilities, fuel storage tanks, painting operations, de-icing and anti-icing operations, salt/sand storage.

### 3.3 Use of weather information

This section describes the use of weather data and atmospheric absorption.

#### 3.3.1 Weather data

AEDT default weather data include average annual weather (i.e., based on 30-year normals and 10-year averages) for each airport,<sup>29</sup> as well as International Standard Atmosphere (ISA) conditions.<sup>30</sup> In addition, AEDT accepts more detailed weather data (in space and/or time). Default or more detailed weather for each airport may be selected, depending on the type of analysis.

For airport actions, AEDT default airport-specific average weather conditions should be used to compute noise for the airport to be studied. Use of non-default weather data requires written approval from AEE (see section 5, Non-Default Methods and Data).

For air traffic airspace and procedure actions, AEDT default airport-specific average weather conditions for the airport(s) to be studied should be used to compute noise. Use of non-default weather data requires written approval from AEE (see section 5).

While there is no singular, standard weather data source requirement to compute an emissions inventory, the same AEDT default airport-specific average weather data are typically acceptable, when an emissions inventory is required.<sup>31</sup>

The same weather source used to compute the emissions inventory of criteria pollutants should be used to compute fuel burn and CO<sub>2</sub> emissions.

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<sup>29</sup> Data acquired from NOAA National Climatic Data Center: <http://www.ncdc.noaa.gov/oa/ncdc.html>.

<sup>30</sup> The International Standard Atmosphere is an atmospheric model of how the pressure, temperature, density, and viscosity of the Earth's atmosphere change over a wide range of altitudes.

<sup>31</sup> An aircraft emissions inventory is needed for studies where there are changes below the altitude of the airport's mixing height (or 3,000 ft. AFE where the mixing height is not identified in the applicable SIP or TIP). Aircraft emissions above the mixing height (or 3,000 ft. AFE when the mixing height is not identified) are exempt from study as they have been determined to be *de minimis*. 40 CFR §93.153(c)(2)(xxii); see also 75 Fed. Reg. 17257-17258 (April 5, 2010).

Coordinate with the appropriate FAA office if there is uncertainty regarding the use of weather and its potential influence in a specific study.

### **3.3.2 Atmospheric absorption [noise only]**

Atmospheric absorption is the calculation of the absorption of sound by the atmosphere due to weather conditions (temperature, relative humidity, atmospheric pressure, etc.). In AEDT 2b, the airport average weather conditions in the study are used to calculate atmospheric absorption adjustments to standard Noise-Power-Distance (NPD) curves.

For noise analyses of FAA actions, the atmospheric absorption type “SAE-ARP-5534” must be selected in AEDT Processing Options. This function uses the method described in Society of Automotive Engineers’ (SAE) Aerospace Recommended Practice (ARP) 5534, taking into account changes in atmospheric absorption due to airport specific temperature, relative humidity, and atmospheric pressure.

## **3.4 Flight paths**

### **3.4.1 Ground track geometry**

Aircraft operations are modeled on ground tracks. AEDT 2b allows for the development of studies that include both straight and curved ground track geometry. For analyses that include emissions inventory and noise, modeled ground tracks should approximate actual flight paths in the study area. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of ground tracks.

### **3.4.2 Track dispersion**

Ground tracks are typically consolidated, or “bundled,” to represent average movements around an airport in an analysis. The potential effects that the modeling technique of bundling ground tracks may have on study results should be considered, as there are different implications on noise, fuel burn, and emissions results. Specifically, care should be taken to ensure that bundled ground tracks and the aircraft types that are modeled on those tracks represent actual operations in the study area in terms of flight path dispersion around the airport and the aircraft types that fly those flight paths.

## **3.5 Use of terrain information**

AEDT 2b allows users to import terrain files and use terrain data in noise computations. When terrain is not applied in AEDT, the model computes receptor-to-source distances in the noise calculations based on flat ground.

In regions where topography is relatively flat, use of terrain is not required for environmental studies. If there is uncertainty in the use of terrain and its potential influence on noise exposure in a specific study, coordinate with the appropriate reviewing authority.

For noise analyses, terrain files can be applied with or without line-of-sight blockage. Although line-of-sight blockage is not required for environmental studies, it should be considered for analyses that have substantial terrain features located between the aircraft noise sources and the

noise receptors. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of line-of-sight blockage and its potential influence on noise exposure in a specific study.

