Federal Register

Friday,
August 28, 2009

Part V

Environmental Protection Agency

40 CFR Part 449

Effluent Limitation Guidelines and New Source Performance Standards for the Airport Deicing Category; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 449

[EPA–HQ–OW–2004–0038 FRL–8948–2]

RIN 2040–AE69

Effluent Limitation Guidelines and New Source Performance Standards for the Airport Deicing Category

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing technology-based effluent limitation guidelines (ELGs) and new source performance standards (NSPS) under the Clean Water Act (CWA) for discharges from airport deicing operations. The requirements generally would apply to wastewater associated with the deicing of aircraft and airfield pavement at primary commercial airports. The ELGs would be incorporated into the NPDES permits issued by EPA, states or tribes. EPA expects compliance with this regulation to reduce the discharge of deicing-related pollutants by at least 44.6 million pounds per year. EPA estimates the annual cost of the rule would be $91.3 million.

DATES: Comments must be received on or before December 28, 2009. Under the Paperwork Reduction Act, comments on the information collection provisions must be received by the Office of Management and Budget on or before September 28, 2009.

ADDRESSES: Submit your comments, identified by Docket No. EPA–HQ–OW–2004–0038 by one of the following methods:

- *http:www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *E-mail: OW–Docket@epa.gov*, Attention Docket ID No. EPA–HQ–OW–2004–0038.
- *Mail:* Water Docket, U.S. Environmental Protection Agency, Mail Code: 4203M, 1200 Pennsylvania Ave., NW., Washington, DC 20460. Attention Docket ID No. EPA–HQ–OW–2004–0038. Please include a total of 3 copies. In addition, please mail a copy of your comments on the information collection provisions to the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), *Attn:* Desk Officer for EPA, 725 17th St., NW., Washington, DC 20503.
- *Hand Delivery:* Water Docket, EPA Docket Center, EPA West Building Room 3334, 1301 Constitution Ave., NW., Washington, DC, Attention Docket ID No. EPA–HQ–OW–2004–0038. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information by calling 202–566–2426.

Instructions: Direct your comments to Docket No EPA–HQ–OW–2004–0038. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through www.regulations.gov or e-mail. The www.regulations.gov Web site is an ''anonymous access'' system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

Docket: All documents in the docket are listed in the *http://www.regulations.gov* index. A detailed record index, organized by subject, is available on EPA's Web site at *http://epa.gov/guide/airport.* Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the Water Docket in the EPA Docket Center, EPA/DC, EPA West, Room 3334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is 202–566–1744, and the telephone number for the Water Docket is 202–566–2426.

FOR FURTHER INFORMATION CONTACT: Eric Strassler, Engineering and Analysis Division, *telephone:* 202–566–1026; *e-mail: strassler.eric@epa.gov* or Brian D'Amico, Engineering and Analysis Division, *telephone:* 202–566–1069; *e-mail: damico.brian@epa.gov*.

SUPPLEMENTARY INFORMATION:

Regulated Entities

Entities potentially regulated by this action include:

Category	Example of regulated entity	North American Industry Classification System Code
Industry	Primary airports with over 1,000 annual jet departures that conduct deicing operations.	481, 4881

This section is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. Other types of entities that do not meet the above criteria could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria listed in § 449.01 and the definitions in § 449.02 of the rule and detailed further in Section IV of this preamble. If you still have questions regarding the applicability of this action to a particular entity, consult one of the persons listed for technical information in the preceding **FOR FURTHER INFORMATION CONTACT** section.

How To Submit Comments

The public may submit comments in written or electronic form. (*See* the **ADDRESSES** section above.) Electronic comments must be identified by the docket no. EPA–HQ–OW–2004–0038 and must be submitted as a WordPerfect, MS Word or ASCII text file, avoiding the use of special characters and any form of encryption. EPA requests that any graphics included in electronic comments also be provided in hard-copy form. EPA also will accept comments and data on disks in the aforementioned file formats. Electronic comments received on this notice may be filed online at many Federal Depository Libraries. No confidential business information (CBI) should be sent by e-mail.

Supporting Documentation

The rule proposed today is supported by a number of documents including:

- Technical Development Document for Proposed Effluent Limitation Guidelines and Standards for the Airport Deicing Category (TDD), Document No. EPA–821–R–09–004;
- Economic Analysis for Proposed Effluent Limitation Guidelines and Standards for the Airport Deicing Category (EA), Document No. EPA–821–R–09–005;
- Environmental Impact and Benefit Assessment for Proposed Effluent Limitation Guidelines and Standards for the Airport Deicing Category (EIB), Document No. EPA–821–R–09–003.

These documents are available in the public record for this rule and on EPA's Web site at *http://epa.gov/guide/airport.* They are available in hard copy from the National Service Center for Environmental Publications (NSCEP), U.S. EPA/NSCEP, P.O. Box 42419, Cincinnati, Ohio 45242–2419, telephone 800–490–9198, *http://epa.gov/ncepihom.*

Overview

The preamble describes the terms, acronyms, and abbreviations used in this notice; the background documents that support these proposed regulations; the legal authority of these rules; a summary of the proposal; background information; and the technical and economic methodologies used by the Agency to develop these regulations. This preamble also solicits comment and data on specific areas of interest.

Table of Contents

I. Legal Authority

EPA is proposing this regulation under the authorities of sections 301, 304, 306, 308, 402 and 501 of the Clean Water Act (CWA), 33 U.S.C. 1311, 1314, 1316, 1318, 1342 and 1361 and pursuant to the Pollution Prevention Act of 1990, 42 U.S.C. 13101 *et seq.*

II. Purpose and Summary of Proposed Rule

Section 304(m) of the CWA, added by the Water Quality Act of 1987, requires EPA to establish schedules for (1) reviewing and revising existing effluent limitation guidelines and standards (''effluent guidelines'') and (2) promulgating new effluent guidelines. On September 2, 2004, EPA published an Effluent Guidelines Plan (69 FR 53705) that established schedules for developing new and revised effluent guidelines for several industry categories. One of the industries for which the Agency established a schedule was the Airport Deicing Category. Today EPA proposes to set national standards for control of wastewater discharges from deicing operations at airports. Deicing operations include removal of ice from aircraft, application of chemicals to prevent initial icing or further icing (anti-icing), and removal of (and preventing) ice from airfield pavement (runways, taxiways, aprons and ramps).

Commercial airports and air carriers conduct deicing operations as required by the Federal Aviation Administration (FAA). Airport discharges from deicing operations may affect water quality, including reductions in dissolved oxygen, fish kills, reduced organism abundance and species diversity, contamination of drinking water sources (both surface and groundwater), creation of noxious odors and discolored water in residential areas and parkland, and other effects.

The proposed effluent guidelines and standards address both the wastewater collection practices used by airports, and the treatment of those wastes. Airports within the scope of this proposed rule would be required to collect spent aircraft deicing fluid (ADF) and treat the associated wastewater. Additionally, airports performing airfield pavement deicing would be required to use non-urea-based deicers. The requirements would be implemented in CWA discharge permits.

III. Background

A. Clean Water Act

Congress passed the Federal Water Pollution Control Act Amendments of 1972, also known as the Clean Water Act (CWA), to ''restore and maintain the chemical, physical, and biological integrity of the nation's waters.'' (33 U.S.C. 1251(a)). The CWA establishes a comprehensive program for protecting our nation's waters. Among its core provisions, the CWA prohibits the discharge of pollutants from a point source to waters of the U.S. except as authorized under the CWA. Under section 402 of the CWA, EPA authorizes discharges by a National Pollutant Discharge Elimination System (NPDES) permit. The CWA also authorizes EPA to establish national technology-based effluent limitation guidelines and standards (effluent guidelines or ELGs) for discharges from different categories of point sources, such as industrial, commercial and public sources.

Congress recognized that regulating only those sources that discharge effluent directly into the nation's waters would not be sufficient to achieve the CWA's goals. Consequently, the CWA requires EPA to promulgate nationally applicable pretreatment standards that restrict pollutant discharges from facilities that discharge wastewater indirectly through sewers flowing to publicly owned treatment works (POTWs). *See* section 307(b) and (c), 33 U.S.C. 1317(b) and (c). National pretreatment standards are established for those pollutants in wastewater from indirect dischargers that may pass through, interfere with or are otherwise incompatible with POTW operations. Generally, pretreatment standards are designed to ensure that wastewaters from direct and indirect industrial dischargers are subject to similar levels of treatment. In addition, POTWs are required to implement local treatment limits applicable to their industrial indirect dischargers to satisfy any local requirements. *See* 40 CFR 403.5.

Direct dischargers must comply with effluent limitations in NPDES permits. Indirect dischargers, who discharge through POTWs, must comply with pretreatment standards. Technology-based effluent limitations in NPDES permits are derived from effluent limitation guidelines (CWA sections 301 and 304) and new source performance standards (sec. 306) promulgated by EPA, or based on best professional judgment where EPA has not promulgated an applicable effluent guideline or new source performance standard. Additional limitations based on water quality standards (sec. 303) may also be included in the permit in certain circumstances. The ELGs are established by regulation for categories of industrial dischargers and are based on the degree of control that can be achieved using various levels of pollution control technology.

EPA promulgates national effluent limitation guidelines and standards of performance for major industrial categories for three classes of pollutants: (1) Conventional pollutants (*i.e.,* total suspended solids, oil and grease, biochemical oxygen demand, fecal coliform, and pH); (2) toxic pollutants (*e.g.,* toxic metals such as chromium, lead, nickel, and zinc; toxic organic pollutants such as benzene, benzo-a-pyrene, phenol, and naphthalene); and (3) non-conventional pollutants (*e.g.,* ammonia-N, formaldehyde, and phosphorus).

B. NPDES Permits

Section 402 of the CWA requires permits for discharges of pollutants to waters of the United States. In most states, the permits are issued by a state agency that has been authorized by EPA. Currently 46 states and 1 U.S. territory are authorized to issue NPDES permits. In the other states and territories, EPA issues the permits.

Section 402(p) of the Act, added by the Water Quality Act of 1987 (Pub. L. 100–4, February 4, 1987), requires stormwater dischargers ''associated with industrial activity'' to be covered under an NPDES permit. In its initial stormwater permit regulations, called the ''Phase I'' stormwater regulations (55 FR 47990, November 16, 1990), EPA designated air transportation facilities, including both airlines and airports, which have vehicle maintenance shops (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or airport deicing operations as subject to NPDES stormwater permitting requirements. *See* 40 CFR 122.26(b)(14)(viii).

Airport stormwater discharges may be controlled under a general NPDES permit, which covers multiple facilities with similar types of operations and/or wastestreams, or by an individual permit. (An airport may have additional NPDES permits for non-stormwater discharges, such as from equipment repair and maintenance facilities. The following discussion pertains only to stormwater permits.)

1. General Permits

Currently most airport deicing discharges are covered by a general permit issued either by EPA or by an NPDES-authorized state agency. In most areas where EPA is the permit authority, the Multi-Sector General Permit (MSGP) covers airport deicing discharges (73 FR 56572, September 29, 2008). Many NPDES-authorized state agencies have issued general permits in their respective jurisdictions with requirements similar to the MSGP. An airport seeking coverage under a general permit submits a Notice of Intent (NOI) to the permit authority rather than a detailed permit application. By submitting an NOI, the permittee is agreeing to comply with the conditions in the published permit.

For airports, the major requirements of the MSGP are:

- Develop a stormwater pollution prevention plan (SWPPP), including a drainage area site map, documentation of measures used for management of runoff, an evaluation of runway and aircraft deicing operations, and implementation of a program to control or manage contaminated runoff, including consideration of various listed control practices;
- Implement deicing source reduction measures, including minimizing or eliminating the use of urea and glycol-based deicing chemicals; minimizing contamination of stormwater runoff from runway and aircraft deicing operations; evaluating whether over-application of deicing chemicals occurs; and consider use of various listed source control measures;
- For airports using over 100,000 gal. of glycol based deicing chemicals and/or 100 tons or more of urea annually, monitor discharges quarterly for the first four quarters of the permit cycle, for the following pollutants: biochemical oxygen demand (BOD_5), chemical oxygen demand (COD), ammonia and pH;
- If the average of the four monitoring values for any parameter exceeds its benchmark, implement additional control measures where feasible, and continue monitoring;
- Conduct an annual site inspection during the deicing season, and during periods of actual deicing operations if possible; and routine facility inspections at least monthly during the deicing season.

2. Individual Permits

Some EPA and state NPDES-permitting authorities have required certain airports to obtain individual permits. In these situations, an airport must submit a detailed application and the permit authority develops specific requirements for the facility.

Some individual permits contain specialized requirements for monitoring and/or best management practices. Some of these permits also contain numeric water quality-based effluent limitations (WQBELs). Information on water quality-based permitting is available on EPA's Web site at *http://cfpub.epa.gov/npdes/generalissues/watertechnology.cfm.*

C. Effluent Guidelines and Standards Program

Effluent guidelines and new source performance standards are technology-based regulations that are developed by EPA for a category of dischargers. These regulations are based on the performance of control and treatment technologies. The legislative history of CWA section 304(b), which is the heart of the effluent guidelines program, describes the need to press toward higher levels of control through research and development of new processes, modifications, replacement of obsolete plans and processes, and other improvements in technology, taking into account the cost of controls. Congress also directed that EPA not consider water quality impacts on individual water bodies as the guidelines are developed. *See* Statement of Senator Muskie (Oct. 4, 1972), reprinted in Legislative History of the Water Pollution Control Act Amendments of 1972, at 170. (U.S. Senate, Committee on Public Works, Serial No. 93–1, January 1973.)

There are four types of standards applicable to direct dischargers (dischargers to surface waters), and two standards applicable to indirect dischargers (discharges to publicly owned treatment works or POTWs).

1. Best Practicable Control Technology Currently Available (BPT)

Traditionally, EPA establishes BPT effluent limitations based on the average of the best performances of facilities within the industry, grouped to reflect various ages, sizes, processes, or other common characteristics. EPA may promulgate BPT effluent limits for conventional, toxic, and non-conventional pollutants. In specifying BPT, EPA looks at a number of factors. EPA first considers the cost of achieving effluent reductions in relation to the effluent reduction benefits. The Agency also considers the age of the equipment and facilities, the processes employed, engineering aspects of the control technologies, any required process changes, non-water quality environmental impacts (including energy requirements), and such other factors as the Administrator deems appropriate. *See* CWA sec. 304(b)(1)(B). If, however, existing performance is uniformly inadequate, EPA may establish limitations based on higher levels of control than currently in place in an industrial category when based on an Agency determination that the technology is available in another category or subcategory, and can be practically applied.

2. Best Conventional Pollutant Control Technology (BCT)

The 1977 amendments to the CWA required EPA to identify additional levels of effluent reduction for conventional pollutants associated with BCT technology for discharges from existing industrial point sources. In addition to other factors specified in section 304(b)(4)(B), the CWA requires that EPA establish BCT limitations after consideration of a two part ''cost-reasonableness'' test. EPA explained its methodology for the development of BCT limitations in July 1986 (51 FR 24974). Section 304(a)(4) designates the following as conventional pollutants: biochemical oxygen demand measured over five days (BOD_5), total suspended solids (TSS), fecal coliform, pH, and any additional pollutants defined by the Administrator as conventional. The Administrator designated oil and grease as an additional conventional pollutant on July 30, 1979 (44 FR 44501; 40 CFR 401.16).

3. Best Available Technology Economically Achievable (BAT)

BAT represents the second level of stringency for controlling direct discharge of toxic and nonconventional pollutants. In general, BAT effluent limitation guidelines represent the best economically achievable performance of facilities in the industrial subcategory or category. The factors considered in assessing BAT include the cost of achieving BAT effluent reductions, the age of equipment and facilities involved, the process employed, potential process changes, and non-water quality environmental impacts including energy requirements, and such other factors as the Administrator deems appropriate. The Agency retains considerable discretion in assigning the weight to be accorded these factors. An additional statutory factor considered in setting BAT is economic achievability. Generally, EPA determines economic achievability on the basis of total costs to the industry and the effect of compliance with BAT limitations on overall industry and subcategory financial conditions. As with BPT, where existing performance is uniformly inadequate, BAT may reflect a higher level of performance than is currently being achieved based on technology transferred from a different subcategory or category. BAT may be based upon process changes or internal controls, even when these technologies are not common industry practice.

4. New Source Performance Standards (NSPS)

New Source Performance Standards reflect effluent reductions that are achievable based on the best available demonstrated control technology. Owners of new facilities have the opportunity to install the best and most efficient production processes and wastewater treatment technologies. As a result, NSPS should represent the most stringent controls attainable through the application of the best available demonstrated control technology for all pollutants (that is, conventional, nonconventional, and priority pollutants). In establishing NSPS, EPA is directed to take into consideration the cost of achieving the effluent reduction and any non-water quality environmental impacts and energy requirements.

5. Pretreatment Standards for Existing Sources (PSES)

Pretreatment standards apply to discharges of pollutants to publicly owned treatment works (POTW) rather than to discharges to waters of the United States. Pretreatment Standards for Existing Sources are designed to prevent the discharge of pollutants that pass through, interfere with, or are otherwise incompatible with the operation of POTWs. Categorical pretreatment standards are technology-based and are analogous to BAT effluent limitation guidelines. The General Pretreatment Regulations, which set forth the framework for the implementation of categorical pretreatment standards, are found at 40 CFR part 403. These regulations establish pretreatment standards that apply to all non-domestic dischargers. *See* 52 FR 1586 (Jan. 14, 1987).

6. Pretreatment Standards for New Sources (PSNS)

Section 307(c) of the Act calls for EPA to promulgate pretreatment standards for new sources at the same time it promulgates new source performance standards. Such pretreatment standards must prevent the discharge of any pollutant into a POTW that may interfere with, pass through, or may otherwise be incompatible with the POTW. EPA promulgates categorical pretreatment standards for existing sources based principally on BAT technology for existing sources. EPA promulgates pretreatment standards for new sources based on best available demonstrated technology for new sources. New indirect dischargers have the opportunity to incorporate into their facilities the best available demonstrated technologies. The Agency typically considers the same factors in promulgating PSNS as it considers in promulgating NSPS.

IV. Scope/Applicability of Proposed Rule

EPA solicits comments on various issues specifically identified in this preamble as well as any other issues related to this rule that are not specifically addressed in today's notice.

A. Facilities Subject to 40 CFR Part 449

EPA is proposing to establish effluent limitation guidelines and standards for primary commercial airports that conduct deicing operations and have more than 1,000 annual departures of scheduled commercial jet aircraft. Further information on the rationale for the proposed scope is provided in Section VII.D.1 of this preamble and in both the TDD and the EA.

B. Overview of Technology Requirements

The proposed rule would require an airport subject to this Part to:

- Collect at least a specified proportion (either 20 or 60 percent) of available ADF after it is sprayed on aircraft;
- Meet a specified numeric effluent limit for ADF wastewater collected and discharged on site; and
- Certify that it uses airfield pavement deicers that do not contain urea.

All references to ADF in today's proposed rule are for normalized ADF, which is ADF less any water added by the manufacturer or customer before ADF application.

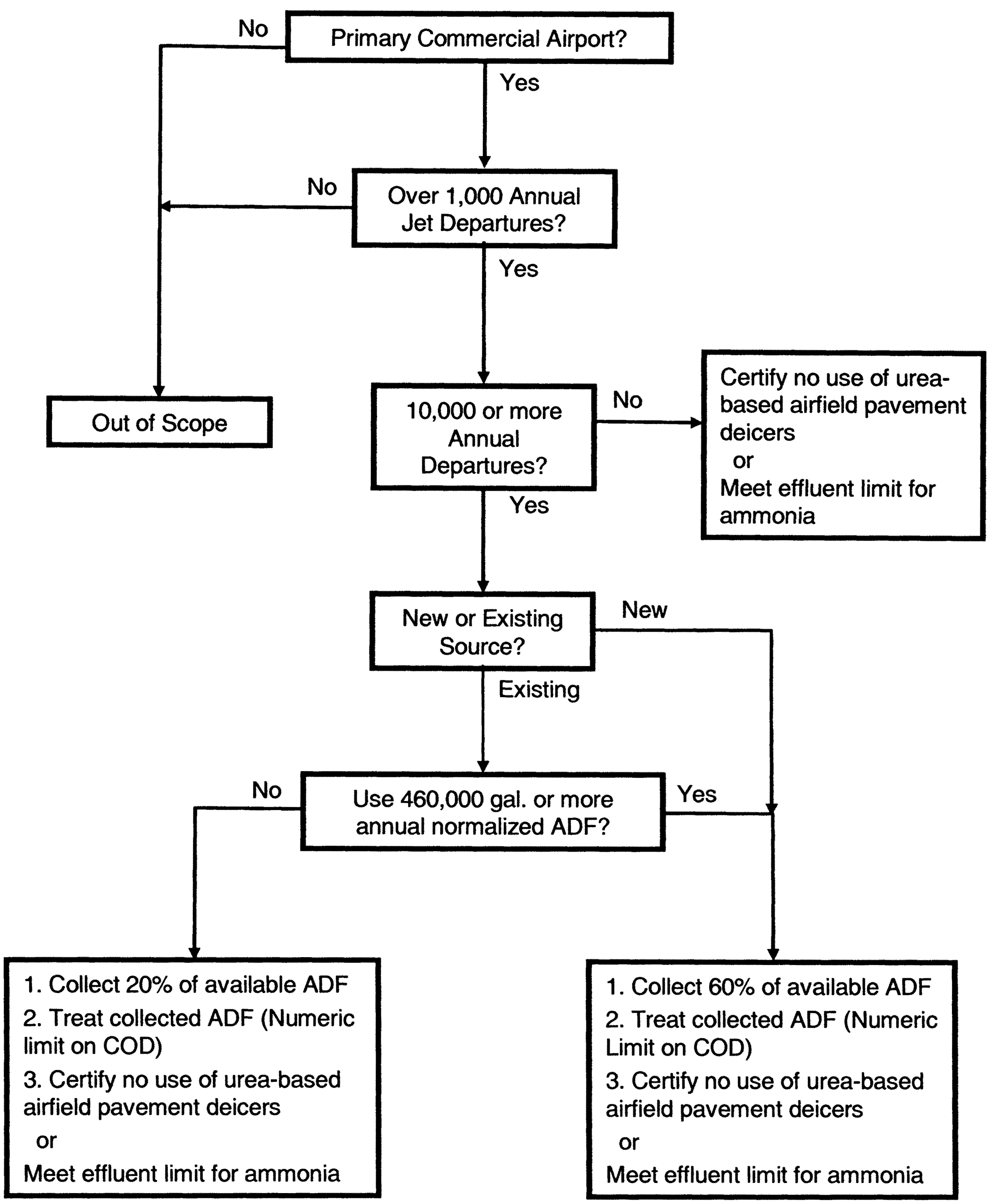
The technologies that serve as the basis for the proposed ELGs are summarized in Table IV–1 and Figure IV–1. These provisions are explained in Section VII of this preamble.

TABLE IV–1—SUMMARY OF PROPOSED AIRPORT DEICING EFFLUENT LIMITATION GUIDELINES AND STANDARDS

Regulatory level	Technology basis	Technical components	
		Airports > 1,000 annual jet departures and >= 10,000 annual departures	Airports > 1,000 annual jet departures and < 10,000 annual departures
BAT	1. 60% or 20% ADF capture.	1. Capture 60% of available ADF (for airports having >= 460,000 gal. ADF usage) or capture 20% (for airports < 460,000 gal. ADF usage).	1. Certify use of non-urea-based pavement deicers or Meet effluent limit for ammonia.
	2. Biological treatment	2. Treat wastewater to meet effluent limit for chemical oxygen demand (COD).	
	3. Pavement deicer product substitution.	3. Certify use of non-urea-based pavement deicers or Meet effluent limit for ammonia.	
NSPS	1. 60% ADF capture	1. Capture 60% of available ADF	1. Certify use of non-urea-based pavement deicers or Meet effluent limit for ammonia.
	2. Biological treatment	2. Treat wastewater to meet effluent limit for chemical oxygen demand (COD).	
	3. Pavement deicer product substitution.	3. Certify use of non-urea-based pavement deicers or Meet effluent limit for ammonia.	

