

5.5 AIR QUALITY

The operation of an airport causes emissions of Federally regulated air pollutants whose levels may be affected by improvement projects. The Federal Aviation Administration (FAA) must carefully consider the air quality impacts resulting from an airport development project by conducting an air quality assessment to ensure a project's compliance to established environmental regulations and directives.

This Environmental Impact Statement (EIS) has been prepared to evaluate the potential impacts associated with the implementation of proposed air traffic noise abatement alternatives from the 1999 Noise Compatibility Program (NCP) Update.¹ Also included in the project is the implementation of the FAA's proposed increase in the number of jet aircraft departing T.F. Green Airport for the Baltimore-Washington Airport (BWI), using the east coast Severe Weather Alternative Procedure (SWAP) route. While both of these alternatives are air traffic control actions, the proposed NCP measures are changes to flight tracks/corridors that were developed to mitigate noise impacts around the airport's perimeter. The NCP measures affect departure aircraft from the surface to 18,000 feet above ground level (AGL).²

This section presents an assessment of the potential impacts to the quality of the air at T.F. Green Airport and its environs due to the Proposed Action and its alternatives under consideration in this EIS. The impacts were assessed in accordance with the FAA's *Air Quality Procedures for Civilian Airports & Air Force Bases* and FAA Order 1050.1D, *Airport Environmental Handbook*, as directed by FAA Order 1050.1D, *Policies and Procedures for Considering Environmental Impacts*. It should be noted that Order 1050.1D Change 4 specifically exempts air traffic procedures changes from the requirements of the General Conformity Rule; however, an assessment was completed to determine any impacts. Refer to Appendix E, *Air Quality*, for background information regarding the T.F. Green air quality assessment. Refer to Attachment 1 of Appendix E, *Coordination Documentation*, for copies of air quality agency coordination documentation.

Key Findings

- *Attainment Status:* T.F. Green Airport is located within Kent County, Rhode Island, which has been designated by the U.S. Environmental Protection Agency (EPA) as a serious nonattainment area for the 1-hour concentration of ozone (O₃).

¹ Refer to Chapter Three, *Alternatives*, Paragraph 3.2.4, *The Proposed Action*, of this EIS for a full description of the recommended NCP noise abatement measures.

² Refer to Chapter One, *Background*, Paragraph 1.0, *Introduction*, and Section 5.1, *Noise*, Paragraph 5.1.12, *Noise Considerations of Aircraft Over 3,000 AGL*, of this EIS.

- *Impact to Emissions Sources:* The proposed project would not result in any direct emissions or in any “reasonably foreseeable” indirect emissions.³ Neither would implementation of the project change the airport’s net emissions (the difference between total emissions under the 2003 baseline conditions and total emissions under 2003 “with-project” conditions).
- *General Conformity:* A General Conformity determination is not required for the proposed project because changes in air traffic control procedures that would not significantly change or increase the airport’s net emissions is considered an exempt action under 40 CFR 93.153(c) and the preamble to the General Conformity Rule as published in Volume 58 of the Federal Register (58 FR 63229). This assessment, however, was completed for this study.

5.5.1 Regulatory Setting

The Clean Air Act Amendments of 1990 (CAAA) and the National Environmental Policy Act (NEPA) provided for the establishment of Federal and state regulatory strategies to achieve and maintain an acceptable standard of air quality in the United States. Therefore, the EPA established a set of standards for six pollutants known as the National Ambient Air Quality Standards (NAAQS). In addition, individual states establish standards similar to and at least as strict as the national standards.⁴

The U.S. Environmental Protection Agency uses six "criteria pollutants" as indicators of air quality:

- Ozone (O₃)
- Carbon Monoxide (CO)
- Nitrogen Dioxide (NO₂)
- Particulate Matter (PM₁₀)
- Sulfur Dioxide (SO₂)
- Lead (Pb)

For each of these pollutants, Rhode Island and the USEPA established "primary" standards to protect public health, and "secondary" standards to protect other aspects of public welfare, such as preventing materials damage, preventing crop and vegetation damage, or assuring visibility. These standards are called Ambient Air Quality Standards (AAQS). A state's own standards

³ *Direct* emissions are those caused by or initiated by the implementation and/or operation of an action, and that occur at the same time and place as the action. *Reasonably-foreseeable* emissions are those which the FAA could practicably control and will maintain control over due to a continuing program responsibility of the FAA. Indirect *emissions* are those caused by the implementation and/or operation of an action, are “reasonably foreseeable, but which occur later in time and/or are farther removed in distance from the action itself. FAA and USAF. April 1997. *Air Quality Procedures for Civilian Airports & Air Force Bases*.