### **3.6 Use of lateral attenuation for propeller aircraft and helicopters [noise only]**

For noise analyses, lateral attenuation describes the difference in sound level between the sound directly under an aircraft's flight path and at a location to the side of the aircraft. In AEDT 2b, the lateral attenuation adjustment is based on the methods described in the SAE Aerospace Information Report (AIR) 5662 "Method for Predicting Lateral Attenuation of Airplane Noise." It takes into account the following effects on aircraft sound due to over-ground propagation: (1) ground reflection effects; (2) atmospheric refraction effects; and (3) airplane shielding effects, as well as other ground and engine/aircraft installation effects.

AEDT 2b assumes that sound propagation occurs over acoustically soft ground (i.e. grass/trees), which is appropriate for the majority of analyses. AEDT 2b also has a setting to turn off lateral attenuation for flights from helicopters and propeller-driven airplanes, effectively assuming propagation over acoustically hard ground (i.e., pavement/water), while soft ground effects would still apply to other aircraft types.<sup>32</sup>

For noise analyses of FAA actions, lateral attenuation must be modeled for all aircraft types, including helicopters and propeller-driven airplanes, assuming acoustically soft ground (ensure that the box "*Use hard ground attenuation for helicopters and propeller aircraft*" is unchecked in AEDT Processing Options). Written approval from AEE-100 is required if the default lateral attenuation setting is not used. See section 5 on Non Default Methods and Data for information on request and approval processes.

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<sup>32</sup> Sometimes lateral attenuation is not used when source-to-receiver propagation occurs primarily over an acoustically hard surface (e.g., water), the hard surface dominates the study environment, and there are low-altitude helicopter and propeller-driven aircraft operations.

## 4 Emissions Inventory, Emissions Dispersion, and Noise

An emissions inventory provides the total amount or mass of pollutants generated by various sources during a specific period of time. More advanced inventories may also spatially allocate emissions for specific source purposes.

Emissions dispersion modeling is used to further refine the results of an emissions inventory. Emissions dispersion modeling is the process by which the dispersal of atmospheric pollutants is simulated and assessed under the effects of meteorological, terrain, and other influencing factors.

AEDT can model the following types of emission sources:<sup>33</sup>

- Point sources: stacks from boilers, turbines, generators, and cooling towers;
- Area sources: activity at aircraft gate aprons (aircraft at startup, GSE operations, and APU activity), aircraft taxiing, queuing, accelerating on the runway, and in takeoff, climb-out, and approach modes; and
- Volume sources: any source with both area and height elements, e.g., fuel storage facility.

Emissions from on-road mobile ground sources (such as ground access vehicles) cannot be modeled with AEDT but may be modeled independently using the EPA MOVES model. A detailed explanation of emissions dispersion requirements is provided in the *Air Quality Handbook* in section 7 and Appendix D.

Noise exposure modeling identifies locations exposed to specified levels of aircraft-generated noise, both in and outside the project location. The standard noise metric is the yearly day-night average sound level (DNL). Community Noise Equivalent Level (CNEL) may be used in lieu of DNL for noise analysis of FAA actions in California.

While aircraft emissions are primarily a function of aircraft fleet mix and operational schedules, the noise generated by aircraft and emissions dispersion are affected by additional factors, including weather, the local terrain, the locations and usage of specific flight paths, and the weight of departing aircraft (as heavier aircraft have a slower rate of climb and wider noise dispersion).

This section provides guidance on the following elements of an analysis that includes emissions inventory, emissions dispersion, and noise:

- Representation of results;
  - Aircraft operations and schedules;
  - Use of weather information;
  - Flight paths;
  - Use of terrain information; and
  - Use of lateral attenuation for propeller aircraft and helicopters.

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<sup>33</sup> *Air Quality Handbook*, Appendix D, section D.2.2

Section 1 provides details on conducting an emissions inventory. Section 2 provides details on conducting a study that includes an emissions inventory and emissions dispersion. Section 3 provides details on conducting an emissions inventory and a noise study. This section provides information applicable to a study that includes noise, an emissions inventory, and emissions dispersion.