Note: All references to ADF are for normalized ADF, which is ADF less any water added by the manufacturer or customer before ADF application.

Figure IV-1. Airport Deicing Effluent Guidelines and Standards: Proposed Scope of Regulation



V. Industry Profile

A. Airport Population

The Airport and Airway Improvement Act (AAIA), 49 U.S.C. Chapter 471, defines airports by categories of airport activities, including Commercial Service (Primary and Non-Primary), Cargo Service, and Reliever. These categories are not mutually exclusive; an airport may be classified in more than one of these categories. Another group of generally smaller airports, not specifically defined by AAIA, is commonly known as "general aviation" airports. EPA estimates that there are approximately 500 commercial service airports.

Commercial service airports are publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service. Passenger boardings refer to revenue passenger boardings on an aircraft in service in air commerce, whether or not in scheduled service. The definition also includes passengers who continue on an aircraft in international flight that stops at an airport in any of the 50 States for a non-traffic purpose, such as refueling or aircraft maintenance rather than passenger activity. Passenger boardings at airports that receive scheduled passenger service are also referred to as ''enplanements.''

Primary commercial service airports (primary airports) have more than 10,000 passenger boardings each year. Primary airports are further subdivided into Large Hub, Medium Hub, Small Hub and Non-Hub classifications, based on the percentage of total passenger boardings within the United States in the most current calendar year ending before the start of the current fiscal year.

B. FAA Deicing Requirements

The Federal Aviation Administration requires airlines to deice aircraft and airfield pavement to protect the safety of passenger and cargo operations. FAA regulations in 14 CFR Part 121 require a complete deicing/anti-icing program. The regulations in 14 CFR Parts 121, 125 and 135 regulate takeoff when snow, ice, or frost is adhering to wings, propellers, control surfaces, engine inlets, and other critical surfaces of the aircraft. FAA does not require airlines to use a specific technology when deicing aircraft. In fact, airlines develop their own deicing protocols to meet the requirements of 14 CFR 125.221. Additionally, FAA has released Advisory Circulars (AC) which provide guidance for aircraft and airfield deicing, including AC 20–73A (Aircraft Ice Protection), AC 135–16 (Ground Deicing & Anti-icing Training & Checking), AC 120–58 (Pilot Guide: Large Aircraft Ground Deicing) and AC 150/5300–14B (Design of Aircraft Deicing Facilities). Advisory Circulars are available on FAA's Web site at *http://www.airweb.faa.gov.*

C. Description of Deicing Operations

A major concern for the safety of passengers is the clearing of ice and snow buildup on runways, taxiways, roadways, gate areas, and aircraft. Two basic types of deicing/anti-icing operations are generally performed at an airport: the deicing/anti-icing of aircraft, and the deicing/anti-icing of paved areas, including runways, taxiways, roadways, and gate areas. The most common technique for the deicing/anti-icing of aircraft is the application of chemical deicing/anti-icing agents. Deicing of runways, taxiways, and roadways is most commonly performed using mechanical means, but may also be performed using chemical agents. The anti-icing of paved areas is typically conducted with anti-icing chemicals.

1. Aircraft Deicing

Aircraft deicing involves the removal of frost, snow, or ice from an aircraft. Aircraft anti-icing generally refers to the prevention of the accumulation of frost, snow, or ice. The responsibility for performing deicing/anti-icing varies between airports, but it is usually performed by a combination of individual airlines and support contractors, commonly called fixed-base operators (FBOs) or ground service providers. Airlines typically select procedures for deicing/anti-icing their aircraft, which are then approved by the FAA.

a. Chemical Deicing Practices

In the deicing/anti-icing process, aircraft are usually sprayed with deicing/anti-icing fluids (ADF) that contain chemical deicing agents; however, non-chemical methods are also performed. Deicing/anti-icing occurs when the weather conditions are such that ice or snow accumulates on an aircraft. During snowstorms, freezing rain, or cold weather that causes frost to accumulate on aircraft surfaces including the wings, deicing is necessary to ensure the safe operation of aircraft. Studies have concluded that even a small amount of ice, if located on critical aircraft surfaces (*e.g.,* leading edge of the wing), can cause significant decreases in lift.

The typical deicing season runs from October through April for most airports in the northern U.S. In colder areas, the deicing season may extend over a longer period. In warmer climates, the deicing season may be shorter or deicing may rarely occur. However, it is important to note that deicing may be needed in hot, humid areas at any time. Some aircraft may experience frost build-up after landing at an airport in a hot, humid area. (The phenomenon is similar to frost forming on a cold glass of water exposed to hot, humid air and occurs for the same reason that the cold glass developed frost. Fuel chills when a plane operates at high altitudes where the temperature is very cold. When the plane lands in a hot, humid area, the cold fuel chills the fuel tank. If the tank is very close to the surface of the wing, it causes frost to form on the wing.)

ADF works by adhering to aircraft surfaces to remove and/or prevent snow and ice accumulation. Non-chemical methods include the use of mechanical or thermal means (*e.g.,* infrared heating) to prevent, remove, or melt ice and snow. Two types of deicing are performed: Wet-weather and dry-weather deicing, depending on a number of climatic and operational factors. Wet-weather deicing is performed during storm events that include precipitation such as snow, sleet, or freezing rain. Dry-weather deicing is performed when changes in the ambient temperature cause frost or ice to form on aircraft but no precipitation is present. Dry-weather deicing may also be performed on some types of aircraft whose fuel tanks become super-cooled during high-altitude flight, resulting in ice formation at lower altitudes and after landing. Dry-weather deicing may occur at temperatures up to 55° Fahrenheit (F), but generally requires a significantly smaller volume of deicing fluid than wet-weather deicing.

During typical wet-weather conditions, 150 to 1,000 gallons of ADF may be used on a single commercial jet, while as little as 10 gallons may be used on a small corporate jet. An estimated 1,000 to 4,000 gallons may be needed to deice a larger commercial jet during severe weather conditions. Aircraft anti-icing fluids are applied in much smaller volumes than their deicing counterparts are. A commercial jet requires approximately 35 gallons of fluid for anti-icing after deicing. Generally, dry-weather deicing requires 20 to 50 gallons of deicing fluid, depending on the size of the aircraft.

Chemical aircraft deicers are categorized into four classes. Not all types are currently used. Fluid types vary by composition and allowed holdover time (the estimated time for which deicing/anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the treated surfaces of an aircraft). Type I is the most commonly used fluid and is used primarily for aircraft deicing. These types of fluids typically contain glycol as the active ingredient (usually ethylene glycol or propylene glycol), along with water and additives, and remove accumulated ice and snow from aircraft surfaces. Types II, III, and IV were developed for anti-icing. These fluids form a protective anti-icing film on aircraft surfaces to prevent the accumulation of ice and snow. Anti-icing fluids are composed of either ethylene glycol or propylene glycol, a small amount of thickener, water, and additives. The additives in aircraft deicing and anti-icing fluids may include corrosion inhibitors, flame retardants, wetting agents, identifying dyes, and foam suppressors. Type IV fluids can provide up to a 70 minute holdover time, depending on atmospheric conditions. (Holdover time is the amount of time a given aircraft treatment by ground anti-icing fluid remains effective. Holdover time effectively runs out when frozen deposits start to form or accumulate on treated aircraft surfaces.) Most large airlines use both Type I and Type IV fluids.

Aircraft deicing and anti-icing operations usually occur at terminal gates, gate aprons, taxiways, or centralized deicing pads. Centralized deicing pads may be located near terminals and gates, along taxiways serving departure runways, or near the departure end of runways. Each airport may use only one or a combination of all of these locations for deicing/anti-icing. The amount and type of deicing performed at each location may vary. For example, an airport with deicing pads may allow air carriers to perform minimal deicing at gates, at a level sufficient to move the aircraft safely, and require all other deicing operations to be conducted at a pad.

If deicing is not conducted at the gate, then, prior to takeoff, an aircraft will taxi to an airport-approved deicing/anti-icing location. Depending on the deicing location design, several aircraft may be deiced simultaneously on a single deicing pad. Deicing trucks and/or spray equipment mounted on fixed booms apply the appropriate ADF. One to four deicer trucks may be used for deicing a single aircraft, depending on its size and weather conditions. When holdover times are exceeded prior to takeoff, secondary deicing/anti-icing is necessary. If an aircraft must return to the gate or another designated location for secondary deicing/anti-icing, its departure may be substantially delayed. The need for secondary deicing will likely decrease as more airlines use Type IV fluids to extend the allowable holdover time.

While the FAA has issued regulations and guidance on conducting deicing/anti-icing operations, the aircraft pilot is ultimately responsible for determining whether the deicing performed is adequate. The pilot may inspect the aircraft after deicing and order additional deicing or anti-icing.

Dry-weather deicing, also referred to as clear ice deicing, may be performed whenever ambient temperatures are cold enough to form ice on aircraft wings (below 55° F). Dry-weather deicing is also used to defrost windshields and wingtips on commuter planes and is usually conducted throughout the entire deicing/anti-icing season.

b. Non-Chemical Deicing Practices

Non-chemical deicing methods involve mechanical or thermal means to remove ice and snow from aircraft surfaces. Dry, powdery snow can be swept from aircraft using brooms or brushes. Hot air blowers can also be used to remove snow mechanically with forced air and to melt ice and snow. In addition, some smaller aircraft are equipped with inflatable pneumatic or hydraulic boots that can expand to break ice off the leading edges of wings and elevators.

Mechanical snow removal methods (*e.g.,* using nylon brooms and ropes to remove snow from parked aircraft) are typically only used in the early morning because they are time-intensive and labor-intensive, and would be too disruptive to airline schedules during the day. Mechanical methods are typically also used in conjunction with fluid application and are dependent on climate and operational variables. Personnel must be properly trained and provided with appropriate equipment so as not to damage navigational equipment mounted on aircraft. Airlines typically use brooms to remove as much snow and ice as possible before applying conventional aircraft deicing fluids.

Other non-chemical deicing practices—infrared heating, forced air and hot air systems—are being used at several airports throughout the U.S. These technologies are described in Section VII.B.3, Pollution Prevention Technologies.

2. Airfield Pavement Deicing

Pavement snow removal and deicing/anti-icing removes or prevents the accumulation of frost, snow, or ice on runways, taxiways, aprons, gates, and ramps. A combination of mechanical methods and chemical deicing/anti-icing agents is used for pavement deicing at airports. Runway deicing/anti-icing is typically performed by airport personnel or a contractor hired by the authority. Some ramp, apron, gate, and taxiway deicing/anti-icing may be performed by other entities, such as airlines and FBOs that operate on those areas. Pavement deicing typically occurs during the same season as aircraft deicing, but may be shorter or longer than the aircraft deicing season.

a. Mechanical Methods

Mechanical methods, such as plows, brushes, blowers, and shovels for snow removal, are the most common form of runway deicing, and may be used in combination with chemical methods. Airports generally own multiple pieces of snow removal equipment and have employees trained to operate them. Sand may be used to increase the friction of icy paved areas. Because winter storm events can be unpredictable, personnel trained in pavement deicing/anti-icing may be available at an airport 24 hours a day during the winter season.

b. Chemical Methods

Because ice, sleet, and snow may be difficult to remove by mechanical methods alone, most airports use a combination of mechanical methods and chemical deicing agents. Common pavement deicing and anti-icing agents include potassium acetate, sodium acetate, urea, ethylene glycol-based fluids, propylene glycol-based fluids, and sodium formate. Road salt (*i.e.,* sodium chloride or potassium chloride) may be used to deice/anti-ice paved areas that are not used by aircraft (*e.g.,* automobile roadways and parking areas) but are not considered suitable for deicing/anti-icing taxiways, runways, aprons, and ramps because of their corrosive effects on aircraft.

Many airports perform deicing of heavy accumulations of snow and ice using mechanical equipment followed by chemical applications. Pavement anti-icing may be performed based on predicted weather conditions and pavement temperature. Deicing and anti-icing solutions are applied using either truck-mounted spray equipment or manual methods.

3. Estimates of Deicing Activity

a. Aircraft Deicing Chemical Usage

Airlines use approximately 25 million gallons of ADF annually, consisting of 22.1 million gallons of propylene glycol-based deicers and almost 3 million gallons of ethylene glycol-based deicers. EPA estimates that approximately 320 primary airports conduct deicing operations annually and that approximately 85 percent of this ADF (21.6 million gallons) is used at 110 of the 320 airports.

b. Airfield Pavement Deicing Chemical Usage

Primary airports use approximately 71 million pounds of chemical deicers on airfield pavement (runways, taxiways and ramps) annually. The six most frequently used deicers, with estimated percentages by weight, are as follows: potassium acetate (63 percent); urea (12 percent); propylene glycol-based fluids (11 percent); sodium acetate (9 percent);

sodium formate (3 percent); and ethylene glycol-based fluids (2 percent).

VI. Summary of Data Collection

A. Previous EPA Data Collection Activities

1. 1993 Screener Questionnaire

In 1992, EPA began developing effluent guidelines and standards for the Transportation Equipment Cleaning (TEC) category (40 CFR Part 442). The scope of the TEC regulation at that time included facilities that clean the interiors of tank trucks, rail tank cars, and tank barges; facilities that clean aircraft exteriors; and facilities that deice/anti-ice aircraft and/or airport pavement. Initial data collection efforts for this project related to airport deicing operations included development and administration of a ''screener'' questionnaire that was administered in 1993. The screener questionnaire was developed, in part, to enable EPA to: (1) Identify facilities that perform TEC aircraft operations; (2) evaluate facilities based on wastewater, economic, and operational characteristics; and (3) develop technical and economic profiles of the industry. Subsequent to distribution of the screener questionnaire, EPA decided not to include the aircraft segment as part of the TEC effluent guidelines that were promulgated in 2000 (65 FR 49665, August 14, 2000). The Agency indicated that its recently-issued stormwater regulations and permits under the NPDES program imposed new requirements for airport discharges, and that aircraft cleaning and airport deicing operations were significantly different from other portions of the TEC category.

EPA mailed the screener questionnaire to 760 entities that potentially perform aircraft exterior cleaning and/or aircraft or pavement deicing/anti-icing operations. Following the screener questionnaire mail-out and analyses of responses, EPA estimated that, in 1993, there were 588 entities *(i.e.*, airlines and FBOs) that perform deicing/anti-icing operations.

2. 1998–99 Preliminary Data Summary

EPA conducted a study of airport deicing practices in 1998–99 and published a report in 2000. (Preliminary Data Summary: Airport Deicing Operations (Revised), Document No. 821–R–00–016, August 2000). The study described deicing operations in the industry, wastewater characteristics and procedures for its collection and treatment. The study was conducted to comply with CWA sec. 304(m), which requires the Agency to publish a biennial Effluent Guidelines Plan, and a consent decree in *Natural Resources Defense Council and Public Citizen, Inc.* v. *Browner* (D.D.C. 89–2980, as modified February 4, 1997). As part of the study, EPA distributed short questionnaires to several aviation sectors, including those involved in deicing; conducted site visits to airports; and conducted wastewater sampling episodes.

a. Questionnaires

In 1999, EPA sent questionnaires to airports, an airline industry association, equipment vendors, and publicly owned treatment works (POTW), and requested data about the 1998–99 deicing season. The Airport Questionnaire was sent to nine airports and asked for information on aircraft and airfield deicing activities; wastewater handling and treatment; and airport structure, finances and operations. A questionnaire requesting financial data was sent to an airline industry association, which provided information about the deicing operations of 12 of its members, and eight regional airlines also received questionnaires. The Vendor Questionnaire was sent to nine businesses and requested information about equipment used to collect, control, recycle/recover, treat or reduce the generation of glycol-contaminated wastewater from aircraft and airfield deicing operations. The POTW Questionnaire was sent to nine facilities and requested information about potential pollutants in wastewater discharges from airports, and the potential environmental impacts stemming from POTWs' acceptance of these wastes.

b. Wastewater Sampling

EPA conducted six sampling episodes for the study. Two of these episodes obtained data on ADF, and four episodes obtained data on ADF-contaminated wastewater and final effluent data from airports with various collection and treatment systems.

c. Airport Site Visits

EPA visited 16 airports between 1997 and 1999 (including one visit before the formal commencement of the study). Information gathered included deicing operations, names and quantities of deicing chemical products used, wastewater characterization, treatment technologies and costs, and financial data. The Agency obtained effluent self-monitoring data from some of the airports that were visited.

d. Other Data Sources

EPA collected data on NPDES permits and from the Toxic Release Inventory database, which have wastewater discharge information. EPA also collected data from state, local, and other federal agencies, including the FAA, Department of Transportation and the United States Geological Survey (USGS); and Canadian federal agencies involved with airport environmental issues. These included interviews conducted during site visits, airport effluent monitoring data, airline operations data (*i.e.*, departures and enplanement statistics), and economic and financial information about the industry. All of the collected data are available in the record for this proposed rule.

B. 2006–07 Industry Surveys

For this proposed rule, EPA developed a series of survey questionnaires to compile a complete profile of the industry with regard to type and amounts of deicing chemicals used, collection systems, and wastewater treatment systems. These questionnaires expanded on the Agency's earlier survey efforts by the design of a scientific national statistical sample of airports and development of a reasonable national estimate of deicing activity by major airlines. A comprehensive set of questions and data tables was also developed. In designing the questionnaires, EPA consulted with airport and airline industry representatives, including the American Association of Airport Executives (AAAE), Airports Council International—North America (ACI–NA) and the Air Transport Association (ATA). The Office of Management and Budget (OMB) approved the questionnaires on January 13, 2006, and EPA distributed the questionnaires during 2006 and 2007.

1. Airline Screener

EPA designed a short ''screener'' questionnaire to obtain basic information from air carriers on which organizations actually performed deicing services for a particular carrier, at specified airport locations (*i.e.,* the airline conducted its own deicing, it contracted with another airline, or it used an FBO). EPA used the results of this questionnaire to select respondents for the Detailed Airline Questionnaire. The screener was distributed to 72 airlines and requested information on deicing activities at 149 airports. EPA distributed the screener to the industry in April 2006.

2. Airport Questionnaire

EPA designed the Airport Deicing Questionnaire to serve as the Agency's primary data source for airport-specific information. The questionnaire requested information on a number of topics including, general airport information, deicing operations, deicing stormwater collection and conveyance, deicing stormwater treatment, sampling data, pollution prevention, receiving waters, and airport financial information.

EPA distributed the Airport Deicing Questionnaire to the industry in April 2006. The questionnaire was sent to 153 airports, including a census of all large and medium hub airports, as well as a sample survey of all Small and Non-Hub Airports. (General aviation airports were not included in the survey, except for a few with large cargo operations, because these airports are used mainly by small private airplanes that typically do not fly during icing conditions, and therefore are sites where little or no ADF use occurs.)

3. Detailed Airline Questionnaire

EPA designed the Detailed Airline Questionnaire in order to learn more about the airlines' role in deicing operations, as well as to get information that is more precise on ADF usage. This questionnaire was EPA's primary data source for airline-specific information. The questionnaire asked questions on topics including deicing operations, ADF purchase and usage, pollution prevention practices, and operational costs. The questionnaire was sent in March 2007 to 58 air carriers, covering deicing operations at 57 airports. This questionnaire requested information on a number of topics including: General airline information, airline deicing practices, pollution prevention practices and deicing costs.

C. Site Visits

In order to become familiar with the day-to-day operations at airports, as well as learn some of the more site-specific issues that arise with deicing, EPA conducted site visits at more than 20 airports. EPA visited airports that had specific treatment technologies in place, in order to learn more about these technologies. Some of the airports included were Denver, Pittsburgh and General Mitchell (Milwaukee). All site visits were documented with Site Visit Reports (SVRs), which are in the record for today's proposed rule (Record Index, Section 2.3).

D. Wastewater Sampling Episodes

EPA collected several wastewater samples for chemical analysis during sampling episodes at six airports to characterize pollutants found in ADF-contaminated runoff, and to assess the performance of treatment systems. The Agency conducted episodes at these six airports in 2005 and 2006: Minneapolis/St. Paul International Airport, Detroit Metropolitan Wayne County International Airport, Albany International Airport, Denver International Airport, Greater Rockford (Illinois) Airport, and Pittsburgh International Airport. At the first two airports, EPA conducted one-day sampling episodes, to provide a general characterization of wastewater from deicing operations. The subsequent four events were multiple-day performance sampling episodes, which were designed to document the performance of wastewater treatment systems.

For each analytical chemical class or parameter, EPA collected 24-hour composite samples when possible, in order to capture the variability in the waste streams containing ADF generated throughout the day. EPA used the data from the laboratory analyses of these samples to develop a list of pollutants of concern, and characterize the raw wastewater at airports. EPA used the data collected from the influent, intermediate, and effluent points to analyze the efficacy of treatment at the facilities, and to develop current discharge concentrations, loadings, and the treatment technology options for the Airport Deicing effluent guideline. EPA used effluent data, along with data provided by industry in the questionnaires and other sources, to calculate the long-term averages and limitations for each of the proposed regulatory options. During each sampling episode, EPA collected flow rate data corresponding to each sample collected and production information from each associated production system for use in calculating pollutant loadings. EPA has included in the public record all information collected for which a facility has not asserted a claim of Confidential Business Information (CBI) or which would indirectly reveal information claimed to be CBI.

After conducting the sampling episodes, EPA prepared sampling episode reports for each facility. These reports included descriptions of the wastewater treatment processes, sampling procedures, and analytical results. EPA documented all data collected during sampling episodes in the sampling episode report for each sampled site. Non-confidential business information from these reports is available in the public record for this proposal. For detailed information on sampling and preservation procedures, analytical methods, and quality assurance/quality control procedures see the Quality Assurance Project Plans and the Sampling and Analysis Plans (Record Index, Section 2.4).

E. Other Data Collection

EPA collected other information from various other data sources including: National Pollutant Discharge Elimination System (NPDES) permits for information on current permit requirements; industry correspondence on technology costs and long-term wastewater monitoring data; and searches of technical and scientific literature, covering current deicing practices and treatment technologies, current airport deicing runoff data, chemical information and environmental impact studies, and current stormwater regulations in the United States and other countries.

F. Summary of Public Participation

EPA has met or corresponded with many airport and airline representatives, citizen and environmental groups, vendors of deicing chemicals and equipment, state permit agencies, other Federal agencies and engineering consulting firms. The Agency has attended conferences on airport deicing and has given presentations at several of those conferences. Correspondence from these organizations about the proposed rule is in the Record for the proposed rule.

VII. Technology Options, Costs, Wastewater Characteristics, and Pollutant Reductions

A. Wastewater Sources and Wastewater Characteristics

1. Aircraft Deicing

Most ADF is applied to aircraft through pressurized spraying systems, mounted either on trucks that move around an aircraft, or on large fixed boom devices located at a pad dedicated to deicing. Airlines typically purchase ADF in concentrated form (normalized) and dilute it with water prior to spraying.