⁴ “Ambient air” is generally defined as that portion of the atmosphere, external to buildings, to which the general public has access. The air that is within the fenced in or guarded area of facility property is not ambient.

may be more restrictive than the Federal standards, but never less strict. Areas of the country where air pollution levels persistently exceed these standards may be designated "nonattainment." Rhode Island has adopted standards identical to the Federal standards. The established Rhode Island and National AAQS (NAAQS) are presented in **Table 5.5-1, Ambient Air Quality Standards**.

Ozone

Ozone is not emitted directly by any source but rather is created by the photochemical reaction of sunlight, nitrogen dioxide, and volatile organic compounds (VOCs). Volatile organic compounds are hydrocarbons (HCs) created when fuels are burned. Neither VOCs nor HCs are a criteria pollutant and therefore, no ambient air standards have been established for them. Unless otherwise specified by the USEPA, most HCs are presumed to be VOCs in the regulatory context.⁵ Therefore, for the purpose of an air quality analysis, the levels of ozone would be assessed through the examination of the levels of NO_x (Nitrous Oxides) and HCs.

Lead

Airborne lead in urban areas is primarily emitted by vehicles using leaded fuels. The chief source of lead emissions at airports would be the combustion of leaded aviation gasoline in general aviation piston-engine aircraft. Generally, general aviation services at airports dispense unleaded aviation gasoline. Therefore, lead is rarely included in an airport's air quality analysis.

5.5.2 Providence Air Quality Status

The cities of Providence, Warwick, and the airport are located in Kent County, which has been designated as a serious nonattainment area for the 1-hour concentration of ozone (O₃). The monitoring and control of the air quality in Providence is the responsibility of the Rhode Island Department of Environmental Management (DEM), Office of Air Resources, located in Providence, Rhode Island. Local air quality modeling and planning is the responsibility of both the DEM and the Rhode Island Statewide Planning Program, the local Metropolitan Planning Organization (MPO).

5.5.3 State Implementation Plan

According to provisions of the Clean Air Act, each state must provide the USEPA with a State Implementation Plan (SIP) to define what actions a state will take to improve the air quality in areas that do not meet established ambient air quality standards.

The Clean Air Act stipulates that the SIP include a comprehensive inventory of existing sources of air pollution and an accurate estimate of the amount of pollutants emitted by each source. The USEPA's Office of Air Quality Planning and Standards (OAQPS), and the states, need this emissions inventory to evaluate the effects on air quality of planned new sources of pollution and to satisfy other analysis and reporting requirements of the Clean Air Act. In addition, an area

⁵ FAA and USAF. 1997. *Air Quality Procedures for Civilian Airports & Air Force Bases*. Washington, D.C.: Office of Environment and Energy, AEE-120.

designated by USEPA to be nonattainment for any of the criteria pollutants must include in the SIP a plan to bring the area back into attainment. To this end, proposed airport improvement projects must show compliance to the air emissions regulations found in the SIP. Rhode Island's SIP is contained in the Rhode Island Department of Environmental Management's Air Pollution Control Regulations. To determine compliance to the SIP, an air quality assessment usually includes an evaluation of the impact due to an airport's proposed project.

5.5.4 Emissions Impact

Impact to air quality as a result of an airport improvement project is typically evaluated by conducting an emissions inventory. A complete inventory of emissions is determined under future baseline conditions and also under "with project" conditions for the same future year. The net change in emissions is then determined by calculating the difference between these two values for each criteria pollutant. An emissions inventory calculates the air emissions in tons per year from mobile and stationary sources on the ground and those in the air up to 3,000 feet AGL, which is the approximate depth of the atmospheric mixing layer. The NCP measures proposed for T.F. Green Airport affect departure aircraft from the surface and up to 18,000 feet above ground level (AGL).⁶ Therefore, the proposed NCP measures would not affect ground based emissions. Ground based emissions are those resulting from takeoff and landing roll of aircraft.

Since the proposed project for T.F. Green Airport involves only changes to the air traffic control procedures for aircraft from the surface to 18,000 feet, there would be no additional direct emissions or reasonably foreseeable indirect emissions resulting from implementation of the Proposed Action. Therefore, the nature of the project proposed for T.F. Green Airport is such that its implementation would not create or cause:

- new emissions sources, stationary or mobile (including construction)
- changes or increases in the operation of stationary sources
- changes or increases in the number of motor vehicles on- or off-airport
- changes or modifications to any roadway or interstate highway
- changes or increases in the time that aircraft operate on the ground
- changes or increases in the time that aircraft operate during approach or climbout
- changes in runway utilization

For these reasons, an emissions inventory was not conducted for the T.F. Green Airport EIS air quality assessment.