#### 4.1 Representation of results

When an emissions inventory and emissions dispersion of criteria pollutants<sup>34</sup> is conducted,<sup>35</sup> it should be reported within the study area (i.e., the area potentially affected by criteria pollutant emissions from the proposed action and alternative(s)) extending from the ground surface up to the local mixing height (or 3,000 ft. AGL where the mixing height is not identified in the applicable SIP or TIP). The mixing height is the top of the vertical region of the atmosphere in which pollutant mixing occurs and affects ground level concentrations. Above this height, pollutants that are released generally do not mix with ground level emissions and do not have an effect on ground level concentrations in the local area.

For noise analysis of airport actions, the study area must be large enough to include the area within the DNL 65 dB contour, and may be larger.<sup>36</sup> For noise analysis of air traffic airspace and procedure actions, the study area may extend vertically from the ground to 10,000 ft. AGL, or up to 18,000 ft. AGL if the proposed action or alternative(s) are over a national park or wildlife refuge where other noise is very low and a quiet setting is a generally recognized purpose and attribute.<sup>37</sup>

If fuel burn and GHG emissions are computed as part of a NEPA analysis,<sup>38</sup> they should be reported for the full extent of aircraft movements as part of the project changes with no altitude restriction (not constrained by the mixing height). Fuel burn and GHG evaluation should include the same emission sources that are included in the air quality analysis.

Section 2.1 provides information on receptor locations and reporting results for emissions dispersion. Section 3.1 provides this information for noise.

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<sup>34</sup> *Air Quality Handbook*, section 3.2.1.

<sup>35</sup> Section 4.1.2 of the *Air Quality Handbook* provides guidance on selecting an appropriate air quality assessment methodology. Aircraft emissions above the mixing height (or 3,000 ft. AFE when the mixing height is not identified in the applicable SIP or TIP) are exempt from study as they have been determined to be *de minimis*. 40 CFR §93.153(c)(2)(xxii); see also 75 Fed. Reg. 17257-17258 (April 5, 2010).

<sup>36</sup> If DNL 1.5 dB increases are documented within the DNL 65 dB for an action in the immediate vicinity of an airport, the NEPA document must also identify noise sensitive areas where noise is projected to increase by DNL 3 dB or more within the DNL 60-65 dB contours. Disclosure of noise impacts outside the DNL 65 dB contour may also be warranted in connection with the consideration of noise impacts in areas where the land use compatibility guidelines in 14 CFR part 150 may not be relevant. See FAA Order 1050.1F, Appendix B, paragraph B-1.4.

<sup>37</sup> See FAA Order 1050.1F, Appendix B, paragraph B-1.3; FAA Order 7400.2K, section 32-2-1.b.2.

<sup>38</sup> For NEPA reviews, GHG emissions should be quantified when fuel burn is computed and reported in the NEPA document. See Section 3 of this Desk reference.

## 4.2 Aircraft operations and schedules

Aircraft operations are the flight schedule information input to AEDT to compute aircraft performance and affect environmental results. Inputs include fleet mix (i.e., airframe, engine), number of operations, and operational profile (i.e. the distribution of operations over time).

Aircraft operations inputs to compute noise, an emissions inventory, emissions dispersion, fuel burn, or GHG emissions may include:

- Number of operations by aircraft type in the year(s) of study;
- Fleet mix, specifying each airframe and engine, based on annual operations;
- Aircraft flight paths;
- Aircraft ground movements, represented in time and space, for emissions;
- Airport layout and capacity parameters;
- Number of day and night operations by aircraft for the Day-Night Average Sound Level (DNL) noise metric. For the Community Noise Equivalent Level (CNEL) noise metric only, also include the number of evening operations by aircraft; and
- Operational profile(s) (i.e., number of flights in the month, day, and hour or quarter-hour relative to the peak). AEDT will run the operational profiles for emissions dispersion. Information must be provided on the split between day, evening, and night operations, as appropriate for the noise metric.

As an alternative to the aircraft operations information listed above, a detailed schedule of annual operations (i.e., time-stamped flights for the year of study, which includes the fleet and operations for the entire year) may be provided. AEDT will run the detailed schedule for emissions inventory and emissions dispersion, and annualize the data to an average annual day for noise.

For an emissions dispersion analysis, AEDT's ground delay and sequencing function should be used, which models aircraft ground locations in time and space based on airport layout and capacity parameters.

If delay and sequencing is applied to the aircraft operations in a noise metric result, the scheduled and actual time for each operation should be compared to determine whether there is a change. Coordinate with the AEE-100 if there are differences between scheduled and actual times for noise operations that occur across the day and night time periods for the DNL metric or day, evening, and night time periods for the CNEL metric.