Most of the aircraft deicing fluid is Type I fluid, which is not designed to adhere to aircraft surfaces. Consequently the majority of Type I ADF is available for discharge due to dripping, overspraying, tires rolling through or sprayed with fluid, and shearing during takeoff. Once the ADF has reached the ground, it will then mix with precipitation, as well as other chemicals found on airport pavements. (These chemicals typically include aircraft fuel, lubricants and solvents, and metals from aircraft, ground support and utility vehicles.) Water containing these substances enters an airport's storm drain system. At many airports, the storm drains discharge directly to waters of the United States with no treatment.

Type IV fluid, an anti-icing chemical, is designed to adhere to the aircraft. Because of this adherence characteristic, EPA estimated that the majority of Type IV fluid is not available for discharge.

For the purposes of this proposed rule, the pollutant loadings are discussed in terms of applied ADF and how much of that is expected to be discharged. A more detailed discussion of loadings estimates is presented later in this section. Given the highly variable nature of storm events, it is difficult to estimate flows or concentrations of ADF-contaminated stormwater generated at an airport. Those factors are greatly dependent on the size of the storm event associated with the discharge, drainage characteristics, ADF collection systems (if present), and airport operations. Additionally, due to the design of drainage systems at some airports, their discharges may occur well after a storm event has completed.

2. Airfield Pavement Deicing

Most solid airfield deicing chemical products are composed of an active deicing ingredient (*e.g.,* potassium acetate, sodium acetate) and a small amount of additives (*e.g.,* corrosion inhibitors). Liquid airfield deicing chemical products are composed of an active ingredient (*e.g.,* potassium acetate, propylene glycol), water, and minimal additives. The airfield deicing products that include salts (*i.e.,* potassium acetate, sodium acetate, and sodium formate) will all ionize in water, creating positive salt ions (K^+, Na^+), BOD_5 and COD load as the acetate or formate ion degrades into carbon dioxide (CO_2) and water. Pavement deicers containing urea will degrade to ammonia, and generate BOD_5 and COD load as well.

Most of EPA's sampling data does not include airfield pavement deicers. However, EPA collected samples from a few locations at Detroit Metro Airport that contain airfield deicing stormwater. Large hub airports, both Detroit Metro and Pittsburgh, provided sampling data associated with stormwater contaminated by airfield pavement deicers. More information on these sampling activities is provided in the TDD. As with the aircraft deicers, the variablity of storm events and drainage systems make it difficult to estimate flows or concentrations of pavement deicing waste streams generated at an airport.

B. Control and Treatment Technologies in the Aviation Industry

The ADF application process has presented a challenge for airports attempting to manage their contaminated stormwater streams. The airlines' process of applying ADF to aircraft through high pressure spraying, combined with their typical practices of spraying the aircraft outdoors in multiple, large unconfined (but usually designated) spaces, results in pollutants being dispersed over a wide area and entering storm drains at multiple locations. This process contrasts sharply with many other industries where pollutants are generated in confined areas, managed through a piping system, and not commingled with precipitation.

EPA has identified several technologies that are available to collect and manage portions of the ADF wastestream. Some of these collection technologies are more effective than others; however, EPA has not identified any single technology that is capable of collecting all applied ADF. Typically, ADF that is not captured becomes available for discharge, either through an airport's drainage system, or from shearing off the aircraft during takeoff.

Once the ADF wastestream is collected, it can be treated, and this process is similar to many other industries that generate wastewater. EPA identified four technologies available for treating ADF wastewater.

EPA also examined pollution prevention technologies, which can reduce or eliminate use of ADF chemicals and urea for pavement deicing.

1. Aircraft Deicing Fluid Collection Technologies

a. Glycol Recovery Vehicle

A glycol recovery vehicle (GRV) is a truck that utilizes a vacuum mechanism to gather stormwater contaminated with ADF resulting from deicing operations. A GRV is a modular technology, in that collection capacity can be increased by using additional units, without the complicating factors of in-ground construction associated with some other technologies. An airport may increase its overall ADF collection capacity by purchasing or leasing larger units and/or additional units.

GRV trucks are typically stationed near the ADF spraying trucks and are deployed either during aircraft deicing activities or, after the aircraft deicing activity has completed. The truck then transports the ADF-contaminated stormwater to an on-site storage facility, after which the material is either treated at the airport or sent off site for treatment. EPA estimates that GRVs typically capture approximately 20 percent of the available ADF when properly operated and maintained.

b. Plug and Pump

The plug-and-pump collection system involves simple alterations to an airport's existing storm drain system, typically the insertion of blocking plugs or similar devices in storm drains, combined with use of GRVs, to contain and collect ADF-contaminated stormwater. Drainage system modifications involve the placement of temporary blocking devices at storm drain inlets, and/or installation of shutoff valves at one or more points in the storm sewer system. Before a deicing event begins, airport personnel activate the blocking devices, which trap the ADF-contaminated stormwater in the collection system. After the deicing activity ceases, the vacuum trucks pump the contaminated stormwater from the storm sewer system and transport the liquid to on-site storage and subsequent treatment. EPA estimates that plug-and-pump systems, which incorporate GRVs, may capture approximately 40 percent of the available ADF when properly operated and maintained.

c. Centralized Deicing Pads

A centralized deicing pad is a facility on an airfield built specifically for aircraft deicing operations. It is typically a paved area adjacent to a gate area, taxiway, or runway, and constructed with a drainage system separate from the airport's main storm drain system. It is usually constructed of concrete with sealed joints to prevent the loss of sprayed ADF through the joints. The pad's collection system is typically connected to a wastewater storage facility, which then may send the wastewater to an on-site or off-site treatment facility.

Some airports use GRVs in combination with centralized deicing pads in order to maximize collection and containment of ADF-contaminated stormwater. Airports typically locate the pads near the gate areas or at the threshold of a runway to minimize delays in aircraft takeoff and to enhance the effectiveness of the ADF applied by limiting time between application and takeoff.

Centralized deicing pads reduce the volume of deicing wastewater by restricting deicing to very small areas, and managing the captured wastewater through a dedicated drain system. EPA estimates that central deicing pads allow airports to capture about 60 percent of the available ADF.

In addition, although the name implies a small collection area, central pads designed to accommodate more than one commercial aircraft generally encompass several acres. A deicing pad is specially graded and designed to capture highly contaminated runoff, which can then be sent to storage ponds, tanks or directly to treatment. By capturing high concentrations of spent ADF, the feasibility of recycling increases. Recovered glycol is typically sold to chemical manufacturers for use in a variety of products, including coatings, paints, plastics and polyester fibers.

d. Summary of ADF Collection Technology Usage

EPA estimates the number of airports that use each of the above collection technologies in Table VII–1. Some airports use more than one technology, and some of the airports in the estimate use the technology for only a portion of their ADF-contaminated stormwater.

TABLE VII–1—ESTIMATED TOTALS OF ADF COLLECTION TECHNOLOGIES USED BY AIRPORTS

Collection technology	Number of airports
Glycol Recovery Vehicle	53
Plug and Pump	29
Centralized Deicing Pad	66

See the Technical Development Document for further explanation of EPA's estimates of the ADF capture rates for the fluid collection technologies.

2. Wastewater Treatment and Recycling Technologies

EPA identified four potential BAT wastewater technologies. Two of these technologies are biological in that they use microorganisms to break down the glycol. The other two technologies are mechanical and produce two wastestreams, one a high concentrated glycol stream, and one that is primarily water for discharge. The high glycol stream can, in some instances, be recycled and used for a variety of products. There have been limited instances in the U.S. of recycled glycol used for ADF formulation.

a. Anaerobic Fluidized Bed

An Anaerobic Fluidized Bed (AFB) treatment system uses a vertical, cylindrical tank in which the ADF-contaminated stormwater is pumped upwards through a bed of granular activated carbon at a velocity sufficient to fluidize, or suspend, the media. A thin film of microorganisms grows on and coats each granular activated carbon particle, providing a vast surface area for biological growth. These microorganisms provide treatment of the ADF-contaminated stormwater. Byproducts from the AFB treatment system include methane, carbon dioxide and new biomass (animal material, *e.g.* bacteria).

Treating wastes using an anaerobic biological system as compared to an aerobic system offers several advantages. The anaerobic system requires much less energy since aeration is not required and the anaerobic system produces less than 10 percent of the sludge of an aerobic process. In addition, because the biological process is contained in a sealed reactor, odors are eliminated. Based on EPA sampling results, the AFB treatment system successfully removed over 98 percent of BOD_5, over 97 percent of COD, and over 99 percent of propylene glycol from the wastestream. This reduced the BOD_5 and COD loads discharged to receiving waters by over 98 and 97 percent, respectively. Two airports in the United States use the AFB technology: Albany County Airport in Albany, New York, and Akron-Canton Regional Airport, Akron, Ohio.

b. Ultrafiltration/Reverse Osmosis

Ultrafiltration/Reverse Osmosis (UF/RO) technology filters ADF-contaminated stormwater at a high temperature (75 °C) using an ultrafiltration membrane as its first stage. Next, the deicing fluid (filtrate) can be dewatered using a reverse osmosis membrane as a second stage. Since the ultrafiltration membrane is effective at removing contaminants, the RO stage is used for dewatering and glycol separation. This process produces a glycol-laden stream that can be distilled in an additional stage to increase its glycol concentration. Concentrated glycol streams can be recycled as a feedstock in chemical manufacturing. The effluent from the UF/RO system contains small amounts of glycol, carbonaceous BOD (cBOD) and COD, and can either be discharged to surface water, or sent to a POTW for further treatment.

Based on EPA sampling results, the RO treatment system successfully removed over 99 percent of BOD_5, over 99 percent of COD, and over 99 percent of propylene glycol. UF/RO technology is used at Pittsburgh International Airport.

c. Mechanical Vapor Recompression and Distillation

Mechanical Vapor Recompression (MVR) followed by distillation is typically used when glycol concentrations in ADF-contaminated stormwater are greater than 5 percent. This type of a system is not generally practical for lower concentration glycol contaminated stormwater, which would typically be discharged directly to a POTW for treatment. The MVR/distillation technology generates a concentrated glycol stream (containing greater than 99 percent glycol) that can be sold as a chemical feedstock. The effluent from the MVR/distillation system contains propylene glycol, cBOD and COD and it must be discharged to a POTW for further treatment.

MVR and distillation is used at Denver International Airport for recycle and recovery of spent ADF. The system first treats ADF-contaminated stormwater using the MVRs, which increase the glycol concentration to approximately 40 percent. Effluent from the MVRs is then treated by distillation to increase the glycol concentration to approximately 99 percent. The glycol product is passed through polishing filters to remove residual contaminants allowing for resale of the product as a chemical feedstock. Overheads (distillate) from both the MVRs and distillation columns contain propylene glycol and they are sent to a POTW for additional treatment.

Based on EPA sampling results, the MVR/Distillation treatment system successfully removed over 93 percent of BOD_5, over 97 percent of COD, and over 98 percent of propylene glycol.

d. Aerated Pond

An aerated pond uses mechanical aerators either to inject air into the wastewater or to cause violent agitation of wastewater and air in order to achieve oxygen transfer to the wastewater. Bacteria are suspended in the wastewater, and aid in the biodegradation of glycol. Contaminated stormwater is retained in the detention pond during the deicing season and discharged later, after microorganisms present in the pond have biodegraded the glycols. The detention pond is monitored and nutrients are added, pH is adjusted, and anti-foaming agents are added as needed. The biodegradation of glycol is temperature-dependant and predominantly occurs during the spring and early summer months when ambient temperatures are higher. When the BOD_5 concentration has been sufficiently reduced, the volume is discharged to surface waters.

Based on EPA sampling results, the aerated pond treatment system successfully removed 100 percent of BOD_5, and over 93 percent of COD. An aerated pond system is currently in use at Greater Rockford Airport, in Rockford, Illinois.

3. Pollution Prevention Technologies

EPA has identified several technologies that reduce ADF usage to some extent while safely deicing aircraft, and one applicable to airfield pavement deicing, that are in use at airports across the United States. However, there are limited data on the actual pollutant reductions that these technologies may achieve. While the effectiveness or cost-effectiveness of these technologies has not been documented, these technologies can reduce the amount of deicing chemicals required to deicing aircraft and airfields. The reduction of chemicals will not only have a positive environmental effect, but may also be cost-effective, as the decrease in costs of purchased deicing chemicals may offset the cost of the technology itself.

a. Infrared Deicing Systems

A few U.S. airports have used infrared (IR) heating systems for several years. The systems have been demonstrated to deice aircraft effectively, which substantially reduces ADF usage. One type of IR system consists of an open-ended hangar-type structure with IR generators mounted inside, suspended from the ceiling. The IR equipment is designed to use specific wavelengths that heat ice and snow, and minimize heating of aircraft components. The IR energy level and wavelength may be adjusted to suit the type of aircraft. Although the system can deice an aircraft, it cannot provide aircraft with anti-icing protection. Consequently, when the ambient temperature is below freezing, anti-icing fluid is typically applied to the aircraft after it leaves the hangar. Since the aircraft surfaces are dry, the volume of anti-icing fluid required is less than for typical anti-icing operations. In addition, a small amount of deicing fluid may be required for deicing areas of the aircraft not reached by the IR radiation, such as the flap tracks and elevators. The system, therefore, does not completely replace glycol-based fluids, but greatly reduces the volume required.

Documents provided by a vendor describe use of an IR system that reduces the amount of Type I ADF required by up to 90 percent. Two large hub airports, Newark Liberty International, Newark, New Jersey, and John F. Kennedy International Airport, New York, use IR systems for some of their flights. If this technology can be applied widely, it may prove to be a highly effective means of reducing ADF pollution.

EPA has not obtained substantial data documenting the amount of reduced glycol usage from use of IR systems, nor information on the availability of the technology for broader or industry-wide installation. EPA is interested in receiving any available data on those topics to documenting IR costs including (*e.g.*, the capital costs of installing an IR facility, operating and maintenance costs, especially energy costs, glycol used during deicing and siting/sizing requirements for an IR facility). Because IR is not widely available or used, EPA does not propose to identify IR as an available technology for purposes of establishing ELGs. However, the Agency may reconsider this technology, if sufficient data support a conclusion that this technology is available. Specifically, EPA would require information proving that IR is an available technology for a sufficient percentage of an airports total deicing activity, as well as information on the amount of time required for deicing, as well as any sizing and siting requirements for placing an IR facility.

b. Forced Air/Hot Air Deicing Systems

Forced air/hot air deicing systems are currently in operation at a few U.S. airports. These systems use forced air to blow snow and ice from aircraft surfaces. Some systems allow deicing fluids to be added to the forced air stream at different flow settings (*e.g.,* 9 and 20 gpm), while other systems require separate application of deicing fluid. Several vendors are currently developing self-contained, truck-mounted versions of these forced-air systems, and most systems can be retrofitted onto existing deicing trucks.

A similar method to truck-mounted forced-air systems is the double gantry forced-air spray system. The gantries support a set of high- and low-pressure nozzles, which blast the aircraft surfaces with heated air at a pressure of 40 to 500 pounds per square inch. When weather conditions are severe, a small volume of water and glycol may be added to the air stream to remove dense coverings of snow and ice. Airfield use of the gantry system has been limited perhaps because it is a permanently mounted system that has been known to cause delays in aircraft departures.

c. Product Substitution

Another solution to environmental problems associated with deicing chemicals is to replace chemical deicers with more environment-friendly products. In the ADF products category, initially the predominant deicers were based on ethylene glycol, whereas in recent years propylene glycol-based deicers, which are less toxic to mammals, have become more widely used. Chemical manufacturers, the aviation industry and the U.S. Air Force are continuing to explore development of deicers that could generate lower levels of pollutants compared to the glycol-based products.

In the field of airfield pavement deicers, several types of products are available as alternatives to glycol-based and urea-based deicers, such as potassium acetate, sodium formate and sodium acetate.

d. Transportation Research Board Report

The Transportation Research Board (TRB), a division of the National Academies of Science, established a research panel to develop fact sheets on deicing practices to assist airports in reducing their deicing chemical usage and discharges. A report was prepared in 2009 under TRB's Airport Cooperative Research Program (ACRP), titled ''Deicing Planning Guidelines and Practices for Stormwater Management Systems.'' This report (DCN AD01191) and the fact sheets (DCN AD01192) are in the docket for today's proposed rule.

C. Pollutants of Concern

Airport deicing stormwater is generated when airfield and aircraft deicing/anti-icing chemicals mix with snow, freezing precipitation or rainwater. In addition, other airport-related activities, including aircraft fueling and maintenance activities, may contribute pollutants to stormwater. Because of the difficulties in characterizing airport deicing stormwater, EPA evaluated pollutants detected in the stormwater, pollutants present in source water (*i.e.*, prior to contamination with ADF), and pollutants that are present in ADF prior to use to determine which pollutants are present in deicing stormwater. The primary source of information used to identify potential pollutants of concern from deicing stormwater was EPA's sampling episodes, detailed in Section VI, as well as information presented in available NPDES permits and the Airport Questionnaire.

1. Aircraft Deicers

EPA, through its review of sampling data, discussions with experts in the field of chemical deicers, and review of NPDES permits, identified over 90 pollutants associated with ADF-contaminated stormwater.

EPA shortened the list of pollutants to those that were directly associated with aircraft deicing. This was done by reviewing information provided by experts and excluding pollutants that were thought to be associated with one of the following sources; source water, aircraft and vehicle fueling operations, maintenance-related operations, or runoff from building roofs.

Having identified pollutants that are present in airport deicing stormwater, the Agency next needed to consider which pollutants should be controlled. EPA did not consider a pollutant as a potential pollutant of concern if it possesses the following characteristics:

- The pollutant is present in the deicing stormwater from a source other than deicing chemical use;
- The pollutant is discharged in relatively small amounts and is neither causing nor likely to cause toxic effects;
- The pollutant is detected in the effluent from only a small number of airports and is uniquely related to those facilities; or
- The pollutant cannot be analyzed by EPA-approved or other established methods.

2. Airfield Deicers

While field information on the constituents of airfield deicing and anti-icing chemicals is scarce, EPA determined which chemicals are commonly used based on the Airport Questionnaire responses. EPA did not identify an available technology to collect and treat pavement deicing pollutants, and therefore did not collect wastewater samples from pavement deicing discharges. Some of the most common airfield deicing and anti-icing chemicals include potassium acetate, sodium acetate, urea, sodium formate, and glycols.

3. Summary

After reviewing these criteria, EPA identified 21 chemicals or parameters as pollutants of concern. Based on our knowledge of usage volumes, and known effects, EPA focused on the glycols in ADF fluids, and the ammonia in urea-based pavement deicers. Section VII.D.2 below discusses how EPA determined which of these pollutants of concern should become regulated pollutants in today's proposed rule. *See* the TDD and the EIB for further discussion of pollutants of concern.

D. Options Considered for Proposal

Current airport deicing operations involve application of chemicals to both aircraft and airfield pavement. ADF may be dispersed over a large area due to the high-pressure spraying process used with aircraft as well as shearing during aircraft taxiing and takeoff. Pavement chemicals, while not sprayed at high pressure, are nonetheless similarly dispersed over a large area, namely runways, taxiways and aprons. The deicing chemicals mix with stormwater and are conveyed through a combination of overland flow and conveyance structures (ditches and pipes). At some airports, the contaminated stormwater is discharged untreated directly to waters of the United States. At other airports, the wastewater is treated before discharge, sent to a POTW or off-site waste contractor, and/or discharged to groundwater.

In order to reduce discharges of untreated ADF wastewater for this industry, EPA concluded that the best available technology would need to include two basic components. The first component is a requirement to capture (collect) a certain percentage of available ADF. The second component is a requirement to treat the collected ADF to meet specified end-of-pipe discharge limitations. In many other industrial sectors, wastewater is typically generated and handled in confined systems such as reactors, pipes and pumps. Wastewater flows are carefully managed in these systems, and under normal operations all wastewater is directed to the facility's treatment system or to a POTW. In aircraft deicing operations, the chemicals are sprayed outdoors in a comparatively unconfined, usually designated setting, and there is a high likelihood that some pollutants will bypass the treatment system. Setting a minimum collection rate in the proposed rule, based on available technology, will require an airport to reduce significantly its level of uncontrolled discharges in an economically achievable manner.

1. Regulated Facilities

Early in the regulatory development process, EPA focused on deicing activities at primary airports, particularly those with extensive jet traffic. Operators of general aviation aircraft, as well as smaller commercial non-jet aircraft, typically suspend flights during icing conditions, whereas commercial airlines operating at primary airports are much more likely to deice their jets in order to meet customer demands.

Based on the survey results, EPA estimated that 320 primary commercial airports conduct deicing operations. Any effluent guidelines that EPA might develop for these airports must be ''economically achievable'' as required by the CWA, so the Agency proceeded to analyze various industry characteristics that would be an indicator of affordability for the candidate control and treatment technologies. This included a review of the relative sizes of various airports (based on annual departures), the levels of deicing activity, traffic characteristics (*i.e.*, passenger vs. cargo operations), the extent of pollution controls and treatment in place, and the costs of various technologies. EPA further classified airports based on the number of annual jet departures. EPA found that there were some primary airports, typically smaller airports, with high percentages of non-jet traffic, and so it excluded airports with 1,000 or fewer annual jet departures from the scope of the proposed rule. These airports have a higher proportion of propeller-aircraft flights, which are typically delayed or cancelled during icing conditions (*i.e.*, far less deicing takes place at these airports, and far less deicing fluid is used, than at airports serving more jets). The Agency estimated that the remaining 218 largest primary airports account for approximately 85 percent of the deicing fluid used nationally, and including these airports in the scope of today's proposed rule is economically achievable. Moreover, not applying the 1,000 annual jet departure cutoff would only increase the volume of deicing fluid that is within the scope of today's proposed rule by 1 to 2 percent yet would potentially result in high costs to smaller airports that have minimal pollutant contributions. Accordingly, it is appropriate to establish this exclusion because it avoids projected significant adverse economic impacts on this segment of the industry without excluding from the national standards a significant pollutant load.

2. Regulated Pollutants

As described in Section VII.C, EPA identified 21 pollutants of concern that stem directly from airport deicing operations. EPA estimates, however, that many of these pollutants, such as metals, are generally present in airport stormwater discharges irrespective of deicing activities that are taking place. These pollutants would be also present in discharges at airports where no deicing takes place and as such are beyond the scope of today's proposed rule.

EPA determined that pollutants directly associated with aircraft deicing chemicals could be associated with an indicator pollutant. Initially, both COD and BOD_5 were identified as possible indicator parameters. The Agency determined that COD is the best indicator for the following reasons:

- COD captures the oxygen demand from nitrogen and other organic components of the contaminated stormwater that may not be represented in a BOD_5 analytical result.

- Toxic aircraft deicing fluid additive compounds in deicing stormwater may have a negative and variable impact on the acclimation of the active cultures used in BOD_5 analysis, making that method less accurate than a COD analysis.
- COD analyses are simple to conduct and can be measured in real time, compared to the 5-day test required by the BOD_5 analytical method.
- The COD analytical method does not require measurement of the receiving water temperature.

Further discussion of analytical methods is provided in a memorandum, ''Regulation of COD for Airport Deicing Operations'' (DCN AD00845) in the docket for today's proposed rule.

While EPA has an understanding generally of ADF composition—*i.e.,* each product is a glycol-based compound with several additives—deicing fluid manufacturers did not provide us with information on specific ADF formulations. These manufacturers declined several requests to provide information on formulations, citing concerns about confidential business information. EPA has learned about a number of the additives, but not necessarily their concentration, from other sources. Because of incomplete information on these ADF additives, EPA is not proposing numeric effluent limits for any of these additives.