⁶ Refer to Chapter One, *Background*, Paragraph 1.0, *Introduction*, and Section 5.1, *Noise*, Paragraph 5.1.12, *Noise Considerations of Aircraft Over 3,000 AGL*, of this EIS.

**Table 5.5-1
 AMBIENT AIR QUALITY STANDARDS
 T.F. Green Airport**

CRITERIA POLLUTANT	AVERAGING PERIOD	NATIONAL AND RHODE ISLAND AMBIENT AIR QUALITY STANDARDS	
		PRIMARY ^{1/}	SECONDARY ^{2/}
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean ^{a/}	0.03 ppm	N/A
	24-Hour Average	0.14 ppm	N/A
	3-Hour Average	N/A	0.5 ppm
Particulate Matter (PM ₁₀) ^{3/}	Annual Arithmetic Mean	50 µg/m ³	Same as Primary
	24-Hour Average ^{b/}	150 µg/m ³	
Particulate Matter (PM _{2.5}) ^{4/}	Annual Arithmetic Mean	15 µg/m ³	N/A
	24-Hour Average ^{b/}	65 µg/m ³	N/A
Carbon Monoxide (CO)	8-Hour Average	9 ppm	N/A
	1-Hour Average	35 ppm	N/A
Ozone (O ₃)	1-Hour Average ^{c/}	0.12 ppm	Same as Primary
	8-Hour Average	0.08 ppm ^{5/}	
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.053 ppm	Same as Primary
Lead (Pb)	3-Month Arithmetic Mean ^{d/}	1.5 µg/m ³	Same as Primary

Table 5.5-1, Continued
AMBIENT AIR QUALITY STANDARDS
T.F. Green Airport

- ^{1/} Primary Standards express the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing for a margin of safety to protect sensitive members of the population.
- ^{2/} Secondary Standards express the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impact to the environment.
- ^{3/} Inhalable particles with an aerodynamic diameter of 10 microns or less.
- ^{4/} New Standard remanded (and vacated) to the EPA for further consideration, by the U.S. Court of Appeals. May 14, 1999.
- ^{5/} New Standard remanded (not vacated) to the EPA for further consideration, by the U.S. Court of Appeals. May 14, 1999.

Notes: ppm = parts per million.
μg/m³ = Micrograms per cubic meter. A microgram (μg) is equal to one-millionth of a gram, or 10⁻⁶ gram.
N/A = Not Applicable

- a/ Annual Arithmetic Mean standards are never to be exceeded. Shorter-term standards not to be exceeded more than once per year unless noted.
- b/ Standard attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than one.
- c/ Standard attained when expected number of days per calendar year with maximum hourly average concentration above 0.12 ppm is equal to or less than one.
- d/ Never to be exceeded.

Source: 40 CFR Part 50 Section 50.4 through 50.12. NAAQS.
Rhode Island Dept. of Environmental Management, Office of Air Resources. March 1993. *Air Pollution Control Regulation No. 9 ¾ Air Pollution Permits*.
FAA and USAF. 1997. *Air Quality Procedures for Civilian Airports & Air Force Bases*.
United States Court of Appeals for the District of Columbia Circuit. May 14, 1999. *American Trucking Associations, Inc., et. al. Vs United States EPA, et. al.* 1999 U.S. App. LEXIS 9064.

5.5.5 Conclusion

Although T.F. Green Airport is included inside an area designated as serious nonattainment for ozone, the nature of the Proposed Action for T.F. Green Airport has been found to result in no direct or reasonably foreseeable indirect emissions. Actions that do not cause an increase in emissions are recognized by Federal agencies as clearly *de minimis* and are considered exempt and presumed to conform.⁷

The USEPA provides a list of actions that are considered exempt and presumed to conform in the preamble to the General Conformity Rule, which was published in Federal Register Volume 58 (58 FR 63229) on November 30, 1993. The preamble lists "Air traffic control activities and adopting approach, departure and enroute procedures for air operations" as illustrative of a *de minimis* action.

Therefore, the Proposed Action for T.F. Green Airport, which consists entirely of changes to air traffic control procedures, would be exempt from General Conformity and no further analysis is required. Any associated mitigation measures such as sound insulation or home acquisitions, construction of noise berms or other actions related to the Proposed Action would not have a direct affect on the air quality conformity for T.F. Green Airport.

⁷ 40 CFR 93.153(c) — *Applicability*.