For emissions only, non-aircraft operations inputs may include:

- Auxiliary power units;
- Ground support equipment, e.g., aircraft tugs, air start units, loaders, tractors, fuel or hydrant trucks;
- Stationary sources, e.g., boilers, heaters, generators, snowmelters, incinerators, fire training facilities, fuel storage tanks, painting operations, de-icing and anti-icing operations, salt/sand storage.

### 4.3 Use of weather information

This section describes the use of weather data and atmospheric absorption.

#### 4.3.1 Weather data

AEDT default weather data include average annual weather (i.e., based on 30-year normals and 10-year averages) for each airport,<sup>39</sup> as well as International Standard Atmosphere (ISA) conditions.<sup>40</sup> In addition, AEDT accepts more detailed weather data (in space and/or time). Default or more detailed weather for each airport may be selected, depending on the type of analysis.

For airport actions, AEDT default airport-specific average weather conditions should be used to compute noise for the airport to be studied. Use of non-default weather data requires written approval from AEE (see Section 5, Non-Default Methods and Data).

For air traffic airspace and procedure actions, AEDT default airport-specific average weather conditions for the airport(s) to be studied should be used to compute noise. Use of non-default weather data requires written approval from AEE (see section 5).

When emissions dispersion analysis is conducted, surface and upper air weather data must be used to compute both the emissions inventory and emissions dispersion analyses. There is no singular, standard weather data source for emissions inventory or dispersion computation. The weather data needed to compute emissions dispersion must meet EPA guidance<sup>41</sup> and the AERMOD format. Use of AERMET to form compliant weather input for AERMOD allows use of data sets from the NWS, on-site data, or detailed one-minute data. For example, NCDC ASOS/Upper Air format meets the requirements to compute emissions dispersion. Conduct interagency coordination to determine the appropriate weather data to use for the analysis of emissions dispersion.

The same weather source used to compute the emissions inventory of criteria pollutants should be used to compute fuel burn and CO<sub>2</sub> emissions.

In this use case, there could be differences between the source of weather data applied (i.e. for noise and emissions) where appropriate. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of weather and its potential influence in a specific study.

#### 4.3.2 Atmospheric absorption [noise only]

Atmospheric absorption is the calculation of the absorption of sound by the atmosphere due to weather conditions (temperature, relative humidity, atmospheric pressure, etc.). In AEDT 2b, the airport average weather conditions in the study are used to calculate atmospheric absorption adjustments to standard Noise-Power-Distance (NPD) curves.

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<sup>39</sup> Data acquired from NOAA National Climatic Data Center: <http://www.ncdc.noaa.gov/oa/ncdc.html>.

<sup>40</sup> The International Standard Atmosphere is an atmospheric model of how the pressure, temperature, density, and viscosity of the Earth's atmosphere change over a wide range of altitudes.

<sup>41</sup> US EPA, "Meteorological Monitoring Guidance for Regulatory Modeling Applications," EPA-454/R-99-005, February 2000. <http://www.epa.gov/ttn/scram/guidance/met/mmgrma.pdf>.



For noise analyses of FAA actions, the atmospheric absorption type “*SAE-ARP-5534*” must be selected in AEDT Processing Options. This function uses the method described in Society of Automotive Engineers’ (SAE) Aerospace Recommended Practice (ARP) 5534, taking into account changes in atmospheric absorption due to airport specific temperature, relative humidity, and atmospheric pressure.

## **4.4 Flight paths**

### **4.4.1 Ground track geometry**

Aircraft operations are modeled on ground tracks. AEDT 2b allows for the development of studies with ground track geometry that include both straight and curved flight paths. For analyses that include emissions inventory, emissions dispersion, and noise, modeled ground tracks should approximate actual flight paths in the study area. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of ground tracks.

### **4.4.2 Track dispersion**

Ground tracks are typically consolidated, or “bundled,” to represent average movements around an airport in an analysis. The potential effects that the modeling technique of bundling ground tracks may have on study results should be considered, as there are different implications on noise, fuel burn, and emissions results. Specifically, care should be taken to ensure that bundled ground tracks and the aircraft types that are modeled on those tracks represent actual operations in the study area in terms of flight path dispersion around the airport and the aircraft types that fly those flight paths.