Ammonia is the principal pollutant generated by urea-based pavement deicers, and EPA determined that ammonia is an appropriate indicator pollutant for urea-based airfield pavement deicers.

See the TDD and EIB for further information on regulated pollutants.

3. Technology Options Considered for Basis of Regulation

The effluent limitations that EPA is proposing to establish today are based on well-designed, well-operated collection and treatment systems. Below is a summary of the technology basis for the proposed limitations and the alternative options considered by the Agency. As is the case for any effluent guideline containing numeric effluent limitations, a facility would be able to use any combination of wastewater treatment technologies and pollution prevention strategies at the facility to meet effluent limitations.

a. Subcategorization

EPA may divide a point source category into groupings called ''subcategories'' to provide a method for addressing variations among products, processes, and other factors, which result in distinctly different effluent characteristics. *See Texas Oil & Gas Ass'n.* v. *US EPA,* 161 F.3d 923, 939–40 (5th Cir. 1998). Regulation of a category by subcategories provides that each subcategory has a uniform set of effluent limitations that take into account technological achievability and economic impacts unique to that subcategory. In some cases, effluent limitations within a subcategory may be different based on consideration of these same factors, which are identified in CWA section 304(b)(2)(B). The CWA requires EPA, in developing effluent guidelines, to consider a number of different factors, which are also relevant for subcategorization. The CWA also authorizes EPA to take into account other factors that the Agency deems appropriate.

In developing the proposed rule, EPA considered whether subcategorizing the aviation industry was warranted. EPA evaluated a number of factors and potential subcategorization approaches, including the presence of an on-site glycol reclamation facility, amount of ADF applied, number of departures, availability of land to install collection systems, and FAA airport classifications.

Establishing formal subcategories is not necessary for the Airport Deicing category because the proposed rule is structured to address the relevant factors (*i.e.,* amount of ADF applied and number of departures) and establish a set of requirements that encompasses the range of situations that an airport may encounter during deicing operations. Both the aircraft deicing and pavement deicing requirements include an airport size threshold, which excludes smaller facilities. The use of a performance standard, as compared to a technology specification, provides flexibility for airports in meeting the requirements. EPA is proposing to establish a set of effluent limitations that take into account the factors that EPA determined are relevant for subcategorizing this point source category.

b. Aircraft Deicing

EPA is proposing capture and treatment requirements for spent ADF. EPA is not aware of an available and economically achievable technology that is capable of capturing 100 percent of the spent ADF, and therefore the Agency is focusing on collection technologies and their efficacy.

i. ADF Collection

The available technologies for collecting ADF—glycol recovery vehicles, plug-and-pump equipment, and deicing pads—are described above. EPA evaluated various different combinations of these collection technologies for different-sized airports. See Table VII–2. These various options were developed to represent a wide range of collection requirements and corresponding costs. EPA's objective was to find a combination of requirements that would result in the greatest level of pollutant removals while still being economically achievable.

Specifically, EPA finds that the number of aircraft departures is an appropriate criterion for grouping airports by size and applying different collection requirements to the various size groups. EPA's review of airline and airport deicing practices revealed that the amount of ADF required to deice a single aircraft varies widely. This is primarily due to the type of weather conditions to which an aircraft is exposed, or aircraft size. However, the Agency has concluded that an airport's overall ADF usage level directly correlates to the amount of wastewater generated and pollutant loadings. Because direct ADF usage data were not available for every airport, EPA determined that the annual number of aircraft departures at an airport, considered simultaneously with precipitation data, is a reliable predictor of ADF usage, based on extrapolations of data provided in the questionnaires.

Based on the available technologies, EPA developed four ADF collection options as listed in Table VII–2 below as candidates for identification as best available technology for the collection of ADF.

TABLE VII–2—ADF COLLECTION TECHNOLOGY OPTIONS CONSIDERED FOR BAT

Option	Requirement (applies to primary airports with more than 1,000 annual jet departures)	Estimated airports in scope	Technology basis
1	20% ADF Capture (Airports w/10,000 or more annual departures).	110	Glycol recovery vehicle (GRV).

TABLE VII–2—ADF COLLECTION TECHNOLOGY OPTIONS CONSIDERED FOR BAT—Continued

Option	Requirement (applies to primary airports with more than 1,000 annual jet departures)	Estimated airports in scope	Technology basis
2	40% ADF Capture (Airports w/10,000 or more annual departures).	110	Plug & Pump.
3	60% ADF Capture (Airports w/460,000 gals. or more annual ADF usage and 10,000 or more departures) + 20% ADF Capture (Airports w/10,000 or more annual departures and less than 460,000 gals. annual ADF usage).	110 (14 @ 60% + 96 @ 20%)	Centralized Deicing Pad + GRV.
4	60% ADF Capture (Airports w/460,000 gals. or more ADF usage) + 20% ADF Capture (Airports w/1,000 or more jet departures).	218 (14 @ 60% + 204 @ 20%)	Centralized Deicing Pad + GRV.

Note: All references to ADF are for normalized ADF, which is ADF less any water added by the manufacturer or customer before ADF application.

Not all airports estimated to be in the scope of this proposed rule would incur ADF collection costs under it, because many of these airports already have ADF collection systems in place (Section VIII.C below). For example, of the estimated 14 airports that would have to meet the 60 percent ADF collection requirement in this proposal, seven already have installed deicing pads that would capture at least 60 percent of the ADF.

ii. Treatment

All airports subject to the ADF collection requirement would also be required to treat their ADF wastewater prior to discharge, unless they send this wastewater to a POTW or commercial treatment/recycle facility. EPA examined the four wastewater treatment technologies described above in Section VII.B.2 as candidates for the model BAT technology.

Under this proposal, the collected ADF wastewater would need to be treated to a specified numeric effluent limit for COD. This limit would be based on the long-term averages of effluent from the treatment system identified at BAT (*see* Section VII.E.2 below).

Further discussion of other ADF treatment technologies that EPA considered can be found in the TDD.

c. Airfield Pavement Deicing

In general, airports discharge airfield pavement deicing chemicals without treatment due to the difficulty and expense required in collecting and treating the large volumes of contaminated stormwater generated on paved airfield surfaces. EPA is not aware of an available, economically achievable means for controlling these pollutants through collection and use of a conventional, end-of-pipe treatment system. It may be possible, however, to reduce or eliminate certain pollutants by modifying deicing practices, such as using alternative chemical deicing products. In particular, EPA has identified ammonia as the primary pollutant of concern from airfield deicing, while COD from airfield deicing is also a pollutant of concern, and both of these pollutants are a byproduct of urea-based pavement deicers.

Accordingly, to address discharges of ammonia from airfield pavement, EPA identified one candidate for best available technology, namely, discontinuing the use of urea-based pavement deicers and using alternative pavement deicers instead. EPA researched product substitution for urea-based deicers and found that airfield pavement deicers other than urea are widely available in the market and that these alternate deicers do not produce ammonia. Eighty-nine percent of primary airports currently use airfield pavement deicers that do not contain urea. The most widely used substitute product, potassium acetate, accounts for 64 percent (by weight) of the annual airfield pavement deicer usage in the U.S. Urea stood out as an airfield deicer that was not predominantly used in the industry to begin with. Where it is still used, one of the main reasons for its use appears to be low cost compared to other products. Alternatives to urea are available that are equally effective and safe, and would greatly reduce discharges of ammonia from airfield deicing. These alternative airfield deicers include potassium acetate, sodium formate and sodium acetate. In suggesting these alternative deicers, EPA considered environmental impacts and safety issues. The Agency solicits specific data on those issues. EPA has also determined that the use of substitute airfield deicers would be economically achievable in the industry (*see* Section VIII below).

Discontinuing the use of urea-based deicers would greatly reduce ammonia discharges from airfield runoff, but it would not eliminate them entirely because of the background levels of ammonia present in the general runoff from airfields. One method of ensuring that airports discontinue use of urea-based airfield deicers is to require them to certify that they use an alternative deicer. Alternatively, EPA could set a numeric BAT limit on ammonia based on no use of urea that accounts for the remaining sources of ammonia in airport discharges. Product substitution would also result in significant reductions of COD discharges. *See* the further discussion of this issue in the options selection discussion in the next section below.

E. BAT Options Selection

EPA is proposing to identify Best Available Technology Economically Achievable based on Option 3 in Table VII–2. Specifically, this BAT option has the following three components: collection of ADF sprayed onto aircraft based on either GRV or deicing pads (depending on the amount of ADF used), treatment of the collected ADF, if appropriate, based on anaerobic fluidized bed technology, and certification of non-urea-based airfield pavement deicing.

Under Option 3, all primary airports that have over 1,000 annual jet departures and 10,000 or more annual departures would be required to collect at least 20 percent of all available spent ADF. This collection requirement is based on the estimated performance of glycol recovery vehicles. A subset of this group, those primary airports that have more than 1,000 annual jet departures, 10,000 or more annual departures and use 460,000 or more gallons of normalized ADF annually, would be required to collect at least 60 percent of all available spent ADF. (As defined at proposed § 449.2, normalized ADF is ADF less any water added by the manufacturer or customer before ADF application.) This collection requirement is based on the estimated performance of centralized deicing pads, which are present at 8 of the 14 primary airports currently meeting the departure/annualized ADF usage criteria noted above. Primary airports with less than 10,000 annual departures would not be required to collect or treat their spent deicing fluid.

The proposed rule would reduce pollutant discharges by 44.6 million pounds annually, comprised of 39.9 million pounds of COD (from both ADF and urea reductions) and 4.7 million pounds of ammonia (from urea alone). The proposed BAT requirements for ADF would reduce the aviation industry's discharges of COD associated with ADF by 27.9 million pounds per year. This represents almost a 22 percent reduction in discharges of ADF-correlated COD relative to current practices used by airlines and airports that conduct deicing. Additionally, the proposed BAT requirements for airfield pavement deicing would reduce discharges of COD (from urea deicers) by 12.7 million pounds per year, and reduce discharges of ammonia by 4.7 million pounds per year.

EPA finds that the proposed BAT technologies are generally available to be installed or used by those in the industry. Further, as will be discussed in more detail in Section VIII below, EPA has determined that the proposed BAT technologies are economically achievable. The Agency also examined the non-water quality environmental impacts of the rule and found them to be acceptable. The technology basis for each requirement—ADF collection, treatment of the collected ADF, and non-urea-based airfield pavement deicing—is discussed below.

1. ADF Collection

For each of the four options in Table VII–2, EPA finds that the collection technology is widely available to the industry. *See* the summary of collection technologies used by airports in Table VII–1. EPA finds that for the top fourteen airports in terms of annual ADF usage, collection of ADF based on the use of deicing pads is technologically available. EPA's record indicates that at least seven of the fourteen airports already have installed deicing pads. For the remaining seven, EPA examined what appeared to be the most land-constrained airports and using a formula based on number of departures and number of runways, estimated the amount of land that would be required for installation of deicing pads. EPA then reviewed airport site plans provided in the questionnaires and determined that these constrained airports have sufficient land to install the necessary collection technologies. *See* the TDD for further discussion on the estimated land availability for deicing pads. Therefore, the Agency determined that economic achievability is the controlling factor in identifying which option represents BAT for collection of ADF.

EPA rejected Option 2, Plug-and-Pump technology, as a basis for BAT for ADF collection. Although Plug-and-Pump is estimated to capture 40 percent of spent ADF, as compared to the other options considered, the equipment has comparatively high operating and maintenance costs. In many cases, EPA estimated that Plug-and-Pump costs would be higher than the cost of deicing pads for a comparable airport, yet deicing pads achieve greater pollutant removals than Plug-and-Pump. Overall, Option 2 achieves lower levels of pollutant removals, and it would impose higher costs than Option 3. Therefore, EPA finds that Option 2 is not the best available technology for ADF collection.

Of the remaining options, Options 1 and 3 are economically achievable while Option 4 is not. Therefore, EPA proposes to identify Option 3 as BAT because it achieves the greatest level of pollutant removals among the remaining options and is economically achievable by the industry. The 60 percent ADF capture and treatment standard for the 14 airports at which the largest ADF usage occurs is expected to result in approximately a 70 percent increase in pollutant removals compared to Option 1 (an increase from 26.4 million pounds to 44.6 million pounds of COD and ammonia removals; see Section 13 of the TDD). Thus, EPA projects that Option 3 will result in significantly greater pollutant removals but little increase in the economic impacts of the rule compared to Option 1. Under Option 3, only two additional airports would incur costs beyond Option 1 that would exceed 3 percent of operating revenue. These two airports are among the largest airports in the U.S. and therefore have the greatest ability to take on these additional costs without undue financial burden. See Section VIII below for EPA's analysis of economic achievability.

Although EPA's analysis indicates that airports have sufficient land to install deicing pads, the Agency invites commenters to provide site-specific data and documentation on any space limitations that would affect an airport's ability to install deicing pads, along with recommendations for alternative ADF collection techniques if deicing pads are not feasible.

EPA is also proposing to allow credit for facilities that might adopt new technologies, such as infrared heating, that use less ADF, but may not change the percent of ADF captured. See proposed § 449.20(b)(2)(i)(C).

2. Treatment

The Agency proposes to identify Anaerobic Fluidized Bed (AFB) as the best available treatment technology for reductions of COD. EPA finds this technology to be widely available to the industry. It is currently in use at two hub airports, Albany International (New York) and Akron-Canton Regional (Ohio).

The other three wastewater treatment technologies that EPA considered were less effective at pollutant removal compared to AFB systems. In addition, treating spent ADF with the mechanical methods, UF/RO and MVR/DC results in a concentrated waste stream that also must be disposed of. While these technologies have potential as a part of an airport's pollutant control strategy, they are not as effective as AFB when used as stand-alone treatment options, i.e. the pollutant removals they achieve are not as great as the removals achieved by AFB systems.

The second biological control option, the aerated pond, was not selected as the technology basis for BAT for mainly logistical reasons. The ponds require large areas for installation, and the normal operations of these systems require treatment for many months after the end of the annual deicing season, before the wastewater can be discharged. Additionally, FAA discourages the installation of new stormwater detention ponds at airports, as they can be a lure for migratory birds. In those situations, birds and aircraft are safety hazards to each other. For airports with existing detention ponds, however, where adequate storage capacity is available, aerated pond systems may be able to provide efficient treatment that meets the standard.

EPA has determined that AFB, as the proposed best available treatment technology for reductions of COD, will also achieve significant reductions of many of the other known pollutants associated with ADF, including 97 percent removal of propylene and ethylene glycol. The AFB treatment system removes over 75 percent of many phenol-ethoxylate compounds as well. Moreover, choosing to set a numeric limit on COD provides an approach that is both effective and is relatively easier and more inexpensive for airports to comply with than a numeric limit on glycols, the active ingredient of aircraft deicing fluids, would be. Monitoring costs for COD are modest relative to some other parameters considered by EPA. Permittees may conduct monitoring with the use of portable COD meters, which provide immediate, real-time information on the efficacy of their treatment systems and facilitate timely adjustments of system operation where necessary. Overall, EPA's economic analysis shows that the use of AFB technology for treating spent ADF would be economically achievable in the industry. See Section VIII below for more information on economic achievability.

3. Airfield Pavement Deicers

In addition to the requirements that EPA is proposing for ADF sprayed onto airplanes, EPA is also proposing today to identify BAT for the control of deicers that are applied directly to airfield pavement areas. Specifically, as described in Section VIII.D.3, for airfield pavement deicers, EPA is proposing to identify a BAT of discontinuing use of urea-based pavement deicers in favor of alternative, less toxic products that are not harmful to aircraft. Thus, BAT would be based on product substitution rather than treatment of the wastestream that runs off from airfield pavements. To demonstrate that they have used only non-urea based pavement deicers, permittees would be required to submit a certification to that effect.

EPA considered two possible methods for eliminating discharges of ammonia associated with the application of urea-based pavement deicers. One option would be to set a performance-based numeric limit on discharges of ammonia that could be met by using non-urea-based deicers. A second option would require airports to certify that they do not use urea-based airfield deicing products. EPA is proposing today to adopt the certification option. EPA is proposing the certification because it ensures compliance while minimizing compliance costs. Certification allows a facility to demonstrate compliance with this product substitution-based BAT without the expense of conducting monitoring activities. Collecting and analyzing samples of airfield runoff would also present significant practical difficulties. Measuring ammonia discharges from airfield pavement is generally difficult due to the design of airport drainage systems. Wastestreams from multiple areas of an airport may be combined into a single pipe, which complicates the calculation of pollutant concentrations. In addition, the ''building block'' approach, which has been used to calculate combined wastestream concentrations for other industrial categories, is generally very difficult to perform at airports, due to the variability and unpredictability of the volume of stormwater runoff. Therefore, as a practical matter, a permittee who wanted to take samples and demonstrate compliance with a numeric limit for ammonia would need to show that the ammonia limit is met for all deicing runoff, not just airfield discharges.

While EPA is proposing to identify product substitution as BAT, in order to allow flexibility to regulated facilities, the Agency is also proposing a compliance alternative to the certification requirement. This provision would accommodate facilities that might wish to continue using urea-based deicers and install treatment to eliminate urea-based ammonia discharges instead. Facilities that elect to comply using the compliance alternative would be required to monitor and comply with a proposed ammonia limit. To establish the proposed compliance alternative limitation for ammonia, the Agency had to take into account the ammonia that is a by-product of an AFB wastewater treatment system. This is because AFB discharges could have higher ammonia concentrations than that of background levels found in airfield runoff. While this results in a proposed compliance alternative ammonia effluent limit higher than concentrations in airfield runoff where AFB technologies are not used, the Agency estimates that these concentrations are lower than those from airfield pavement discharges where urea-based deicers are used. *See* ''Evaluation of Proposed Compliance Alternative Ammonia Limitations with Respect to Airport Deicing Stormwater Typical Ammonia Discharges,'' DCN AD01194, for additional discussion.

Although EPA has developed compliance alternative ammonia effluent limitations for this proposal, it estimates that the cost associated with capturing and treating these waste streams would be prohibitively high for most airports. Therefore, EPA anticipates that most or all airports would choose the certification option rather than the ammonia numeric limits option in order to avoid compliance monitoring. EPA requests comment on implementation challenges associated with and the extent to which regulated facilities may select the compliance alternative. To the extent that comments indicate the compliance alternative would not be utilized, EPA might not include it in the final rule.

F. NSPS

EPA evaluated which technologies should be identified as the ''best available demonstrated control technologies'' for purposes of setting new source performance standards under CWA section 306. Among the collection technologies that EPA considered, deicing pads capture the greatest level of available ADF and are widely available in the industry. Among the treatment technologies considered, treatment of the captured ADF with an anaerobic fluidized bed system represents the greatest level of removals of the pollutants of concern and is widely available for use in connection with new airports and new runways at existing airports. In considering economic impacts, EPA believes that a standard based on the use of deicing pads for ADF collection followed by treatment with an AFB system would not represent a barrier to entry for new sources in this industry. See the economic analysis discussion in Section VIII. Accordingly, EPA proposes to base NSPS for aircraft deicing on these technologies. As with the BAT requirement for existing sources, the proposed NSPS would require dischargers to collect 60 percent of available spent ADF, and treat the collected wastewater to a specified numeric limit for COD.

Additionally, EPA considered which technology should be considered the basis for setting NSPS with respect to airfield deicing. EPA determined that, just as with existing sources, all new sources would be capable of eliminating the use of urea for airfield deicing in favor of substitute deicing products. Product substitution represents the greatest level of reduction in ammonia among the available technologies considered and product substitution does not appear to represent a barrier to entry. See the economic analysis discussion in Section VIII. Accordingly, EPA proposes to identify elimination of urea followed by product substitution of non-urea-based airfield deicers as the best demonstrated available control technology for purposes of all new sources.

Based on this identified technology, all new sources would be required to meet the same certification requirement proposed for BAT. In addition, as proposed today for existing sources, EPA proposes the same compliance alternative ammonia effluent limitations for new sources.

For the purpose of this regulation, EPA proposes that a ''New Source'' would include, first, a new airport. The cost of construction of even small airports is significantly greater than the costs associated with collection and/or treatment of spent deicing fluids. Accordingly, meeting the new source requirements proposed today would not be a barrier to entry for them economically. See further discussion in Section VIII below.

In addition, EPA proposes to specify that a new runway at an existing airport is also a new source. EPA anticipates that few new airports will be constructed in the foreseeable future, and that most of the anticipated increase in airport capacity will be accomplished through the expansion of existing airports. The term ''new source'' is defined in EPA regulations at 40 CFR 122.2 and 122.29. EPA proposes to specify in the final rule that a new runway meets the terms of those regulations for being defined as a new source, because in EPA's view a new runway is a ''structure, facility or installation from which there is or may be a discharge of pollutants'' (§§ 122.2 and 122.29(a)(2)) and because a new runway is ''substantially independent of an existing source at the same site'' (§ 122.29(b)(iii)). EPA does not believe in general that new runways will be significantly integrated with existing airport facilities in a way that should prevent them from being identified as new sources (*see* § 122.29(b)(iii)). In addition, it is possible that permit authorities, on a case-by-case basis, would be able to deem other types of construction activity for aircraft movement areas to constitute a new source as well. For example, a permit authority might deem the substantial improvement or replacement of an existing runway to be a new source if that activity is deemed to ''totally replace the process or production equipment that causes the discharge of pollutants'' (*see* § 122.29(b)(ii)). In all of the situations discussed above, the new runway or other runway construction activity would be deemed to be a new source only if it meets all of the criteria in the regulations cited above for definition as a new source.

G. BPT and BCT

The CWA provides for two increasingly stringent levels of technology-based controls on discharges of pollutants. *See EPA* v. *National Crushed Stone Association,* 449 U.S. 64 (1980). BPT represents the first level of control applicable to all pollutants. BCT and BAT represent the second level of control for conventional and toxic/nonconventional pollutants, respectively. EPA considered whether in this rule, it was necessary to establish BPT and BCT limits, given that ADF and pavement deicing fluid will be controlled at the more stringent BAT level. Because the BAT controls in this rule also control the same pollutants as would be controlled by BPT or BCT limits, it is not necessary for EPA to analyze options and propose BPT and BCT effluent limitation guidelines for the Airport Deicing Category. EPA recognizes that it has proposed, in the past, all three levels of control, BPT, BCT and BAT for various industries even where the same pollutants and wastestream were at issue. In this rule however, the Agency solicits comments on this approach because it represents significant resource savings for EPA in terms of analysis and rulemaking process while not sacrificing any environmental protection. Additionally, EPA is not establishing BCT limitations for this industry because these limitations apply only to conventional pollutants such as BOD_5 and total suspended solids and this effluent guideline regulates only non-conventional pollutants (chiefly COD and ammonia).

H. Pretreatment Standards

Some airports in the U.S. discharge ADF-contaminated runoff to POTWs. EPA does not have any information indicating that POTWs currently have problems of pollutant pass-through, interference or sludge contamination stemming from these discharges. For this reason, the Agency is not proposing PSES or PSNS. EPA is aware that high concentration or ''slug'' discharges of deicing wastewater can create POTW upset, and many of the airports that discharge to POTWs have airport-specific requirements on allowable BOD_5 or COD discharge loading per day. They may also have requirements for discharging at various concentration levels over time. Airports usually meet this requirement by storing deicing stormwater in ponds or tanks and metering the discharge to meet the POTW permit requirements.

I. Compliance Costs

1. Overview

EPA estimated industry-wide compliance costs for this proposed rule. This section summarizes EPA's approach for estimating compliance costs, while the TDD provides detailed information on these estimates. All final cost estimates are expressed in terms of 2006 dollars and represent the cost of purchasing and installing equipment and control technologies, annual operating and maintenance costs, and associated monitoring and reporting requirements.

EPA estimated compliance costs associated with today's proposal using data collected through survey responses, site visits, sampling episodes, specific airport requests and information supplied by vendors. As applicable, EPA estimated the costs for an airport to comply with today's proposal initially, as well as maintaining equipment and performing required monitoring or other activities to demonstrate ongoing compliance. These costs may include upgrading/installing and operating a collection system and/or a treatment system, chemical analysis for compliance as well as the costs associated with substituting potassium acetate in place of urea as a chemical airfield deicer. EPA's cost estimates represent the incremental costs for a facility when its existing practices would not lead to compliance with today's proposed rule.

EPA calculated costs based on a computerized design and cost model developed for each of the technology options considered. EPA developed facility-specific costs for each of the Airport industry questionnaire respondents (149 facilities), where each facility was treated as a ''model'' airport. Because the questionnaire respondents represent a subset of the industry, EPA subsequently modeled the national population by adjusting the costs upward to estimate the entire affected airport population.

The questionnaire responses provided EPA with information on three consecutive deicing seasons (2002–2005) for each of the model facilities. Some portions of EPA's costing effort reflect the airports' operations as reported for the three seasons. For example, estimates of applied deicing chemicals were taken as an average of the years for which the information was reported. In instances where aspects of an airport's operation changed over the three-year period, EPA used the most recent information. For example, if an airport installed a deicing pad in 2005, EPA's costing estimates would reflect any incremental changes required above the current ADF collection rate, to meet the collection rate in the proposed rule.

2. Approach for Developing Aircraft Deicing Costs

Under this proposed rule, an airport would be required to collect a percentage of its sprayed ADF, and treat that wastewater to comply with numeric effluent limitations. EPA estimated the costs for an airport to comply with collection and treatment requirements, as well as performing required monitoring to demonstrate compliance. These costs include estimates of upgrading airports' current collection systems, installing the required technology to treat the wastewater, maintaining equipment and conducting chemical analyses for compliance.

EPA first established existing conditions for each model airport based on information and site plans submitted as part of the Airport Questionnaire. EPA then determined what upgrades, if any, would be required to comply with today's proposal. In general, when an airport lacked a comparable collection system to the one used as the basis for the options considered in today's proposal, EPA included costs for installation/implementation of one of the following collection technologies: GRVs, GRVs used in conjunction with plug-and-pump systems, or deicing pads.

For estimating wastewater treatment costs, EPA assumed costs for storage of anticipated volumes of collected ADF. Airport-specific costs were assessed for storage options, including ponds, permanent tanks (both underground and aboveground), or mobile/temporary fractional distillation tanks.

EPA based its selection of a particular storage option on an airport's current storage facilities, and on what would be the easiest for that airport to implement. The Agency assumed that it is likely that an airport with a pond already in place would use that for storage, as opposed to constructing permanent tanks; and assumed that an airport with limited available land would install an underground tank.

Based on questionnaire responses and engineering judgment, EPA assessed the current level of treatment for each model facility that discharges directly to waters of the U.S. Except in limited circumstances, when a model facility was determined to require additional treatment, EPA assigned costs associated with installing an AFB treatment system as the most likely means of compliance.

Of the direct discharging model facilities that were modeled for treatment costs, EPA assumed that approximately five percent would use off-site hauling for waste treatment, based on the Agency's estimate that this percentage will find this choice to be the most cost-effective alternative. These facilities have relatively limited deicing operations and off-site hauling is more cost-effective than installing an on-site biological treatment system. Additionally, an on-site biological treatment system would require a regular wastestream flow in order to keep the biological system functioning properly, and an airport with limited deicing operations may have trouble maintaining a regular wastestream.

EPA recognizes that an airport may decide to use a POTW rather than directly discharging its wastewater. While this may be a lower cost alternative in some cases, EPA did not estimate costs for such a change, because the Agency does not have enough information about the capacity of specific POTWs to receive these volumes of wastewater. EPA also was not able to determine if a specific POTW would be unwilling to accept the wastewater from a particular airport, and for other reasons, such as inconsistencies with its future growth plans. For these reasons, EPA did not include this alternative in its model.

An airport that has upgraded its collection and treatment systems may have additional monitoring costs. While the permit authority determines the required monitoring frequency for an individual permittee, EPA estimated the overall costs of the anticipated monitoring requirements associated with the proposed rule. EPA estimated the cost per airport for the ADF collection requirement, and the cost of analyzing COD in the treated effluent. For costing purposes, EPA assumed that an airport would take a 24-hour composite sample and analyze that for COD, and perform that analysis five times per week throughout the deicing season. EPA made a similar assumption for purposes of computing the proposed weekly average effluent limitation. As a conservative estimate, EPA assumed a six-month deicing season for all modeled facilities. Additionally, EPA assumed that the model facility would perform an assessment of their collection system once every permit cycle.

3. Approach for Estimating Airfield Pavement Deicing Costs

Under today's proposal, in addition to the requirements set forth for capture/treatment of aircraft deicing fluid, an airport would be required to certify it uses non-urea-based airfield deicers. Through the results of the Airport Questionnaire, EPA learned that 29 model facilities (a subset of the 149 model facilities referenced above) use urea for airfield pavement deicing. As detailed in Section VII.D.3, EPA based its certification requirement on product substitution. EPA calculated the cost for these 29 model facilities to substitute the urea used for deicing with another widely available pavement deicer that does not produce ammonia in the wastewater. EPA chose to model the substitution costs on what it would cost to switch to potassium acetate, specifically because that product accounts for 64 percent of the applied chemical airfield deicer usage (by weight) in the U.S.

EPA identified 16 airports that used both urea and potassium acetate for airfield deicing, and 8 of these airports provided usage data. The Agency calculated that the average cost of urea was $274.24/ton and the average cost of potassium acetate was $3.16/gallon. The questionnaire responses indicated that between 2002 and 2005 an average of over 7 million pounds of urea were used annually, costing an estimated $1.06 million.

Urea deicers are applied at a different rate to have an efficacy equivalent to potassium acetate. EPA had to determine what amount of potassium acetate would be required to replace the estimated 7 million pounds of urea used annually. EPA could not locate any information on the relative application rates between potassium acetate and urea directly; however, we did develop a comparison to sodium acetate, another solid pavement deicer. Both urea and potassium acetate application rates vary depending on the weather conditions and the thickness of the ice layer at the time of application. Using the information available, EPA assessed comparable application rates and costs between urea and potassium acetate to treat 1,000 ft^2 of area for thin ice conditions at 32 °F and 1-inch-thick ice conditions at less than 10 °F. DCN AD00843 provides additional details about the calculations on product substitution.

Using the reported urea usage in the Airport Questionnaire, EPA estimated the airfield area that was annually deiced at each model facility. Finally, using the estimated model facility airfield area in conjunction with the estimated $2.32/1,000 ft^2 cost of potassium acetate, EPA was able to calculate the cost per model facility to perform airfield deicing with potassium acetate. This cost was compared to the questionnaire reported urea costs to determine the incremental costs of switching chemical airfield deicers.

4. Calculation of National Costs

EPA categorized all of the costs as either capital costs (one-time costs associated with planning or installation of technologies), or as operations and maintenance (O&M) costs (costs that occur on a regular ongoing basis such as monitoring or annual purchases of deicing materials).

For each model facility, EPA calculated an annualized cost based on the sum of all the associated O&M costs as well as amortized capital costs. Capital costs were amortized over the lifespan of the capital improvement, as reported by the facility. No capital costs were amortized over more than 20 years, even if an estimated lifespan of an airport exceeded 20 years. Finally, EPA combined the amortized costs with the annual O&M to calculate the total annual cost of the regulation for that model facility.

EPA then utilized statistical weights assigned to each of the 149 model facilities in order to calculate a national estimated cost of $91.3 million for complying with the proposed rule. Further discussion of all of the calculations discussed above can be found in the TDD.

J. Approach to Estimating Pollutant Reductions

1. Overview

The pollutants of concern associated with airfield and aircraft deicing and anti-icing chemicals are discussed earlier in this preamble. These chemicals commingle with stormwater and they may be discharged to the environment. These discharges are of environmental concern because the biodegradation of deicing chemicals results in oxygen depletion in the receiving water body. Moreover, some of these pollutants, such as ammonia, have toxic properties. The oxygen demand of compounds can be measured as five-day biochemical oxygen demand (BOD_5) and chemical oxygen demand (COD), or calculated as theoretical oxygen demand (ThOD).

Pollutant loadings from airport deicing operations are challenging to estimate because they are highly variable and airport-specific. Because the use of deicing and anti-icing chemicals is weather dependent, the pollutant loadings at each airport vary based on weather conditions. The pollutant loadings also vary from airport to airport based on each airport's climate. In addition, the amount of applied chemical that is discharged to surface water is airport specific, based on the existing stormwater separation, collection, and/or containment equipment present at each airport.

Due to the variable nature of these pollutant loads, EPA developed an estimation methodology based on the usage of ADF and airfield chemicals at the airports responding to the survey questionnaires. The methodology takes into account EPA's existing data sources and provides a better estimate of the loadings than those based on sporadic monitoring data alone.

2. Sources and Use of Available Data

While developing the pollutant loading models, EPA considered the following data sources:

- Pavement deicing chemical usage/purchase information for the 2002/2003, 2003/2004, and 2004/2005 deicing seasons, as reported by airport authorities in the Airport Deicing Questionnaire;
- ADF purchase information for the 2002/2003, 2003/2004, and 2004/2005 deicing seasons, as reported by air carriers in the Airline Deicing Questionnaire;
- Standard airport information available from the FAA and the Bureau of Transportation Statistics (BTS), including the number of operations and departures by airport;
- Weather information for each airport from National Oceanic and Atmospheric Administration (NOAA), including temperature, freezing precipitation, and snowfall data;
- Existing airport stormwater collection and containment systems, as reported by airport authorities in the Airport Deicing Questionnaire;
- Standard chemical information about ADF and pavement deicing chemicals, including molecular formulas and densities; and
- Analytical data from EPA sampling episodes of airport deicing operations.

a. Baseline Loading Calculations

To estimate pollutant loadings from deicing operations, EPA analyzed airports' questionnaire responses and information provided during the site visits. The Agency estimated the total amount of pavement deicing chemicals and ADF used based on data collected in the Airport and Airline Questionnaires.

In the Airport Questionnaire, EPA requested that airport authorities report the purchase/usage amount, concentration, and brand name of pavement deicing materials. EPA evaluated each reported chemical to determine the most appropriate way to estimate the average amount used over the past three winter seasons. EPA also requested the purchase amount, concentration, and brand names of ADF chemicals in the Airline Questionnaire.

The responses to the Airline Questionnaire provided sufficient data to estimate ADF usage at 56 airports. In some cases, data were not available for every airline operating at a particular airport. In these instances, EPA extrapolated the amount of ADF used by the reporting airlines to estimate the total amount of ADF used by the entire airport. This was done based on the number of airport operations (departures) at the reporting airlines and the total amount of airport operations. In addition to the ADF data reported in the Airline Detailed Questionnaire, 10 airports reported total gallons of ADF usage to EPA in their comment section of the Airport Deicing Questionnaire. These ADF data were combined with the ADF data reported in the Airline Deicing Questionnaires, resulting in estimates of total ADF usage for 66 airports.

Using the Airline and Airport Questionnaire ADF purchase data, airport departure data, and climate data, EPA developed a relationship between the estimate of amount of ADF used, the climate and size of each airport. EPA used this equation to estimate the total gallons of ADF used at airports that did not have available ADF data in the Airport or Airline Questionnaires.

Once the amount of ADF applied at each airport had been determined, EPA needed to determine the amount of ADF available for direct discharge. EPA assumes that 80 percent of applied Type I and Type II ADF falls onto the pavement at the deicing area and is available for discharge. EPA assumes that 10 percent of Type IV ADF falls to the pavement in the deicing area and is available for discharge; the remaining 90 percent adheres to the plane. (See the TDD for more information on these estimates.) The total amount of applied ADF was multiplied by the appropriate percent available for discharge to determine the amount of ADF that is available for discharge. Note that compliance capture requirements in the proposed rule are specified as percentages of ADF available for discharge, not percentages of total ADF applied.

Evaluating the amount of ADF available for discharge, coupled with the estimated baseline collection rate, would result in the total amount of discharged ADF. After excluding the ADF removed via baseline capture, EPA calculated the amount of COD and BOD_5 loading associated with the degradation of the applied deicing/anti-icing chemicals. EPA later decided that COD was a more accurate and practical indicator to regulate than BOD_5 (see the discussion in Section 7 of the Technical Development Document).

Airfield pavement deicing chemicals are applied at various airside areas where differing activities occur. Theoretically, the amount of pavement deicers being discharged could range from approximately zero percent, for chemicals that infiltrate highly permeable soils in unpaved areas during a thaw, to virtually 100 percent for paved areas near storm drains. In general, soil in unpaved areas is frozen during deicing season and is impermeable, promoting the overland flow of stormwater and pollutants to surface waters. Estimating the amount or proportion of pavement deicers discharged at a particular airport is difficult without performing a detailed study at the airport. EPA has not received any such detailed studies, nor other information from airports indicating that pavement deicers are absorbed into soil during the deicing season. Therefore, the Agency assumed for this rulemaking that 100 percent of pavement deicers are discharged to surface waters. This means the estimates of baseline pollutant loadings and removals associated with pavement de-icing are upper bound estimates.

EPA calculated the amount of pollutant loadings discharged to surface waters by using standard published chemical information and stoichiometric equations. This methodology is preferable to using empirical data because it can be applied to all deicing chemicals being used by the aviation industry. In addition, this methodology allows for a clear presentation of the calculations and assumptions used. EPA confirmed the validity of the COD concentrations for propylene glycol and ethylene glycol calculated using this methodology against the available empirical data. See Section 10 of the TDD for more information on calculations of baseline loadings due to airfield deicers.

b. Calculation of Pollutant Removals

EPA estimated the amounts of COD that would be reduced by the proposed rule, by estimating the existing capture and treatment levels at individual airports and comparing that to the levels that would be required by the proposed rule. If a particular airport would be subject to a collection requirement of 20 percent under the proposed rule and it currently is estimated to capture a greater proportion, then no load removals were estimated for that airport. Additionally, if an airport was estimated to use urea for pavement deicing, EPA assumed that the airport would use product substitution to meet the proposed effluent limit. The ammonia and COD loads associated with urea were calculated and then EPA computed the total load reduction by subtracting the ammonia loadings and the COD loadings of the substitute product, potassium acetate. (Although some studies indicate that alternative pavement deicers can be toxic to aquatic organisms, the combined impact of the COD content, toxicity, and nutrient content of urea is greater than effects associated with alternative pavement deicers.)

These calculated loading reductions, for both airfield and aircraft deicing chemicals, were then extrapolated by multiplying the direct discharge loads or load removals by the airport survey weighting factors to determine national loads for the entire industry for baseline and each regulatory scenario. EPA estimates the total annual pollutant removal for the proposed rule at 44.6 million pounds, comprised of 39.9 million pounds of COD and 4.7 million pounds of ammonia. The pollutant removal estimates for the other regulatory options range from 26 million pounds to 46 million pounds.

K. Approach to Determining Long-Term Averages, Variability Factors and Effluent Limitation Guidelines and Standards

This section describes the statistical methodology used to develop the proposed daily maximum and maximum for weekly average effluent limitations for BAT and new source performance standards for COD. EPA also used the same statistical methodology to develop the daily maximum limitation/standard for ammonia that is a proposed compliance alternative when urea is applied to runways. For simplicity, the following discussion uses the term ''limitation'' to refer to effluent limitations, standards, and the compliance alternative. EPA has proposed the same limitations for each level of recovery requirements, because the treatment technology and performance are the same regardless of the amount of fluid recovered.

The following sections describe the data selection criteria; the statistical percentile basis of the proposed limitations; rationales for proposing certain limitations; the calculations; the recommended long-term average value for treatment operations; and the engineering evaluation of the model technology's ability to achieve the levels required by the proposed limitations.

1. Criteria Used To Select Data as the Basis of the Proposed Limitations

Typically, in developing effluent limitations for any industry, EPA qualitatively reviews all the data before selecting a subset as the basis of the limitations. EPA typically uses four criteria to assess the data. One criterion generally requires that the influent and effluent represent only wastewater from the regulated operations (*e.g.,* deicing), and do not include wastewater from other sources (*e.g.,* sanitary wastes). A second criterion typically ensures that the pollutants were present in the influent at sufficient concentrations to evaluate treatment effectiveness. A third criterion generally requires that the facility must have the technology and demonstrate good operation. A fourth criterion typically requires that the data cannot represent periods of treatment upsets or shutdown and start-up periods. (Shutdown periods can result from upset conditions, maintenance, and other atypical operations.)

EPA has adapted the application of the fourth general criterion for data corresponding to start-up periods to reflect some unique characteristics of treating discharges from aircraft deicing operations. Most industries incur start-up conditions only during the adjustment period associated with installing new treatment systems. During this acclimation and optimization process, the concentration values tend to be highly variable with occasional extreme values (high and low). After this initial adjustment period, the systems should operate at steady state for years with relatively low variability around a long-term average. Because start-up conditions reflect one-time operating conditions, EPA generally excludes such data in developing the limitations. In contrast, EPA expects airports to encounter start-up operations at the start of every deicing season because they probably will cease treatment operations during warmer months. Because this adjustment period will occur every year for the Airport Deicing Category, EPA is proposing to include start-up data in the data set used as the basis of the limitations. However, through its application of the other three criteria, EPA would exclude extreme conditions that do not demonstrate the level of control possible with proper operation and control even during start-up periods.

In part, by retaining start-up data for limitations development, the limitations will be achievable because EPA based these limits on typical treatment during the entire season. Once the treatment system reaches steady state, EPA expects a typically well-designed and operated system to run continuously until the end of the deicing season. Conversely, EPA might determine that systems that operated only during relatively short periods, such as during each winter storm event (*i.e.,* of only several days duration), might be poorly operated because the model technology requires more time to reach steady state. In other words, it would be ineffective and disruptive to turn the system on and off throughout the deicing season, particularly for biological systems, such as the model technology, and EPA may reject data if it determines that it reflects this type of operation.

2. Data Used as Basis of Proposed Limitations

Of the effluent data available to EPA, 2,562 concentration values for COD and

5 concentration values for ammonia met the requirements in the criteria and are the basis of the proposed limitations. The concentration values are measurements of effluent collected from Albany Airport's anaerobic treatment system. The 2,562 COD values were collected by the airport during its daily monitoring of COD over ten deicing seasons (*i.e.,* December 1, 1999 through April 10, 2009). The five ammonia values were collected by EPA during its sampling episode (February 5 through February 9, 2006). (As explained in Section VII.E.3, EPA transferred the ammonia data from the anaerobic fluidized bed (AFB) technology because an AFB system by design creates ammonia as a by-product of wastewater treatment. Consequently, AFB discharges could have higher ammonia concentrations than typically found in airfield runoff when urea is not present. If the treated aircraft deicing effluent then were discharged through the same pipe as the runway runoff, the airport might have difficulties complying with the ammonia limitation.)

For the final rule, EPA might further explore factors contributing to variability observed in the available data, assess whether some modes of operations do not reflect the performance expected from the model technology (as required by criterion 3), and thus decide whether to exclude any of the corresponding data as the basis of any limitation.

EPA is soliciting additional data on airport discharges (see Section XIV for a detailed request for data). When applying the data selection criteria for the final limitations, EPA will consider new information from commenters and other sources. Consequently, EPA may reach new conclusions about whether some or all of the proposal data should be included or excluded as the basis of the final limitations; and/or revisions to its statistical approach are appropriate. As a result of its evaluation of the new information, EPA may promulgate final limitations that are more or less stringent than the proposed limitations.

3. Statistical Percentile Basis for Limitations

EPA uses a statistical framework to establish limitations that facilities are capable of complying with at all times. Statistical methods are appropriate for dealing with effluent data because the quality of effluent, even in well-operated systems, is subject to a certain amount of fluctuation or uncertainty. Statistics is the science of dealing with uncertainty in a logical and consistent manner. Statistical methods together with engineering analysis of operating conditions, therefore, provide a logical and consistent framework for analyzing a set of effluent data and determining values from the data that form a reasonable basis for effluent limitations. Using statistical methods, EPA has derived numerical values for its proposed daily maximum limitations and weekly average limitations.

The statistical percentiles are intended, on one hand, to be high enough to accommodate reasonably anticipated variability within control of the facility. The limitations also reflect a level of performance consistent with the CWA requirement that these limitations be based on the best technologies that are properly operated and maintained.

In establishing daily maximum limitations, EPA's objective is to restrict the discharges on a daily basis at a level that is achievable for an airport that targets its treatment system design and operation at the long-term average while allowing for the variability around the long-term average that results from normal operations. This variability means that at certain times airports may discharge at a level that is greater than the long-term average. This variability also means that airports may at other times discharge at a level that is considerably lower than the long-term average. To allow for possibly higher daily discharges, EPA has established the daily maximum limitation at a relatively high level (*i.e.,* the 99th percentile). EPA has consistently used the 99th percentile as the basis of the daily maximum limitation in establishing limitations for numerous industries for many years and numerous courts have upheld EPA's approach.

EPA has not promulgated weekly average limitations for other industries, and thus, is soliciting comment on its approach for this industry. Because EPA typically establishes limitations based upon statistical percentile estimates, it is proposing to do so for the weekly average limitation. In its derivation of the weekly average limitation for COD, EPA used an estimate of the 97th percentile of the weekly averages of the daily measurements. This percentile basis is the midpoint of the percentiles used for the daily maximum limitation (*i.e.,* 99th percentile of the distribution of daily values) and the monthly average limitation (*i.e.,* 95th percentile of the distribution of monthly average values). Courts have upheld EPA's use of these percentiles, and the selection of the 97th percentile is a logical extension of this practice. Compliance with the daily maximum limitation is determined by a single daily value; therefore, EPA considers the 99th percentile to provide a reasonable basis for the daily maximum limitation by providing an allowance for an occasional extreme discharge. Because compliance with the monthly average limitation is based upon more than one daily measurement and averages are less variable than daily discharges, EPA has determined that facilities should be capable of controlling the average of daily discharges to avoid extreme monthly averages above the 95th percentile. In a similar manner to the monthly average limitation, compliance with the weekly average limitation also would be based upon more than one daily measurement. However, the airport would monitor for a shorter time and thus would have fewer opportunities to counterbalance highly concentrated daily discharges with lower ones. For this reason, EPA is proposing and seeks comment on the choice to use a larger percentile for the weekly average limitation than the one used for the monthly average limitation. Consequently, EPA is proposing the 97th percentile as an appropriate basis for limiting average discharges on a weekly basis. EPA also considers this level of control in avoiding extreme weekly average discharges to be possible for airports using the model technology.

4. Rationale for Proposing Limitation on Weekly Averages Instead of Monthly Averages for COD in Effluent Discharges

From a monitoring perspective, EPA considers the weekly average limitation to be a better fit than the monthly average limitation for the circumstances associated with monitoring during the deicing season. In this situation, the weekly average limitation would apply to every week that the treatment system operates during the deicing season.

When it establishes monthly average limitations, EPA's objective is to provide an additional restriction to help ensure that facilities target their treatment systems to achieve the long-term average. The monthly average limitation requires facilities to provide on-going control that complements controls imposed by the daily maximum limitation. To meet the monthly average limitation, a facility must counterbalance a value near the daily maximum limitation with one or more values well below the daily maximum limitation. To achieve compliance, these values must result in a monthly average value at or below the monthly average limitation.