## **4.5 Use of terrain information**

AEDT 2b allows users to import terrain files and use terrain data in emissions dispersion and noise computations. When terrain is not applied in AEDT 2b, the model computes receptor-to-source distances in the noise and emissions dispersion calculations based on flat ground.

In regions where topography is relatively flat, use of terrain is not required for environmental studies. If there is uncertainty in the use of terrain and its potential influence on pollutant concentrations or noise exposure in a specific study, coordinate with the appropriate reviewing authority. If terrain files are used in a study that includes both emissions dispersion and noise, then the same terrain data should be applied for relevant noise and emissions dispersion metrics.

For noise analyses, terrain files can be applied with or without line-of-sight blockage. Although line-of-sight blockage is not required for environmental studies, it should be considered for analyses that have substantial terrain features located between the aircraft noise sources and the noise receptors. Coordinate with the appropriate FAA office if there is uncertainty regarding the use of line-of-sight blockage and its potential influence on noise exposure in a specific study.

#### **4.6 Use of lateral attenuation for propeller aircraft and helicopters [noise only]**

For noise analyses, lateral attenuation describes the difference in sound level between the sound directly under an aircraft's flight path and at a location to the side of the aircraft. In AEDT 2b, the lateral attenuation adjustment is based on the methods described in the SAE Aerospace Information Report (AIR) 5662 "Method for Predicting Lateral Attenuation of Airplane Noise." It takes into account the following effects on aircraft sound due to over-ground propagation: (1) ground reflection effects; (2) atmospheric refraction effects; and (3) airplane shielding effects, as well as other ground and engine/aircraft installation effects.

AEDT 2b assumes that sound propagation occurs over acoustically soft ground (i.e. grass/trees), which is appropriate for the majority of analyses. AEDT 2b also has a setting to turn off lateral attenuation for flights from helicopters and propeller-driven airplanes, effectively assuming propagation over acoustically hard ground (i.e., pavement/water), while soft ground effects would still apply to other aircraft types.<sup>42</sup>

For noise analyses of FAA actions, lateral attenuation must be modeled for all aircraft types, including helicopters and propeller-driven airplanes, assuming acoustically soft ground (ensure that the box "*Use hard ground attenuation for helicopters and propeller aircraft*" is unchecked in AEDT Processing Options). Written approval from AEE-100 is required if the default lateral attenuation setting is not used. See section 5 on Non Default Methods and Data for information on request and approval processes.

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<sup>42</sup> Sometimes lateral attenuation is not used when source-to-receiver propagation occurs primarily over an acoustically hard surface (e.g., water), the hard surface dominates the study environment, and there are low-altitude helicopter and propeller-driven aircraft operations.

## 5 Non-Default Methods and Data

Use of non-default methods or data<sup>43</sup> for environmental analysis<sup>44</sup> of FAA actions generally requires written approval from AEE. Section 5.1 describes the procedures for coordinating AEE review. Section 5.2 lists specific items that do or do not require AEE review and approval. Section 5.3 describes information required to be submitted for each type of non-default method or data.

The approval for use of non-default methods or data is limited to the particular study under consideration. The approval of particular non-default methods or data in past studies does not guarantee approval in a future study. Each modeling situation is unique and must be evaluated on a case-by-case basis. Approval should be sought prior to the start of modeling.<sup>45</sup>

### 5.1 Procedures for AEE review of non-default methods and data

Below is a description of the required steps in AEE review and approval to use non-default methods and data.

1. Initial communication between project consultant (PC), in coordination with the project sponsor (PS), and FAA project manager (PM) in the region, district office, or service center to determine if the proposed non-default methods/data require formal review by AEE. As part of this discussion, the PC should be prepared to explain the reason for the use of non-default methods/data to the PM and AEE.
2. The PC must then submit the review package (see section 5.3) to the appropriate FAA headquarters office, in coordination with the PS and PM. Information in the review package must be complete and presented in a clear manner. The information and the review process should be well-documented and may be included as an appendix to an EA, EIS, or study report as part of the NEPA documentation. The format of the review package is described in section 5.3.
3. After receiving the review package and checking it for completeness, the appropriate FAA headquarters office will forward the review package to AEE.
4. Provided the review package is complete and contains all essential information (see section 5.3), AEE will begin their review of the package. During the review period, AEE may discuss the review package, gather more facts, and clarify the technical issues directly with the PC. Unless policy implications or substantive issues arise, AEE does not need to coordinate with other FAA headquarters offices, or the PM during this period other than providing emails on the status of its review, as appropriate.