The deicing season is unlikely to start at the beginning of a calendar month and close exactly at the end of a calendar month. This means that the facility would be monitoring at a reduced frequency during those two months. Increasing or decreasing monitoring frequency does not affect the statistical properties of the underlying distribution of the data used to derive the limitations. However, monitoring less frequently theoretically results in average values that are more variable. For example, monthly average values based on 10 monitoring samples per month would be (statistically) expected to include some averages that are numerically larger (as well as some that are numerically smaller) than monthly average values based upon 20 monitoring samples. Because of this reduced monitoring, an airport might have trouble in complying with the monthly average limitation even with an otherwise well-operated and controlled system. In other words, because it was not monitoring as frequently, the airport would have fewer opportunities to counterbalance high concentrations with lower values.

A weekly average limitation preserves EPA's intent for an additional restriction beyond the daily maximum limitation that supports EPA's objective of having airports control their average discharges at the long-term average. EPA is proposing and soliciting comment on use of a weekly average instead of a monthly average limitation because it appears to be a better fit for this industry from a monitoring perspective. However, two factors may warrant another approach in the final rule. First, a week may be too short a period to ensure that airports will optimize their systems appropriately over a longer period to achieve the long-term average. Second, the industry and permit writers are unlikely to have experience with weekly average limitations and may prefer other alternatives. Other approaches may include the monthly average limitation and/or the annual average limitation sometimes used for intermittent dischargers in other industries. For example, for the Pulp, Paper and Paperboard Category (40 CFR Part 430), EPA promulgated an annual average limitation that was set equal to the value of the long-term average derived from the data used to develop the daily maximum and monthly average limitations for continuous dischargers. (It does not have an allowance for variability.) EPA solicits comment on whether weekly average limitations, monthly average limitations or some other approach would be appropriate to ensure that airports have well-operated, maintained, and controlled treatment systems that discharge at a level consistent with the long-term average.

5. Rationale for Proposing a Limitation Only for Daily Discharges of Ammonia in Effluent Discharges

EPA believes that it appropriate to rely on a daily maximum limitation to ensure that airports appropriately control ammonia levels as airports might have difficulties in complying with any average limitation due to monitoring less frequently than assumed in the statistical calculations (see discussion related to monitoring for COD). Unlike COD, EPA is not proposing a weekly ammonia effluent limitation. The technology basis for the COD effluent limitations would operate throughout the deicing season with continuous discharges allowing for weekly monitoring. In contrast, urea is applied to airfield pavement as needed, and discharges would occur for a short time after the initial application, as the urea works its way through the stormwater collection and any associated treatment system that may be present. Most airports would have non-continuous and somewhat infrequent urea discharges. Consequently, it would be difficult to assume a single value for the monitoring frequency that could reasonably be applied to all airports, regardless of climatic conditions. In developing the average limitations, this assumed monitoring frequency is used in the statistical calculations. Although EPA has concerns about establishing average limitations on a national basis, a permit authority may choose to establish weekly or monthly average limitations for a specific airport, and would presumably assume a monitoring frequency based upon local climatic conditions.

Additionally, EPA expects airports to select product substitution (*i.e.,* non-urea deicers) rather than the compliance alternative that requires collection and treatment of runway runoff. Thus, it is possible that no airports will be subject to any limitation on ammonia discharges. For the final rule, after reviewing any supplementary information and comments, EPA may reevaluate whether weekly and/or monthly average limitations are necessary for proper control of ammonia.

6. Calculation of Limitations for COD and Ammonia

For COD, EPA used nonparametric statistical methods to estimate the percentiles used as the basis of the daily maximum and weekly average limitations. A simple nonparametric estimate of a particular percentile (*e.g.,* 99th) of an effluent concentration data set is the observed value that exceeds that percent (*e.g.,* 99) of the observed data points.

For the proposed daily maximum limitation for COD, EPA used the nonparametric method to derive a 99th percentile of the more than 1200 daily measurements for each unit, and then set the proposed limitation equal to the median of the two 99th percentile estimates, or 271 mg/L. The median is, by definition, the midpoint of all available data values ordered (*i.e.,* ranked) from smallest to largest. In this particular case, because there are two units, the median is equal to the arithmetic average (or mean).

For the weekly average limitation of COD, EPA first calculated, for each unit, the arithmetic average of the measurements observed during each week, excluding weekends (to be consistent with the assumed monitoring costs, although permit authorities may specify different monitoring requirements). EPA then used the nonparametric method to derive a 97th percentile of the more than 200 weekly averages for each unit, and set the proposed limitation equal to the median of the two 97th percentile estimates, or 154 mg/L.

For comparison purposes, EPA tentatively estimated 112 mg/L as the 95th percentile of the monthly averages using a statistical model based upon the lognormal distribution. If EPA were to establish a monthly average limitation, it would examine the statistical properties of the data to determine the appropriate model and statistical assumptions.

For ammonia, EPA used a parametric approach in estimating the 99th percentile based upon the data collected during EPA's 4-day sampling episode. The calculations assume the ammonia concentrations can be modeled by a lognormal distribution. EPA's selection of parametric methods, such as the lognormal distribution, in developing limitations for other industries is well documented (*e.g.,* Iron and Steel (40 CFR Part 420), Pulp, Paper and Paperboard (40 CFR Part 430), Metal Products and Machinery (40 CFR Part 438) categories). Variance estimates based upon parametric methods can be adjusted for possible biases in the data. The proposed limitation of 14.7 mg/L includes such an adjustment for possible bias from positive autocorrelation. When data are positively autocorrelated, it means that measurements taken close together in time are more closely interrelated than measurements taken farther apart in time. The adjusted variance then better reflects the underlying variability that would be present if the data were collected over a longer period. For comparison purposes, EPA estimated values of 9.75 and 6.98 mg/L for the weekly average limitation and monthly average limitation.

7. Derivation of Long-Term Average for COD and Ammonia: Target Level for Treatment

Due to routine variability in treated effluent, an airport that discharges consistently at a level near the values of the daily maximum limitation or the weekly average limitation, instead of the long-term average, may experience frequent values exceeding the limitations. For this reason and as noted previously in this section, EPA recommends that airports design and operate the treatment system to achieve the long-term average that it derived for the model technology. Thus, a well-operated and designed system will be capable of complying with the proposed limitations.

For COD, EPA recommends that airports target treatment systems to achieve the long-term average value of 41 mg/L, which is the median of the 50th percentiles, of 37 and 45 mg/L, of the daily values from the two units. The daily allowance for variability, or the ratio of the limitation to the long-term average, is 6.6. (EPA usually refers to this allowance as the ''variability factor.'') In other words, the daily maximum limitation of 271 mg/L is about seven times greater than the long-term average achievable by the model technology. The weekly variability factor is 3.8.

For ammonia, EPA derived its recommended long-term average value of 5.24 mg/L from the (statistical) expected value of the lognormal distribution. The daily maximum limitation of 14.7 mg/L is about three times greater than the long-term average, of 5.24 mg/L, achievable by the ADF treatment model technology. Ammonia is generated as a by-product of the model technology, and EPA expects the concentrations of ammonia to have similar variability to what is being treated (*i.e.*, COD). In contrast to the COD limitations, which are based on a mixture of start-up and steady state periods, the ammonia limitation is based upon data collected only during steady state operations. EPA requests additional data that reflect ammonia discharges during start-up operations.

8. Engineering Review of Proposed Limitations

In conjunction with the statistical methods, EPA performs an engineering review to verify that the limitations are reasonable based upon the design and expected operation of the control technologies and the facility conditions. During the site visit and sampling trip at the Albany treatment plant, EPA confirmed that the airport used the model technologies, specifically AFB. EPA subsequently contacted the plant personnel to obtain more information about the installation and operation of the model technologies. EPA used this engineering information to select the subset of data from which to develop the proposed limitations. In doing so, EPA excluded one extreme value because plant personnel considered it to be atypical, and likely, the result of high solids content. Plant personnel also noted that they had removed and reinstalled the carbon for one unit prior to the last deicing season. Because the performance for the next deicing season was among the best demonstrated for this system EPA concluded that the data with the new carbon characterized variability that operators could expect from periodic maintenance for long-term operation.

As part of this engineering review, EPA concluded that the values of the limitations were consistent with the levels that are achievable by the model technologies. Next EPA compared the value of the proposed limitations to the data values used to calculate the limitations. None of the data selected for ammonia were greater than its proposed daily maximum limitation which supports the engineering and statistical conclusions that the limitation value is appropriate. Because of the statistical methodology used for the COD limitations some values were greater than the proposed limitations. Of the 2,562 data points selected for COD, 27 data points had daily values that were greater than the proposed daily maximum limitation of 271 mg/L. Of the 460 weekly averages, 14 averages had values that were greater than the proposed weekly average limitation of 154 mg/L. Of those 14 averages, 11 were during weeks when the unit also had one or more daily values that were greater than the daily maximum limitation. EPA considered, from an engineering perspective, whether any factors were likely to have led to the larger daily discharges of COD. These factors included deicing season, influent concentrations, and start-up operations. In evaluating the impact of the deicing seasons, EPA concluded that the higher values did not seem to be predominant in any one season. In particular, the higher values occurred one to seven times in each of eight seasons. In evaluating influent concentrations, EPA found that influent concentrations were generally well-controlled into the treatment plant. In general, the treatment systems adequately treated even the extreme influent values, and the high effluent values did not appear to be the result of high influent discharges. In considering start-up operations, EPA noted that the higher values occurred in every month from December through May, except in April, and thus, the limitations appear to provide adequate allowance for start-up operations.

For the final rule, EPA may further assess the range of the operating conditions and resulting performance of the treatment units used at the Albany airport that were the basis of the COD limitation. For example, EPA may contact this airport about the 27 COD values greater than the proposed daily maximum limitation. In the final rule, EPA may consider adjustments (upward or downward) to the limitations to ensure that they adequately reflect normal operations of the model technology. These final limitations may require some dischargers to improve treatment systems and/or operations to meet consistently the effluent limitations. EPA determined that this consequence is consistent with the Clean Water Act statutory framework, which requires that discharge limitations reflect the best available technology.

L. Complying With Regulatory Requirements

1. Compliance Dates

EPA proposes that the compliance date for today's proposed requirements will be 30 days after promulgation. Permits issued after this date will need to include limits consistent with the final rule.

2. Determination of Number of Annual Departures

Airports, in determining whether they are subject to this proposed rule, will need to refer to the number of annual departures over a five-year period prior to submittal of a permit application or NOI. Air traffic controllers tabulate departure data, which are then compiled in the BTS T–100 database (available at *http://transtats.bts.gov*). These data, along with ADF usage data collected pursuant to proposed § 449.20(a), will allow permittees, permit authorities, and the public to easily determine which ADF collection requirements would apply to a particular airport.

3. Alternate Means of Demonstrating Compliance

a. ADF Collection Requirement

EPA is aware that the ADF collection requirement differs from traditional end-of-pipe effluent limitations with regard to a mechanism for demonstrating compliance. Compliance with the collection requirement cannot be determined through end-of-pipe sampling and analysis. Additionally, the amount of ADF available for collection can vary depending on the weather and icing conditions at the time of application. EPA is proposing three procedures for demonstrating compliance with the ADF collection requirement.

The first procedure would require an airport to certify to the permitting authority that it is operating its collection system in accordance with specifications for the applicable technology described at proposed § 449.20(b)(1). The proposed specifications describe operating practices for the technologies. As long as these technologies are operated and maintained as required, the permittee will be deemed in compliance with the associated collection rate. The only reporting requirement for this procedure would be for the permitted facilities to certify to the permit authority that it is operating according to the specifications.

It is not practical for EPA to provide operating specifications for all potential collection technologies. In the instance where an airport wants to perform ADF collection with a technology other than those described in the regulations, under proposed § 449.20(b)(2) the permit authority may consult with the permittee and specify, on a case-by-case basis, an alternative ADF collection technology as the manner in which the permittee must demonstrate compliance with its capture requirement. Under this provision, the Director would also be able to specify alternate operating parameters for one of the technologies listed in the proposed rule, in consultation with the permittee. As part of the permit application, the permittee would be required to demonstrate, to the Permit authority's satisfaction, that the specified technology is designed to achieve the capture requirement as set forth in today's proposal. Again, the only reporting requirement for this scenario would be for the permitted facilities to certify to their permit authorities that they are operating and maintaining their permitted technology as required.

A third procedure, under proposed § 449.20(b)(3), would be for the permitted facility to periodically monitor, through a mass balance analysis or other means deemed acceptable by the permitting authority. The permittee would report, at a frequency determined by the permit authority, the amount of ADF sprayed and the amount of available ADF collected, in order to determine the percentage of available ADF collected.

b. Ammonia Limits

While EPA proposed a non-urea-based airfield deicing certification requirement, it is also proposing that an airport may choose a compliance alternative in which it would monitor all runway outfalls to demonstrate compliance with a proposed alternative compliance ammonia limit. However, as described further in Section VII.E.3, EPA anticipates that most if not all permittees would certify rather than choose the proposed compliance alternative ammonia limitation.

VIII. Economic Analysis for Airports

A. Introduction

EPA's economic analysis assesses the costs and impacts of the proposed effluent guidelines on the regulated industry. This section explains EPA's methodology and the results of its economic analysis. The EA contains more detailed results of this analysis.

B. Economic Data Collection Activities

EPA obtained the following data submitted by airlines to the Bureau of Transportation Statistics (BTS):

- Aircraft departures, enplaned passengers, and cargo by airport of origination, destination, airline, aircraft, and service type (passenger or cargo only) maintained in the Form 41 Traffic Database;
- Air carrier summary traffic and capacity statistics such as available seat-miles, available ton-miles, revenue seat-miles, and revenue ton-miles maintained in the Form 41 Traffic Database;
- Operating revenues, profits, and net income for large certificated carriers maintained in the Form 41 Financial Database;
- Operating revenues, profits, and net income for small certificated and commuter air carriers submitted by airlines to the BTS and maintained in the Form 298c Financial Database. These financial data are confidential business information and cannot made public until three years after the reporting year. EPA obtained them through a special request to the BTS, and they will not be included in the rulemaking public docket.

EPA obtained data on airport revenues, expenses and other financial information that were submitted under FAA's Financial Reporting Program by commercial service airports receiving Airport Improvement Program (AIP) grants. As noted in Section VI above, EPA surveyed: All U.S. primary airports with more than 30,000 annual departures by commercial air carriers; a sample of small hub and non-hub primary airports with fewer than 30,000 commercial air carrier annual departures (excluding Alaska); and selected General Aviation/Cargo airports and Alaskan airports. The Airport Questionnaire collected data on airport ownership, financial management, signatory airlines, sources of capital funding, and non-airline aircraft operations. These data were collected to provide EPA with a context to understand better the data that were obtained through the Financial Reporting Program.

In addition, EPA surveyed a sample of airlines that operated at each of the surveyed airports; all airlines with more than 20,000 annual departures at a surveyed airport received a questionnaire, as well as a sample of airlines with more than 1,000 annual departures at each surveyed airport. The Airline Questionnaire collected data on deicing operations at each airport, including the airline's deicing budget, costs included in the budget, whether the airport is an operational hub for the airline, and whether its aircraft were deiced by another airline or a fixed base operator providing ground services at that airport.

EPA also used journal articles, academic publications, and data and reports from trade organizations, FAA, DOT, and other government agencies and other publications to inform the analysis of the effluent guidelines.

C. Annualized Compliance Cost Estimates

EPA estimates that 218 primary airports that perform deicing operations and have more than 1,000 annual jet departures will be regulated by the proposed rule. EPA estimated the economic cost to each potentially affected airport of complying with the BAT limitations being proposed today using the BAT technologies identified by EPA in this proposal. Thus, EPA assumed that airports would:

- Discontinue urea usage for airfield deicing and use substitute deicing products instead;
- Collect at least 60 percent of applied ADF and treat to the specified numeric discharge limit using anaerobic fluidized bed technology if the airport

has more than 10,000 annual departures, and on average 460,000 or more gallons of ADF is applied annually at the airport;

• Collect at least 20 percent of applied ADF and treat to the specified numeric discharge limit using anaerobic fluidized bed technology if the airport has more than 10,000 annual departures, and on average less than 460,000 gallons of ADF is applied annually at the airport.

Because many airports do not meet the above criteria, EPA estimates that approximately 164 primary airports, 135 non-primary airports, and almost 3,000 general aviation airports are not regulated under the proposed rule.

EPA projects that 70 of the 218 in-scope airports would incur costs under this proposal associated with deicing of aircraft. EPA's assessment of the remaining 148 airports indicates they are already in compliance with the performance standard, and therefore would not incur additional costs because of this proposal. The technologies that are the basis for today's proposal are projected to cost affected airports $714.0 million in total capital costs over the 20-year analytic period. EPA believes the effective service life of deicing pads is at least 20 years, but the effective service life of GRV and plug-and-pump technologies is 10 years. (Plug-and-pump technologies are not part of the proposed option.) Therefore, for any airport modeled using GRV and/or plug-and-pump technologies, EPA incorporated capital expenditures in year 10 for replacement in addition to the initial capital expenditure. The total capital cost figure in Table VIII–1 includes all initial and replacement capital expenditures. However, because the replacement capital expenditures occur 10 years after promulgation, the discounted present value (PV) of those expenditures is less than their current value. Thus, the PV of capital costs is also presented in Table VIII–1 to allow a fair comparison between technologies requiring replacement with those only requiring initial investment over the 20-year analytic period. The PV of capital costs under the proposed option 3 is $701.7 million over the 20-year analytic period.

The annual cost of operating and maintaining the technologies identified as BAT for aircraft deicing for this proposed rule, which includes the cost of using potassium acetate instead of urea to deice airfield pavement, is estimated at $45.9 million. Adding this operation and maintenance cost to the $45.4 million in capital costs of installing deicing pads at the seven airports who are not currently meeting the 60 percent capture requirement, the rule would have a total annualized cost of $91.3 million ($2006). Of the 70 airports projected to incur costs under this proposed rule: 40 airports only incur costs associated with the urea ban, 17 airports only incur costs associated with the collection and treatment of ADF, and 13 airports incur costs associated with both the urea ban and ADF collection and treatment. Table VIII–1 presents projected costs for the proposed rule, as well as the other three options examined (see Section VII.D.3).

TABLE VIII–1—BAT COSTS TO AIRPORTS THAT DEICE AIRCRAFT AND AIRFIELD PAVEMENT

[2006 $ millions—218 airports] [a]

Option	Airports incurring costs	Total capital costs	Present value of capital costs	Annualized capital costs	Annual O&M costs	Total annualized costs
1	67	$311.4	$299.5	$19.2	$17.1	$36.4
2	75	457.8	435.2	28.0	82.1	110.1
3 [b]	70	714.0	701.7	45.4	45.9	91.3
4	121	871.8	848.7	54.9	50.0	105.0

[a] EPA used a discount rate of 5.25% as provided by the airport industry. *See* Section 5 of the Economic Analysis for further information.
[b] Proposed option.

D. Economic Impact Methodologies

EPA's analysis of the economic impacts of the proposed effluent guidelines and new source performance standards for airport deicing operations examined the impacts of the proposed regulations on the economic viability of airports and their customer airlines. We note that there are a number of distinguishing features of this industry that make the analysis here different from the type of more traditional analysis EPA would perform for a for-profit manufacturing industry.

First, almost all potentially affected airports are publicly owned and operated by local, county, or state governments, or by quasi-governmental authorities created to operate the airport. As governmental or quasi-governmental entities, airports do not earn a profit or loss in the traditional financial sense; in fact, many airports have been operated with the expectation that they will break even financially, with airline customers legally required to cover expenditures in excess of costs.

Second, if compliance costs are passed through to airlines serving the affected airports, those airlines would likely determine economic achievability on a route and/or airport basis, as well as how that route/airport fits into the airline's entire route structure. Further, a decision to drop a route at one airport if the route is no longer financially viable may affect the financial viability of connecting routes associated with the same or different airports. However, airline cost and revenue data are only available at the airline level, not on a route-specific basis.

Third, recent years have been financially difficult for the air transportation industry. In aggregate, airlines earned negative operating profit (operating revenues less operating expenses) from 2001 through 2004, and negative net income from 2001 through 2005. A comparison of the expected compliance costs of this proposed regulation with industry profits is not a useful benchmark here (as it usually would be for evaluating the impacts of effluent guidelines on for-profit industries in better financial condition) where many airlines are actually losing money prior to this proposal.

1. Cost Annualization

The first step in projecting the economic and financial impacts of this proposed rule on airports is cost annualization. For each airport, EPA projected the capital and operating and maintenance costs of the technology basis for each ADF target removal percentage over 20 years, discounted future costs using an airport-specific opportunity cost of capital, and annualized those costs to represent 20 equal annual cost payments incurred by the airport. Based on their expected service lives, the capital cost estimates incorporate periodic replacement of

GRVs and plug-and pump-technologies. For the purposes of projecting capital costs, EPA expects both these technologies will require replacement after 10 years, while a deicing pad is expected to last 20 years before requiring replacement. The method for projecting each airport's capital and operating costs is described in Section VII.I.

EPA assumed airports will issue tax-exempt, fixed coupon rate serial General Airport Revenue Bonds (GARBs) to fund capital expenditures. EPA assumed airports will issue bonds equivalent to the net present value of capital costs plus 3 percent to account for bond issuance costs. Capital costs were annualized using each airport's nominal bond rate for its most recent GARB issue. This was converted to a real rate using an average annual inflation rate of 2.3 percent over the last 5 years. The average nominal discount rate for costed airports was 5.25 percent, which is equivalent to 2.87 percent after accounting for inflation. Costs were annualized over 20 years. Table VIII–1 presents the total net present value and annualized value of capital costs as well as the operating and maintenance costs for each option.

2. Impacts

Because airports are generally non-profit government or quasi-government (e.g., port authorities) enterprise funds, the effect of an effluent guideline on airport income statements and balance sheets is not equivalent to the impact on income of a for-profit private-sector business. Therefore, EPA chose to examine the financial impacts of the proposed effluent guidelines using two measures. First, EPA compared airport revenues with annualized compliance costs. Second, because EPA expects many, if not all, airports will fund capital expenditures by issuing debt (GARBs), EPA examined the impact of additional debt on each airport's debt service coverage ratio.

a. Revenue Test

EPA's *Guidelines for Preparing Economic Analyses* (2000) recommends the ''revenue test'' as a measure for impacts of programs that directly affect government and not-for-profit entities. The revenue test compares the annualized compliance costs of the regulation with the revenues of the governmental entity. The guidance suggests evaluating the affordability of a regulatory option as follows:

- If annualized compliance costs are less than 1 percent of revenues, the option is generally considered affordable;
- If annualized compliance costs are greater than 1 percent, but less than 3 percent of revenues, the option may be considered affordable if only a few entities are affected and the majority incurs costs less than one percent of revenues;
- If annualized compliance costs are greater than 3 percent of revenues, the option is not generally considered affordable.

EPA found that only one surveyed airport is privately owned, and because that airport is not a commercial service airport, it would not be within the scope of coverage of today's proposed rule. All other surveyed airports are owned by state, city or county governments, or by airport or multi-port authorities. Thus, use of the revenue test is appropriate to measure impacts to airports. EPA used operating revenues as reported on Form 127 of the FAA's Airport Financial Reporting Program as the denominator for the revenue test ratio, and annualized compliance costs for each option as described under Cost Annualization (*see* Section VIII.D.1) as the numerator for the ratio.

b. Debt Service Coverage Ratio

When creating quasi-governmental agencies such as port authorities, the legislation that created the agency typically includes a lower limit on the authority's debt service coverage ratio (DSCR). Airports owned and operated directly by a state or local government might also have direct limits on airport debt (if the airport has authority independent of the city or county government to incur debt). The authority will be in default on all bond issues if its DSCR falls below the relevant benchmark. Review of Comprehensive Annual Financial Reports (CAFR) for affected airports shows that the ratio of net revenues to debt service for any given year cannot fall below 1.25.