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<sup>43</sup> Non-default methods or data are methods or data that are not set as default or are not inherent within the tool (i.e., AEDT for aircraft performance, noise, fuel burn, or emissions computation such as user-defined aircraft or flight profiles, new analytical techniques, or alternative models or methods).

<sup>44</sup> Guidance on coordination for Part 150 and Part 161 studies can be found in the Memorandum for AEE and Airports Coordination Policy for Non-Standard Modelling Procedures and Methodology, June 28, 2009.

<sup>45</sup> Preliminary analysis may be conducted to assess the need for non-default methods or data, or to include in the review package, however, approval should be sought before starting detailed modeling for NEPA reviews.

5. AEE will prepare a letter addressed to the PM providing the decision on the review package.
6. AEE will forward the decision letter to the PM with a cc: to the appropriate FAA headquarters office by email. The PM should convey the decision to the PS and PC.
7. If AEE approves the use of non-default methods or data, the following must be included in the FAA's project file: (1) a copy of AEE's approval letter; and (2) a description of the approved non-default method(s) and/or data.

Questions about the above procedures should be addressed to the appropriate FAA headquarters office, whether the questions pertain to the process or as applied to a specific project. Early and clear communications with the PS and PC will reduce the chance of delay caused by an incomplete review package.

## **5.2 Lists of common analysis methods/data and whether AEE review and approval is required**

Sections 5.2.1 and 5.2.2 describe common analysis methods and data used to model aircraft performance, noise, fuel burn, emissions inventory and/or emissions dispersion. For information on how to request changes to methods or data not listed in either section, please contact AEE.

### **5.2.1 Analysis methods/data that *do not require* AEE review and approval**

The following analysis methods or data *do not* require AEE review and approval.

- Default methods and data that are provided in an AEDT installation or service package, including but not limited to aircraft in the fleet database, airports in the airports database, International Standard Atmosphere (ISA) and 30-year annual average airport weather<sup>46</sup> data.
- AEDT 2b's FAA-accepted methodology to create user-defined procedural profiles.
- Stage length determinations to guide the selection of standard profiles, if one of the following factors is used for those determinations:
  - Trip Length
  - Estimate of takeoff weights
  - Documented procedures based on ICAO Document 9911, SAE International Aerospace Information Report 1845, or ECAC Document 29 standards

While AEE approval is not required, documentation of the selection and reasoning behind the stage length determination must be included in the project's NEPA documentation.

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<sup>46</sup> See the weather section in each use case of this guidance for more information.

- Use of supplemental (i.e., other than DNL) A-weighted noise metrics that are described for possible use in this Desk Reference or the *Environmental Desk Reference for Airport Actions*, provided that the study only reports the resulting noise levels and does not draw any specific conclusions about impacts or suggest that the impacts are significant. Conversely, the discussion must include effective language about existing scientific uncertainties and the lack of FAA assessment methodology, impact criteria, and policy guidance in the area examined by supplemental metrics.
- Use of the First Order Approximation Version 3.0a (FOA3a) to calculate particulate matter emissions from aircraft.

Although the above methods/data do not require approval, they should be well documented in the NEPA documentation.

### 5.2.2 Analysis methods/data that *require* AEE review and approval

The following analysis methods or data require AEE review and approval.

- Sensitivity
  - Any supplemental noise analysis that involves impacts that are likely to be highly controversial on environmental grounds.<sup>47</sup>
  - Any supplemental noise analysis that involves Section 4(f) properties (including, but not limited to, noise-sensitive areas within national parks; national wildlife and waterfowl refuges; and historic sites including traditional cultural properties) where a quiet setting is a generally recognized purpose and attribute.
- Supplemental noise metrics
  - A-weighted noise metrics that are not listed in this Desk Reference or the *Environmental Desk Reference for Airport Actions*.
  - Interpretation of impacts or significance for supplemental A-weighted noise metrics that are listed in this Desk Reference or the *Environmental Desk Reference for Airport Actions*.
  - Supplemental noise analysis that is focused on one or more secondary or indirect effects (e.g., sleep disturbance, health effects, classroom learning, low frequency impacts), regardless of the supplemental metric(s) used.
  - Any noise metrics that are not A-weighted (e.g., Time Audible and frequency-based metrics, C-weighted metrics, etc.).

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<sup>47</sup> The impacts of an action are considered “highly controversial on environmental grounds” when reasonable disagreement exists over the project’s risks of causing environmental harm. Mere opposition to a project is not sufficient to be considered highly controversial on environmental grounds. Opposition on environmental grounds by a Federal, state, or local government agency or by a tribe or a substantial number of the persons affected by the action should be considered in determining whether or not reasonable disagreement regarding the impacts of a proposed action exists. If in doubt about whether a proposed action is highly controversial on environmental grounds, consult the LOB/SO’s headquarters environmental division, AEE, Regional Counsel, or AGC for assistance. See FAA Order 1050.1F, paragraph 5-2.b.(10).

- Aircraft profiles and model mappings
  - Aircraft that do not exist in AEDT default data.
  - Aircraft where model mappings (performance, noise, or engine emissions) are changed.
  - User-defined aircraft profiles (including modifications to standard profiles) developed by methods other than AEDT 2b's FAA-accepted methodology.
  - Helicopter operations that do not follow AEDT-defined profiles and parameters.
  - Radar-based or other methods not listed in section 5.2.1 for adjusting stage lengths.
- Non-default weather data used for the analysis of noise. See the weather section in each use case of this guidance for more information.
- Use of a method other than the First Order Approximation Version 3.0a (FOA3a) to calculate particulate matter emissions from aircraft.
- Non-default emissions area source grid size.
- Alternative models and methodologies besides FAA-required and -preferred models and methodologies (e.g., terrain shielding, adjustments to lateral attenuation, etc.), including modifications to AEDT default methodologies.

### 5.3 Information to include in requests to use non-default methods/data

The following information is always required for any request to use non-default methods or data:

1. *Background.* Briefly describe the project, including location, for which non-default methods or data are needed. State the type of analysis (e.g., Environmental Assessment (EA), Environmental Impact Statement (EIS), or other type of NEPA analysis). Include any additional relevant information.
2. *Statement of Benefit.* Briefly describe why the non-default methods or data are needed for this project, how the non-default methods or data are more appropriate, and why the default method or data are not sufficient.

The sections below discuss the *additional* specific information required to be submitted for specific types of non-default methods or data.

#### 5.3.1 User-defined aircraft and aircraft mappings

The default aircraft mappings provided in AEDT 2b are recommended by the FAA for use in NEPA analyses of FAA actions. However, AEDT 2b allows for the creation of user-defined aircraft and to specify aircraft mappings that differ from default data provided in AEDT 2b. If modelers use aircraft or aircraft mappings that are not part of AEDT 2b for noise analyses, AEE approval is required (see section 5.2.2).

Additional information to include in a submittal package requesting AEE approval for use of user-defined aircraft or aircraft mappings:

1. *Aircraft Information.* If requesting use of a new aircraft, submit an AEDT Data Submittal Form.<sup>48</sup> If requesting use of a different aircraft mapping, provide the following information in table form for both the original aircraft and the mapping aircraft.

- Manufacturer Type
- Type Designation
- Maximum Take-off Weight (MTOW) (lb)
- Maximum Landing Weight (MLW) (lb)
- Engine static thrust
- Engine Manufacturer /Type Designation
- Certification Noise: Fly Over, Lateral, and Approach
- Engine emissions indices (optional)<sup>49</sup>
- Fuel consumption coefficients
- Percentage of operation (optional)

For user-defined helicopters, also include:

- Number of main rotor blades
- Main rotor diameter (ft)
- Rotor speed (RPM)
- Number of rotors (main plus tail)
- Maximum speed in level flight with maximum continuous power, VH (kt)
- Never Exceed Speed, VNE (kt)
- Does the helicopter have wheels (Yes/No)?

An example table is provided for reference:

User-Defined Aircraft	"Mapped" Aircraft in AEDT	Manufacturer	Type Designation	MTOW (lb)	MLW (lb)	Engine Static Thrust	Engine Manufacturer / Type Designation	Noise Level (EPN dB)			Engine Emissions Index	Fuel Burn Coefficient	% Operations
								Fly Over	Lateral	Approach			

### 5.3.2 User-defined profiles

AEDT 2b provides standard profiles that are appropriate for most studies. In certain situations, where a more detailed profile is needed and procedural profiles are provided as input, AEDT 2b has an FAA-accepted methodology to create user-defined profiles. AEDT 2b calculates flight paths for civilian jet, turboprop, and piston aircraft within the limits of a given aircraft’s performance characteristics and based on altitude controls set by the modeler. If modelers use AEDT 2b to develop profiles, then AEE approval is not required (see section 5.2.1). If standard profiles and AEDT 2b cannot provide the profiles needed for the study, then approval from AEE to develop user-defined profiles (or custom stage lengths) based on a different method (see section 5.2.2) must be requested.