EPA assumed capital financing will occur through the issue of GARBs; this can only be done if the additional debt does not cause the issuer's DSCR to fall below the benchmark. Therefore, EPA estimated the post-regulatory DSCR for each airport incurring capital expenditures under the proposed rule.

From the Airport Questionnaire responses, EPA collected each airport's current DSCR, and the net revenues and debt service used to calculate that ratio. For airports that belonged to multi-airport systems under the same ownership, DSCR was reported at the level of the entire system. Therefore, EPA aggregated compliance costs for all affected airports in the system, and performed a single calculation for the entire system. EPA calculated the post-regulatory DSCR in two ways: (1) Assuming costs are passed through to airlines in the form of higher landing fees, and (2) assuming no costs are passed through. Some evidence suggests airports do not pass through 100 percent of costs, at least in the short run, if there is concern an airline might withdraw service if the airport increases fees. This might occur if the airport has nearby competitors, or if airline finances are fragile. Therefore, EPA wanted to determine if an airport would be in danger of default on its debt even if it was unable to pass through compliance costs to its airline customers.

Assuming 100 percent cost pass-through from airports to airlines, EPA estimated the post-regulatory DSCR by: (1) Adding the net increase in landing fees associated with compliance (that is, total annualized compliance costs less incremental annual deicing operating and maintenance costs) to pre-regulatory airport net revenues, and (2) adding the annualized value of capital compliance costs to the debt service figure. Assuming no cost pass-through from airports to airlines, EPA estimated the post-regulatory DSCR by: (1) Subtracting incremental annual deicing operating and maintenance costs from pre-regulatory airport net revenues, and (2) adding the annualized value of capital compliance costs to the debt service figure.

3. Cost Pass-Through

Historically, most or all airport costs are eventually paid for by airlines and the airlines' customers. Airlines paid airports for operating costs through rates and charges, and for airport capital expansion through aviation user taxes that formed the basis for AIP grants or by providing the revenue stream to finance bond issues. In recent years, airports have developed new revenue streams from concessions, parking, and car rentals. In addition, much capital expenditure is now funded through Passenger Facility Charges (PFCs), although airlines view PFCs as similar to other fees that affect ticket prices, and thus reflect costs passed through to them and their passengers. Although these recent trends have modified airport finance, EPA's overall understanding is still that in the long run, a large percentage of airport costs are passed through to airlines and airline passengers in the form of increased fees.

However, in the short run, cost pass-through (CPT) from airports to airlines might be significantly smaller than 100 percent. For example, due to the severe financial distress experienced by airlines in the wake of 9/11, a Department of Transportation report showed that airports suspended or reduced airline rates and charges, contributed discretionary cash flow to reduce airline charges, and found other means of reducing (or at least refrained from increasing) airport costs to airlines. In addition, airports compete among themselves for airline service. Anecdotally, some airports in relatively close proximity to other significant airports have indicated to EPA that they are reluctant to increase airline rates and charges for fear of losing traffic to competitors.

Although the general economic pressures that affect an airport's ability to pass through costs are well understood, EPA found no studies that have attempted to quantify this relationship. Therefore, to study the range of possible impacts, EPA has chosen to model CPT in the form of three scenarios: the two endpoints of the spectrum (0 percent and 100 percent CPT), and an intermediate scenario of 50 percent CPT.

In addition, airlines pass through costs to passengers in the form of higher ticket prices. The ability of airlines to do this depends largely on market-specific factors such as the desirability of an airport as a final destination, whether the trip to that final destination is for business or pleasure, and whether other airports with acceptable standards of airline service are close to that destination. If an airport serves a highly desirable final destination, with a high percentage of business travel, and no alternative airports nearby, airlines might be able to pass through significant costs to their passengers. However, although studies have measured the intensity of demand for airline services in general, there are very few studies examining airport-specific demand factors.

In addition, the ability of airlines to pass through costs to passengers also depends on the supply of air transportation services. In some respects, airline tickets have become something of a commodity, where passengers largely base their choice on ticket price. This acts to drive prices down to a similar low level. The results of this might be observed in the recent behavior of airlines. With airline fuel costs projected to increase by 50 to 70 percent in 2008, airlines have found it difficult to raise fares, at least in the short run. Announced fare increases by one airline have not been followed by others, forcing the airline raising its fares to return them to their initial level. While airlines have recently started charging or increasing fees for checked bags, phone reservations, and in-flight meals and snacks, these fees are expected to cover only a fraction of increased fuel costs. Thus, it appears that at least in the short run, it is difficult in today's business climate for airlines to pass through a significant percentage of costs to their passengers.

E. Selection, Costs and Impacts of BAT Options

Table VIII–2 summarizes the projected annualized compliance costs and the number and percent of in-scope airports projected to incur compliance costs greater than 3 percent of operating revenues under each option analyzed by EPA.

TABLE VIII–2—SUMMARY OF IMPACTS UNDER ANALYZED OPTIONS

Option	Total annualized compliance costs (2006 $millions)	In-scope airports with projected compliance costs exceeding 3% of operating revenues [a b]	
		Number	Percent
1	$36.4	9	4.2
2	110.1	20	9.2
3 [c]	91.3	11	5.1
4	105.0	58	26.6

[a] Assuming zero percent cost pass-through.
[b] Impacts were not projected for 3 airports under Options 1 through 3, and 5 airports under Option 4. All 5 airports are owned by the Alaska Department of Transportation and Public Facilities. Impacts to these airports could not be projected because the airport owner does not maintain airport-specific revenue figures.
[c] Proposed option.

Under Option 2, airports are projected to incur the largest total annualized costs of all four options examined, yet projected removals of COD are less than under either Option 3 or Option 4 (*see* Section 13 of the TDD). Because Option 2 costs more but would remove fewer pounds of pollutants than either Option 3 or Option 4, EPA eliminated Option 2 as a candidate for selection as best available technology for this ELG.

EPA also rejected Option 4 as a candidate for selection as BAT, because more than one-quarter of in-scope airports (*i.e.,* 59 out of 218 in-scope airports) are projected to incur costs exceeding 3 percent of operating revenue under this option. The difference between Option 3 and Option 4 is that Option 4 would extend the 20 percent ADF capture and treatment rate requirement from primary commercial service airports with more than 10,000 annual departures to primary commercial service airports with more than 1,000 annual departures (*see* Table 4–1 in the EA). Extending the capture requirement would cause 51 small airports with relatively low operating revenues that were not projected to incur costs under Option 3 to incur compliance costs under Option 4. Forty-seven of these 51 airports are projected to incur costs exceeding 3 percent of revenues (*see* Table 5–5 in the EA), which means that these entities would experience a heavy economic burden if required to meet this option, as described above. Based on the large number of airports that EPA projects would experience this heavy economic burden, EPA determined that Option 4 is not economically achievable.

Under Option 3, the proposed regulations would require the 14 airports where average ADF usage has been estimated to exceed 460,000 gallons annually to capture and treat 60 percent of ADF. Airports with greater than 10,000 annual departures but less than 460,000 gallons of ADF usage would be required to meet a 20 percent ADF capture and treatment rate. Under Option 1, the regulations would require all airports with greater than 10,000 annual departures to meet the 20 percent ADF capture and treatment rate. Thus, the difference between Option 1 and Option 3 in projected compliance costs, economic impacts, and pollutant removals is entirely attributable to the stricter standard for the 14 airports with the largest ADF usage; this stricter standard would add a projected $54.9 million in annualized compliance costs to the rule.

EPA determined that both options are economically achievable. The 9 airports projected to incur costs exceeding 3 percent of operating revenues under Option 1 would incur identical impacts under Option 3. Due to the 60 percent ADF capture and treatment standard, two additional airports are projected to incur costs exceeding 3 percent of operating revenues under Option 3 (*see* Table 5–5 in the EA). However, as discussed in Section 2.6 of the EA, very large airports such as these have significantly better access to financial resources than smaller airports and serve more passengers and aircraft. Thus, they are less vulnerable to a potential loss of service in response to increased rates and charges and earn higher revenue flows. Consequently, EPA believes these airports will be less affected than smaller airports by compliance costs that comprise a similar percentage of revenues. In addition, both of these airports are currently undergoing significant capital expansion and improvement programs; as part of these programs both airports are installing deicing pads, however EPA's costing assumed no deicing pads. Although EPA does not have sufficient information to determine if these pads will enable the airports to meet the 60 percent capture and treatment target without further capital expenditure, their installation should decrease the incremental costs necessary to reach that standard relative to those estimated for our analysis.

Airports with less than 10,000 total annual departures have been excluded from ADF collection and treatment requirements based on possible economic achievability concerns. EPA's analysis shows that approximately 46 percent of the next approximately 100 airports (in terms of ADF usage) would incur costs of greater than 3 percent of their revenue if required to comply with these additional requirements. Moreover, airports with less than 10,000 annual departures are smaller airports and may have greater difficulty raising funds to meet these ADF requirements. For these reasons, we have decided to exclude airports with less than 10,000 total annual departures from the ADF collection and treatment requirements of this proposed rule.

As a check on whether Option 3 is the best combination of technologies to be selected as BAT, EPA also examined whether there might be an additional option that would result in more removals than Option 3 (but less than Option 4) while still being economically achievable. Option 3 would impose a 60 percent capture requirement on the 14 airports that are the largest by ADF usage. EPA therefore considered whether the 60 percent requirement could be extended to additional airports beyond the top 14 (*i.e.,* extended to airports with somewhat less ADF usage) without going beyond the limits of economic achievability. EPA reviewed the projected costs of installing deicing pads at airports with less than 460,000 gallons of annual ADF usage as well as those airports' operating revenues. From this review, EPA concluded that the set of airports immediately following the ''top 14'' by ADF usage would incur significantly greater economic impacts relative to their resources than would the top 14 airports. Specifically, of those airports that would incur costs under today's proposal, 5 of the first 6 airports that immediately follow the top 14 by ADF usage would be projected to incur costs greater than 3 percent of revenues and therefore would incur a heavy economic burden. In addition, 29 of the 57 airports in all that follow the top 14 by ADF usage would be projected to incur costs over 3 percent of revenues. This confirms, in EPA's view, that imposing the 60 percent requirement on only the top 14 airports under Option 3 is the appropriate cutoff point for determining economic achievability for this industry. Moreover, these additional airports, if subjected to a 60 percent capture requirement, would be expected to achieve few additional pounds of pollutant removals relative to Option 3. This additional analysis confirms EPA's proposal to identify the Option 3 technologies as the BAT basis for this effluent limitation guideline. *See* ''Regulatory Option Development for the Airport Deicing Operations Rulemaking Proposal'' (DCN AD01168) in the docket for additional information.

Tables VIII–3 through VIII–5 below present more detailed estimated costs and impacts of the options that EPA considered for BAT.

Table VIII–3 presents the results of the revenue test for affected airports. Under Option 3, 174 of 218 in-scope airports (80 percent) are projected to incur zero annualized compliance costs or annualized compliance costs composing less than 1 percent of revenues. Of the remainder, 11 (5 percent) are projected to incur costs exceeding 3 percent of revenues, and 29 (13 percent) are projected to incur costs exceeding 1 percent, but less than 3 percent of revenues.

TABLE VIII–3—FINANCIAL IMPACTS OF BAT OPTIONS ON AIRPORTS THAT DEICE

[2006 $ millions—218 airports]

Option	Total annualized costs	Number of airports with ratio of annualized compliance costs to operating revenues of: [a]			
		Less than 1%	Between 1% and 3%	Greater than 3%	Not analyzed [b]
1	$36.4	178	27	9	3
2	110.1	165	30	20	3
3 [c]	91.3	174	29	11	3
4	105.0	130	25	58	5

[a] Number of airports may not sum to 218 due to rounding.
[b] Airports incurred compliance costs but financial impacts could not be analyzed due to lack of airport revenue data.
[c] Proposed option.

Tables VIII–4 and VIII–5 present the projected impact of the rule on the ability of the airports to finance their debt. To complete this analysis, EPA first had to distinguish multiple airport owners from single airport owners. Multiple airport owners might incur costs for several airports, and debt is typically held at the ownership level, not at the level of the individual airports. EPA used question B–4 of the Airport Deicing Questionnaire to identify all multiple airport owners, and how many airports under that ownership received a survey.

EPA found 10 airport owners received surveys for 31 airports; of these, 9 airport owners received surveys for 21 airports that were determined to be in-scope of the proposed regulation. All results for multiple airport owners are presented unweighted because each airport was individually identified and therefore does not represent any other airports but itself with respect to ownership. EPA aggregated projected costs for all in-scope airports under that ownership pattern and analyzed them using the owning organization's debt service coverage ratio obtained from the Comprehensive Annual Financial Report. The remaining 93 (unweighted) in-scope airports were evaluated individually as single-owner airports. Although EPA did not stratify the survey based on ownership, and therefore the survey weights cannot be considered statistically reliable for determining the count of single-owner airports, the weights generally reflect the relative frequency of single airport ownership. EPA presents both the weighted and unweighted results for this group of airports.

Some airports did not provide sufficient data to analyze impacts on the DSCR. This could occur because: (1) The airport does not use debt to finance capital projects, (2) data were not provided through the survey or the airport's annual financial report, or (3) data are available but the pre-regulatory DSCR is less than 1.25. For single-owner airports, the impact on DSCR could be projected for all airports expected to incur capital costs under the proposed option. Among multi-airport owners, the impact on DSCR could be projected for all except one airport owner that was expected to incur capital costs for three airports under the proposed option. This airport owner is described in greater detail below.

Table VIII–4 presents the projected impact of the rule on the ability of single airport owners to finance their debt. Assuming no costs are passed through to their air carrier customers, two airports are projected to incur costs under the proposed rule that would result in their post-regulatory debt service ratio falling below the threshold that indicates default. However, one of these airports installed a deicing pad after the survey was submitted, and therefore would incur lower compliance costs than projected here. Under the proposed rule, no single airport owners are projected to be in danger of default when 100 percent of compliance costs are assumed to be passed through to airline customers.

TABLE VIII–4—IMPACT OF FINANCING BAT OPTIONS ON AIRPORT DEBT SERVICE COVERAGE RATIO—SINGLE AIRPORT OWNERS

[192 airports]

Option	Incur costs	Not analyzed[a]	Owners with pre-regulatory DSCR >1.25 & post regulatory DSCR <1.25	
			100% CPT	0% CPT
1	54	6	0	3
2	62	6	1	7
3[b]	55	6	0	3
4	99	42	0	3

[a] Of the 218 airports (weighted), 192 were estimated to be both in-scope, and the only airport controlled by its ownership. These columns represent the number of those 192 airports projected to incur costs under each option, and of those airports incurring costs, the number that cannot be analyzed due to lack of sufficient data.

[b] Proposed option.

Table VIII–5 presents the projected impact of the rule on the ability of the owner to finance debt for the 6 multi-airport systems that own the 13 airports projected to incur costs under the proposed rule. For the 5 airport systems owning the 10 airports projected to incur costs for which the DSCR analysis could be performed, none of the four options considered for the proposed rule are projected to have an impact on the ability of airport authorities to finance debt.

EPA could not analyze one multi-airport system, which is responsible for five airports projected to incur costs under at least one option. This is the Rural Aviation System of the Alaska Department of Transportation and Public Facilities, which owns 256 rural airports. EPA projects that three of those airports would be affected by the proposed rule. The Alaska Rural Aviation system does not use debt financing; therefore, it has no DSCR to analyze. Instead, it relies on state and federal grants to fund capital expenditures.

TABLE VIII–5—IMPACT OF FINANCING BAT OPTIONS ON AIRPORT DEBT SERVICE COVERAGE RATIO—MULTI AIRPORT OWNERS

[9 airport authorities owning 21 in-scope airports][a]

Option	Incur costs[b]		Not analyzed[b]		Owners with pre-regulatory DSCR >1.25 & post regulatory DSCR <1.25	
	Owners	Airports	Owners	Airports	100% CPT	0% CPT
1	5	11	1	3	0	0
2	5	11	1	3	0	0
3[c]	6	13	1	3	0	0

TABLE VIII–5—IMPACT OF FINANCING BAT OPTIONS ON AIRPORT DEBT SERVICE COVERAGE RATIO—MULTI AIRPORT OWNERS—Continued

[9 airport authorities owning 21 in-scope airports] [a]

Option	Incur costs [b]		Not analyzed [b]		Owners with pre-regulatory DSCR >1.25 & post regulatory DSCR <1.25	
	Owners	Airports	Owners	Airports	100% CPT	0% CPT
4	6	16	1	5	0	0

[a] Because these airports and their ownership were individually identified, the results cannot be assumed to represent any airport owners other than themselves. Therefore, these results are not weighted.

[b] Of 114 surveyed airports (unweighted), 21 (unweighted) under the control of 9 distinct ownership authorities were determined to be in-scope of the proposed rule. These columns represent the number of those airports and the number of airport ownership authorities projected to incur costs under each option, and of those airports incurring costs, the number that cannot be analyzed due to lack of sufficient data.

[c] Proposed option.

In light of the foregoing analysis, EPA does not believe that the projected impacts of the rule on the ability of airports to finance their debt are significant enough to change our proposed findings on which BAT options are economically achievable.

F. Economic Impacts for New Sources

As explained in Section VII.F above, EPA has determined that the proposed NSPS would not impose a barrier to entry, in both the new runway and new airport scenarios. The costs for a centralized deicing pad are estimated at ten percent or less of the total cost for a new runway, and this proportion is even smaller when compared to the cost of building a new airport. An analysis of these costs is contained in the record for today's proposal.

G. Cost and Pollutant Reduction Comparisons

EPA compared the projected compliance costs for the proposed rule with the estimated reduction in pollutants resulting from the effluent guidelines. Table VIII–6 presents projected compliance costs and estimated pounds of COD and ammonia removed from airport stormwater under the proposed rule. Option 3 is expected to reduce COD and ammonia loads by 45.2 million pounds at an annualized cost of $91.3 million, for a cost of $2.02 per pound of pollutant removed.

TABLE VIII–6—POLLUTANT REMOVALS, COSTS AND COST-EFFECTIVENESS OF BAT OPTIONS FOR AIRPORTS THAT DEICE

Option	Total pollutant removals (million lb)	Total annualized costs (2006 $ mil.)	Cost/lb pollutant removed
1	26.6	$36.4	$1.37
2	36.6	110.1	3.01
3 [a]	45.2	91.3	2.02
4	47.4	105.0	2.22

[a] Proposed option.

EPA has reviewed the relative cost per pound of pollutants removed in previous effluent guidelines and has found that the cost per pound presented in today's proposal is similar or less expensive than many guidelines promulgated to date including: Aluminum Forming, $2.42/Lb; Landfills, $15.00/Lb and; Waste Combustors, $38.83/Lb.

H. Small Business Analysis

The Regulatory Flexibility Act (RFA), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; hereinafter referred to as RFA), acknowledges that small entities have limited resources, and makes it the responsibility of regulating federal agencies to avoid burdening such entities unnecessarily. The ultimate goal of RFA is to ensure that small entities do not incur disproportionate adverse economic impacts as a result of a regulation. The first step in this process is to determine the number and type of small entities potentially affected by the regulation.

The RFA (5 U.S.C. 601) defines three types of small entities: small business, small not-for-profit organization, and small governmental jurisdictions. To determine airport ownership, EPA examined FAA Airport Data (Form 5010) and the Contact Information data file for National Flight Data Center (NFDC) facilities, which list the owner of each airport. EPA matched all 153 surveyed airports (representing 359 airports, both in-scope and out-of-scope) to their owners and determined that with the exception of one privately owned airport, ownership is composed of states, county, city governments, and single and multi-purpose port authorities. Single and multi-purpose port authorities are quasi-governmental agencies created by governmental legislation to maintain and operate airports, shipping ports, and other government-owned facilities such as bridges.

The RFA defines a small government entity as governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than 50,000. After matching each airport-owning governmental entity with its population, EPA estimates that:

• 16 surveyed airports representing 76 airports are owned by small government entities

• 8 surveyed airports representing 34 airports owned by small government entities are in the scope of the proposed rule.

Although many Alaskan airports are relatively small when measured by service level, most of these airports are owned by the State of Alaska and therefore are not considered small for the purposes of the RFA; 10 of the 11 surveyed Alaskan airports are not small by this standard.

EPA projected impacts on these small government entities that own airports using the revenue test described in Section VIII.D.2. EPA found that 3 of the 34 in-scope airports owned by small government entities are expected to incur annualized compliance costs exceeding three percent of airport operating revenues. These results are presented in Table VIII–7.

TABLE VIII–7—FINANCIAL IMPACTS OF BPT/BAT OPTIONS ON SMALL AIRPORTS THAT DEICE [a]

[2006 $ millions—34 airports]

Option	Total annualized costs	Number of airports with ratio of annualized compliance costs to operating revenues of:			
		Less than 1%	Between 1% and 3%	Greater than 3%	Not analyzed [b]
1	$1.8	23	8	3	0
2	4.8	23	8	3	0
3 [c]	1.8	23	8	3	0
4	3.0	23	0	11	0

[a] An airport is considered small if the governmental entity that owns the airport serves a region with less than 50,000 people.
[b] Airports incurred compliance costs but financial impacts could not be analyzed due to lack of airport revenue data.
[c] Proposed option.

As privately owned, for-profit businesses, air carriers are subject to the small business definitions set forth by the Small Business Administration's size standards. For EPA's purposes, the size standards for the North American Industrial Classification System (NAICS) Scheduled Passenger and Freight Air Transportation (NAICS 481111 and 481112) sectors are appropriate for determining potentially affected small airlines. Thus, air carriers with fewer than 1,500 employees will be considered small for the purposes of this analysis.

Available employment data for air carriers are provided by the BTS in their Employment Statistics—Certificated Carriers report. This data set does not contain records for all affected air carriers. For some air carriers with missing data, EPA obtained employment figures from annual reports or the annual report of the Regional Airline Association. For the remaining carriers, EPA compared their departure and enplanement data to the same data for air carriers with employment data. EPA determined that annual departures could be used as a suitable proxy for size. Using BTS T–100 data, EPA found 139 U.S. air carriers had at least one departure from an in-scope airport in 2006. Based on employment, or annual departures for air carriers without employment data, EPA estimates that of these 139 U.S. air carriers operating from in-scope airports in 2006, 36 are not small (27.5 percent) and 103 (72.5 percent) are small business owned.

IX. Airline Impacts

The economic and operational structure of airport deicing differs significantly from most industries for which EPA has promulgated effluent limitations and guidelines. For most industries, EPA evaluates direct impacts to affected entities, and only secondarily considers impacts on those entities' suppliers and customers. In the case of airport deicing, the airport is typically the holder of the NPDES permit and thus responsible for collection and treatment of ADF-contaminated stormwater; air carriers that use the airport are occasionally co-permittees, but never the principal permittee at the airport. However, the air carrier (or a contractor to the air carrier such as another airline or an FBO) is the entity that uses the ADF at the airport under rigorous safety guidelines set by the FAA. Furthermore, in the long run, air carriers (and their passengers) pay for much of the airport's infrastructure and operating expenses. Therefore, EPA has chosen to evaluate these secondary impacts of the proposed regulation on air carriers in addition to airports.