<sup>48</sup> To obtain the AEDT Data Submittal form for aircraft noise and performance, contact AEDT Support at [aedt-support@dot.gov](mailto:aedt-support@dot.gov).

<sup>49</sup> An emissions index (or emissions factor) is a representative value that relates the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Generally, emissions indices are expressed as pounds of pollutant per 1,000 pounds of fuel consumed.

Additional information to include in a submittal package requesting AEE approval for user-defined profiles (non-AEDT method):

1. *Analysis Demonstrating Change*

For departure tracks, provide Sound Exposure Level (SEL) values for a noise receptor network spaced 0.5 nautical miles apart underneath the flight path, beginning at the start of takeoff roll and ending at the end of the profile, or at 10 nautical miles from the start of takeoff roll (whichever is shorter). For arrival tracks, place the noise receptors 0.5 nautical miles apart underneath the flight path, beginning at the start of the profile, or at 10 nautical miles away from the runway threshold (whichever is shorter), and ending at the last point of the landing roll-out on the runway. Also include noise receptors for any noise sensitive areas.

Fuel burn, emissions, and emissions dispersion results are not needed in the submittal package because differences in these results from an individual user-defined profile (compared to standard profiles) are considered to be insignificant in comparison with the total fuel burn, emissions inventories, and pollutant concentrations up to the mixing height resulting from all aircraft activity in a given study.

Interpret the results of the analysis and explain how the results correlate with the “Statement of Benefit”. For each profile, provide a table with the following information. Submit with the AEDT Administrative File, which includes study information used to perform the above analysis.

AEDT Aircraft Model \_\_\_\_\_ Profile Weight \_\_\_\_\_

	AEDT Default Profile	User-Defined Profile	Difference
Noise Receptors (nmi) 0.5 1.0 1.5 2.0 ... 10.0	(SEL dB)	(SEL dB)	(dB)
Noise Sensitive Areas $x_1, y_1$ $x_2, y_2$ ... $x_n, y_n$	(SEL dB)	(SEL dB)	(dB)



2. *Concurrence on Aircraft Performance.* In this section, obtain verification from an airline operator or aircraft manufacturer familiar with the performance characteristics of the aircraft. This verification could be either:
  - a. A description of the performance characteristics of the aircraft, such as a profile description copied from a flight manual. Define all abbreviations and terms used on the copied material. Or,
  - b. A statement by the operator or manufacturer certifying that the proposed profile falls within reasonable bounds of the aircraft's performance for the modeled airport location.
3. *Performance Characteristics.* State that the aircraft performance characteristics submitted by the operator or manufacturer have been correctly translated into the AEDT formatted profile or procedure. Specifically, certify that:

If the new profiles are in terms of profile points:

- a. Altitude is AFE in feet.
- b. Speed is true airspeed in knots.
- c. State the units of thrust-setting (for example, pounds). State that the units match the units of the thrust-setting parameter used in the aircraft's associated noise-power-distance curves.

If the new profiles are defined in terms of procedure steps:

- a. If new aircraft performance coefficient data were developed, separate AEE review is required. In addition, direct manufacturer support or flight test information is required to facilitate that review.
- b. The procedure step data must conform to the profile rules given in the AEDT 2b ASIF Reference Guide.
- c. If percent units are used for thrust-setting, give the value of the aircraft's static thrust parameter used in the denominator when calculating percent. State that this value is in units of pounds.
- d. If the profile thrust setting is in terms of Revolutions per Minute (RPM), Exhaust Pressure Ratio (EPR), N1 or other parameters, show the method for converting thrust to pounds.

4. *Graphical and Tabular Comparison.* Provide three graphics for each proposed change in profile in each seat class:
  - a. Altitude vs. Distance
  - b. Speed vs. Distance
  - c. Thrust vs. Distance

Plot the default profiles and the proposed user-defined profiles on the same graph. Also, submit tables of information used to plot the graphs. Quantitative comparison, such as an estimate of the least mean square of differences, should be provided and explained.