EPA examined impacts to airlines with compliance costs passed through from airports in the form of higher landing fees. EPA compared compliance costs with airline operating revenues (''sales test''); this test was supplemented with a comparison of compliance costs with operating profit and net income for those airlines with positive earnings. EPA also analyzed the impact of costs relative to common air carrier benchmarks for unit measures of cost and capacity such as cost per available seat-mile. EPA examined impacts of the preferred option on airline operating revenue between 2004 and 2006. Only in 2005, and for only one airline out of roughly 120 during that period were compliance costs greater than three percent of operating revenue. EPA does not believe that these impacts are significant enough to change our findings on which BAT options are economically achievable. For a more detailed discussion of these impacts, see Sections 3.3 and 5.3, respectively, of the EA.

X. Environmental Assessment

A. Environmental Impacts

EPA has evaluated environmental impacts associated with the discharge of wastewater from airport deicing activities (Environmental Impact and Benefit Assessment for Proposed Effluent Guidelines and Standards for the Airport Deicing Category (EIB)). As discussed in Section VII.E, deicing wastewater discharges can increase the loadings of multiple pollutants to receiving surface waters.

The most widely recognized pollutant from deicing activity is oxygen-demanding material, measured as either COD or BOD_5. All primary ingredients in both aircraft and airfield deicers exert oxygen demand. Propylene glycol and ethylene glycol are the primary ingredients in aircraft deicers. Acetate salts, formate salts, propylene glycol, ethylene glycol and urea are the primary ingredients in airfield deicers. Propylene glycol and ethylene glycol, in particular, exert extremely high levels of oxygen demand when they decay in the environment. Acetates, formates, and urea exert lower, though still significant, levels of oxygen demand.

Acetate or formate salts, the primary ingredients in many airfield deicers, also contain potassium or sodium. Potassium and sodium can raise overall salinity levels or cause ion imbalances in surface waters. Urea, another primary airfield deicer ingredient, decomposes in water to produce ammonia, a toxic compound, and nitrates, a nutrient pollutant that can increase the incidence of organism blooms in surface waters.

Aircraft and airfield deicers also contain additives in addition to the primary ingredients. These additives serve a variety of purposes such as reducing fluid surface tension, thickening, and fire and corrosion inhibition. Because deicer manufacturers consider the identity and quantity of additives in their formulations to be proprietary information, EPA was unable to obtain complete information on the nature and use of these additives.

EPA was able to obtain some limited information through various public sources, and identified several additives with toxic properties. These include nonylphenol ethoxylates, alcohol ethoxylates, triazoles, and polyacrylic acid. Because deicer formulations change periodically, some of the additives EPA identified may not be present in current formulations. Nevertheless, the properties of the additives EPA identified may be indicative of deicer additive properties in general. EPA solicits additional information on the identity of deicer ingredients, and on the quantities in which they are used in current formulations. EPA also solicits information about potential environmental impacts associated with ingredients in deicer formulations.

Airports in the United States discharge deicing wastewater to a wide variety of waterbody types including streams, rivers, lakes and estuaries. Many airports discharge deicing wastewater to small streams with limited waste dilution and assimilation capacities. Impacts from deicing wastewater discharges have been documented in a variety of surface waters adjacent to or downstream of a number of airports in the United States. Some locations experienced acute impact events, whereas other locations have chronically degraded conditions. Observed impacts to surface waters include both physical and biological impacts. Some surface waters have been listed as impaired under section 303(d) of the CWA because they do not meet applicable state water quality standards. Physical impacts include elevated levels of glycol, salinity, ammonia, and other pollutants; depressed oxygen levels; foaming; noxious odors; and discoloration. Biological impacts include reduced organism abundance; fish kills; modified community composition; and reduced species diversity.

Deicing wastewater discharges have impaired both aquatic community health and human uses of water resources. Available documentation indicates multiple cases of hypoxic conditions and severe reduction in aquatic organism levels in surface waters downstream of deicing wastewater discharge locations. Documented human use impacts include contamination of surface drinking water sources, contamination of groundwater drinking water sources, degraded surface water aesthetics due to noxious odors and discolored water in residential areas and parklands, and degradation of fisheries.

B. Environmental Benefits

EPA has evaluated environmental benefits associated with regulatory proposals to reduce the discharge of pollutants from airport deicing activities. This assessment is described in detail in the EIB. The proposed BAT requirement would decrease COD discharges associated with airport deicing activities by approximately 39.9 million pounds per year. The proposed BAT requirement would also reduce ammonia discharges by 4.7 million pounds. The proposed rule would also reduce loadings of additives in aircraft deicer formulations to the environment.

EPA estimates that a reduction in pollutant loadings will take place at approximately 70 airports around the country. The decline in pollutant loadings will reduce environmental impacts to surface waters adjacent to and downstream of these airports. A variety of surface waters have improved in quality after reductions in deicing pollutant loadings. Documented improvements have included abatement of noxious odors, decline in fish kill frequency, and partial recovery of community species diversity, and organism abundance in small water bodies.

Today's proposed rule would decrease pollutant loadings to multiple surface waters currently listed as impaired under sec. 303(d). The proposal will also reduce pollutant loadings to surface drinking water intakes, parks, and residential areas downstream of airports. Groundwater aquifers will also benefit. *See* the EIB for additional details.

XI. Non-Water Quality Environmental Impacts

Sections 304(b) and 306 of the Clean Water Act require EPA to consider non-water-quality environmental impacts (including energy requirements) associated with effluent limitations guidelines and standards. To comply with these requirements, EPA considered the potential impact of the collection and treatment technologies on energy consumption, air emissions, and solid waste generation. EPA prepared these analyses only for technologies associated with the BAT and NSPS requirements.

A. Energy Requirements

Net energy consumption considers electrical requirements for pumping collected fluid from centralized deicing pads, and electrical requirements for operating the anaerobic fluidized bed (AFB) bioreactors and the aerated ponds and fuel requirements for glycol recovery vehicles (GRVs). Detailed calculations regarding net energy consumption for the collection and treatment technologies are provided in a separate memorandum entitled ''Energy Requirements for ADF Contaminated Stormwater Collection and Treatment Alternatives'' (DCN AD011167), available in the public record for this rule.

To estimate incremental electrical requirements associated with pumping collected ADF to either tanks or ponds, EPA assumed airports would continuously operate three 40-horsepower (hp) electric motors during each deicing day. EPA also conservatively assumed that all airports would use pumps rather than allow ADF-impacted stormwater to flow by gravity to holding tanks or ponds. Using that assumption, EPA estimated the total incremental electrical usage associated with the proposed rule would be approximately 1.2 million kilowatt hours per year (kWh/yr).

EPA developed another relationship between electrical use and chemical oxygen demand (COD) removal by the AFB bioreactors based on information provided by Albany International Airport. Using the information from Albany Airport, EPA estimated the electrical requirement for COD removal and used that rate to estimate electrical usage associated with COD removal.

The AFB treatment systems also generate biogas that can be used as a source of heat when burned in facility boilers or when converted to electricity using technologies such as microturbines or fuel cells. To estimate the potential electricity that could be generated if all AFB treatment systems installed microturbines to generate electricity, EPA developed a relationship between biogas generation and COD removal based on data provided by Albany Airport. EPA used these data to determine the potential energy of the associated biogas.

The comparison of the potential electrical generation from converting biogas to electricity to the electrical requirements for AFB operation indicates that treatment of ADF-contaminated stormwater could generate nearly the same amount of electricity that is needed to operate the treatment systems. Based on this analysis, there will not be a net increase in electricity to operate the collection and treatment systems for ADF-contaminated stormwater.

EPA also analyzed fuel use by GRVs collecting ADF-contaminated stormwater. EPA used Airport Questionnaire data for diesel fuel costs for GRVs, and then estimated an average diesel fuel use based on the unit cost for diesel fuel of $2.07/gal.[1] EPA then estimated annual fuel usage per gallon of applied ADF to be 0.08 gal/gal ADF applied. Using this relationship, EPA estimated total incremental No. 2 diesel fuel consumption at all in-scope airports installing additional collection equipment to be 604,000 gallons per year.

EPA compared incremental diesel fuel use by GRVs at all airports to diesel fuel use on a national basis. Approximately 25.4 million gallons per day of No. 2 diesel fuel was consumed in the United States in 2005. The diesel fuel requirement associated with this proposed rule is less than 0.005 percent of the annual amount of diesel fuel consumed.

B. Air Emissions

Additional air emissions as a result of the proposed rule could be attributed to added diesel fuel combustion by GRVs collecting ADF-contaminated stormwater, from additional jet engine taxi time related to deicing pads, and from anaerobic treatment of ADF. Emissions from these sources are discussed below.

1. Emissions From GRV Collection

As discussed in Section XI.A above, EPA conservatively estimated that GRVs collecting ADF-contaminated stormwater at airports will consume an additional 604,000 gallons per year of No. 2 diesel fuel. To estimate air emissions related to combustion of No. 2 diesel fuel in the internal combustion engines on GRVs, EPA used published emission factors for internal combustion engines. The Agency selected emission factors for gasoline and diesel industrial engines because EPA assumed this class to be a more representative population of engines. To estimate emissions from the GRVs, EPA first converted the additional 604,000 gallons of diesel fuel to million British Thermal Units (MMBtu) and then applied the appropriate emission factors. The calculated annual emissions indicate that an additional 4,781 tons per year of carbon dioxide (CO_2) will be emitted from GRVs combusting additional diesel fuel to comply with the proposed rule. Carbon dioxide is the primary greenhouse gas attributed to climate change, and the 6,900 additional tons per year that would be associated with the proposed rule is very small relative to other sources. For example, in 2006, industrial facilities combusting fossil fuels emitted 948 million tons of CO_2 equivalents. An additional 6,900 tons per year from GRVs is less than a 0.001 percent increase in the overall CO_2 emissions from all industrial sources.

2. Emissions From Transportation to Aircraft Deicing Pads

To estimate aircraft emissions associated with the additional time spent taxiing to and from newly installed deicing pad and idling during deicing, EPA used the seven busiest airports where deicing pads would likely be installed to comply with the proposed rule. To estimate aircraft emissions for each airport from transportation to newly installed deicing pads, input files such as departure information, types of aircraft being deiced, and deicing days were compiled and applied to the Emissions and Dispersion Modeling System (EDMS), an emission-estimating tool developed by the FAA for activities relative to airports. Typically, the EDMS input file quantifies aircraft activity relative to an aircraft's landing and takeoff (LTO) cycle. The cycle begins when the aircraft approaches the airport on its descent from cruising altitude, then lands and taxis to the gate, where it idles during passenger deplaning. The cycle continues as the aircraft idles during passenger boarding, taxis back out onto the runway, takes off, and ascends (climbout) to cruising altitude. Thus, the six specific operating modes in an LTO cycle are as follows:

- Approach;
- Taxi/idle-in;
- Taxi/idle-out;
- Idling;
- Takeoff; and
- Climbout.

The LTO cycle provides a basis for calculating aircraft emissions. During each mode of operation, an aircraft engine operates at a specific power setting and fuel consumption rate for a given aircraft make and model. Emissions for one complete cycle are calculated using emission factors for each operating mode for each specific aircraft engine combined with the typical period of time the aircraft is in the operating mode.

For this assessment, EPA ran the EDMS model using default time-in-mode values for each component of the LTO cycle. Next, the Agency adjusted the time-in-mode values in the model to account for additional time spent traveling to the deicing pad (15 minutes), engine idling while deicing (30 minutes), and taxing away from the deicing pad (15 minutes) and reran the model with these adjusted time-in-mode values. Then, EPA subtracted the baseline model run from the second model run to estimate the additional emissions associated with deicing.

EPA then adjusted these values to reflect the snow or freezing precipitation (SOFP) days for each airport by multiplying the annual values by the SOFP days divided by 365 days per year.

EPA also estimated total annual LTO aircraft emissions for the seven airports to compare aircraft emissions associated only with deicing. The calculations indicate that the proposed rule could increase carbon monoxide emissions from aircraft at the impacted airports by as much as 6.9 percent due to additional ground-time needed for pad deicing. Although the annual percentage increase in criteria pollutant emissions from the seven airports included in this analysis is a concern, the actual increase in emissions (*e.g.,* 903 tons per year of carbon monoxide) is insignificant when compared to total criteria pollutant emissions for the aircraft sector. For example, in 2002, EPA estimated total carbon monoxide emissions from the aircraft sector at approximately 260,000 tons. The increase in criteria pollutant emissions resulting from additional aircraft deicing time account amounts to less than a 0.3 percentage increase in the aircraft sector annual criteria pollutant emissions.

3. Emissions From AFB Treatment Systems

Anaerobic digestion of glycols found in ADF contaminated stormwater generates biogas containing approximately 60 percent methane and 40 percent carbon dioxide. Airports installing AFBs for treatment of ADF contaminated stormwater are expected to burn a portion of the gas in on-site boilers in order to maintain reactor temperature. The remainder of gas can be either combusted in a microturbine for electricity generation or flared. Regardless of the combustion technology, nearly all biogas generated by AFBs is converted to carbon dioxide, the primary greenhouse gas. EPA calculates 17,300 additional tons per

[1] This diesel fuel price was the average reported by the Energy Information Administration for the 2004–05 winter season, the same period that EPA is analyzing for airport deicing activity.

year for 60% ADF capture, which is very small relative to other sources. For example, in 2006, industrial facilities combusting fossil fuels emitted 948 million tons of CO_2 equivalents. An additional 17,300 tons per year of carbon dioxide from AFB treatment is less than 0.002 percent of the annual industrial carbon dioxide emissions nationwide.

C. Solid Waste Generation

AFB bioreactors will generate sludge that will require disposal, likely in an off-site landfill. To estimate annual sludge generation by the AFB bioreactors that may be installed at airports to treat ADF-contaminated stormwater, EPA first estimated the potential COD removal for the proposed collection and treatment scenarios and then applied published anaerobic biomass yield information to estimate total sludge generation on a national basis. The biomass yield calculation, which simply multiplies the COD removal by the yield, is a rough method of estimating sludge generation and does not account for other factors such as degradation or inorganic material (*e.g.,* AFB media) that may be entrained into the sludge. However, this method does provide an order of magnitude estimate of sludge generation that can be compared to other types of common biological treatment systems to determine if AFB sludge generation would be unusually high at airports treating ADF-contaminated stormwater.

To provide some perspective on the potential total amount of biomass produced annually by the AFB biological reactors treating ADF-contaminated stormwater, EPA compared the most conservative biomass generation estimate with its national biosolids estimates for all domestic wastewater treatment plants throughout the United States. Approximately 8.2 million dry tons of biosolids will be produced in 2010. EPA estimates that AFB bioreactors treating ADF-contaminated stormwater will increase biosolids generation in the United States by less than 0.01 percent.

XII. Regulatory Implementation

A. Relationship of ELGs to NPDES Permits

Effluent guidelines act as a primary mechanism to control the discharge of pollutants to waters of the U.S. Once finalized, the regulations would be applied to airports through incorporation in individual or general NPDES permits issued by EPA or authorized states or tribes under section 402 of the Act.

The Agency has developed the limitations for this proposed rule to cover the discharge of pollutants for this point source category. In specific cases, the NPDES permit authority may elect to establish technology-based permit limits for pollutants not covered by this regulation. In addition, if state water quality standards or other provisions of state or federal law require limits on pollutants not covered by this regulation (or require more stringent limits or standards on covered pollutants to achieve compliance), the permit authority must apply those effluent limitations or standards.

For individual permits, ELG provisions are typically incorporated when those permits are renewed, although permit authorities may require modification upon promulgation.

B. Best Management Practices

Sections 304(e), 308(a), 402(a), and 501(a) of the CWA authorize the Administrator to prescribe BMPs as part of effluent guidelines and standards or as part of a permit. EPA's BMP regulations are found at 40 CFR 122.44(k). Section 304(e) of the CWA authorizes EPA to include BMPs in effluent limitation guidelines for certain toxic or hazardous pollutants to control ''plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage.'' CWA section 402(a)(1) and NPDES regulations (40 CFR 122.44(k)) also provide for best management practices to control or abate the discharge of pollutants when numeric limitations and standards are infeasible. In addition, section 402(a)(2), read in concert with section 501(a), authorizes EPA to prescribe as wide a range of permit conditions as the Administrator deems appropriate in order to ensure compliance with applicable effluent limitations and standards and such other requirements as the Administrator deems appropriate.

Dikes, curbs, and other control measures are being used at some airport facilities to contain leaks and spills as part of good ''housekeeping'' practices. However, on a facility-by-facility basis a permit writer may choose to incorporate BMPs into the permit. *See* the TDD for this proposed rule for a detailed discussion of pollution prevention and best management practices used by airports.

C. Upset and Bypass Provisions

A ''bypass'' is an intentional diversion of the streams from any portion of a treatment facility. An ''upset'' is an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. EPA's regulations concerning bypasses and upsets for direct dischargers are set forth at 40 CFR 122.41(m) and (n) and for indirect dischargers at 40 CFR 403.16 and 403.17.

D. Variances and Modifications

The CWA requires application of effluent limitations established pursuant to section 301 or pretreatment standards of section 307 to all direct and indirect dischargers. However, the statute provides for the modification of these national requirements in a limited number of circumstances. Moreover, the Agency has established administrative mechanisms to provide an opportunity for relief from the application of the national effluent limitations guidelines and pretreatment standards for categories of existing sources for toxic, conventional, and nonconventional pollutants.

1. Fundamentally Different Factors Variance

EPA, with the concurrence of the State, may develop effluent limitations or standards different from the otherwise applicable requirements if an individual discharging facility is fundamentally different with respect to factors considered in establishing the limitation of standards applicable to the individual facility. Such a modification is known as a ''fundamentally different factors'' (FDF) variance. EPA, in its initial implementation of the effluent guidelines program, provided for the FDF modifications in regulations. These were variances from the BCT effluent limitations, BAT limitations for toxic and nonconventional pollutants and BPT limitations for conventional pollutants for direct dischargers. For indirect dischargers, EPA provided for FDF modifications from pretreatment standards. FDF variances for toxic pollutants were challenged judicially and ultimately sustained by the Supreme Court. (*Chemical Manufacturers Association* v. *Natural Resources Defense Council,* 479 U.S. 116 (1985)).

Subsequently, in the Water Quality Act of 1987, Congress added new sec. 301(n) of the Act. This provision explicitly authorizes modifications of the otherwise applicable BAT effluent limitations or categorical pretreatment standards for existing sources, if a facility is fundamentally different with respect to the factors specified in section 304 (other than costs) from those considered by EPA in establishing the effluent limitations or pretreatment standard. Section 301(n) also defined the conditions under which EPA may establish alternative requirements. Under section 301(n), an application for approval of a FDF variance must be based solely on (1) information submitted during rulemaking raising the factors that are fundamentally different or (2) information the applicant did not have an opportunity to submit. The alternate limitation or standard must be no less stringent than justified by the difference and must not result in markedly more adverse non-water quality environmental impacts than the national limitation or standard.

EPA regulations at 40 CFR Part 125, subpart D, authorizing the Regional Administrators to establish alternative limitations and standards, further detail the substantive criteria used to evaluate FDF variance requests for direct dischargers. Thus, 40 CFR 125.31(d) identifies six factors (*e.g.,* volume of process wastewater, age and size of a discharger's facility) that may be considered in determining if a facility is fundamentally different. The Agency must determine whether, based on one or more of these factors, the facility in question is fundamentally different from the facilities and factors considered by EPA in developing the nationally applicable effluent guidelines. The regulation also lists four other factors (*e.g.,* inability to install equipment within the time allowed or a discharger's ability to pay) that may not provide a basis for an FDF variance. In addition, under 40 CFR 125.31(b)(3), a request for limitations less stringent than the national limitation may be approved only if compliance with the national limitations would result in either (a) a removal cost wholly out of proportion to the removal cost considered during development of the national limitations, or (b) a non-water quality environmental impact (including energy requirements) fundamentally more adverse than the impact considered during development of the national limits. EPA regulations provide for an FDF variance for indirect dischargers at 40 CFR 403.13. The conditions for approval of a request to modify applicable pretreatment standards and factors considered are the same as those for direct dischargers. The legislative history of section 301(n) underscores the necessity for the FDF variance applicant to establish eligibility for the variance. EPA's regulations at 40 CFR 125.32(b)(1) are explicit in imposing this burden upon the applicant. The applicant must show that the factors relating to the discharge controlled by the applicant's permit which are claimed to be fundamentally different are, in fact, fundamentally different from those factors considered by EPA in establishing the applicable guidelines. The criteria for applying for and evaluating applications for variances from categorical pretreatment standards are included in the pretreatment regulations at 40 CFR 403.13(h)(9). In practice, very few FDF variances have been granted for past ELGs. An FDF variance is not available to a new source subject to NSPS or PSNS.

2. Economic Variances

Section 301(c) of the CWA authorizes a variance from the otherwise applicable BAT effluent guidelines for nonconventional pollutants due to economic factors. The request for a variance from effluent limitations developed from BAT guidelines must normally be filed by the discharger during the public notice period for the draft permit. Other filing periods may apply, as specified in 40 CFR 122.21(m)(2). Specific guidance for this type of variance is provided in ''Draft Guidance for Application and Review of Section 301(c) Variance Requests,'' August 21, 1984, available on EPA's Web site at *http://www.epa.gov/npdes/pubs/OWM0469.pdf.*

3. Water Quality Variances

Section 301(g) of the CWA authorizes a variance from BAT effluent guidelines for certain nonconventional pollutants due to localized environmental factors. These pollutants include ammonia, chlorine, color, iron, and total phenols.

XIII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a ''significant regulatory action.'' Accordingly, EPA submitted this action to the Office of Management and Budget (OMB) for review under EO 12866 and any changes made in response to OMB recommendations have been documented in the docket for this action.

B. Paperwork Reduction Act

The information collection requirements in today's proposed rule have been submitted for approval to OMB under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* An Information Collection Request (ICR) document has been prepared by EPA and has been assigned EPA ICR No. 2326.01. Proposed § 449.20 would require airports to collect ADF usage data and demonstrate compliance with requirements for ADF capture and urea-based pavement deicers.

EPA estimates it would take an annual average of 14,213 hours and $706,051 for airport respondents, and 11,440 hours and $377,420 for airline respondents to collect and report the information required by the proposed rule. This estimate is based on average labor rates from EPA's airport questionnaire for the airport personnel involved in collecting and reporting the information required. EPA estimates it would take an average of 218 hours and $7,195 for permit authorities to review the information submitted in response to requirements in the proposed rule as part of permit applications, renewals, and NOIs. EPA estimates that there would be no start-up or capital cost associated with the information described above. Burden is defined at 5 CFR 1320(b).

An Agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9.

To comment on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, EPA has established a public docket for this rule, which includes this ICR, under Docket ID number EPA–HQ–OW–2004–0038. Submit any comments related to the ICR to EPA and OMB. *See* **ADDRESSES** section at the beginning of this notice for where to submit comments to EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, *Attention:* Desk Officer for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after August 28, 2009, a comment to OMB is best assured of having its full effect if OMB receives it by September 28, 2009. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For the purposes of assessing the impacts of today's proposed rule on small entities, EPA determined that all airports expected to be within scope are owned by government entities. The RFA defines a small government entity as governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than 50,000 (5 U.S.C. 601(5)). After matching each airport-owning governmental entity with its population, EPA estimates that 34 (8 unweighted) of 218 (114 unweighted) airports in the scope of the proposed rule, or 16 percent, are owned by small government entities. EPA projected impacts on these small airports using the revenue test described in Section VIII.D.2. EPA found that 3 of the 34 small in-scope airports are expected to incur annualized compliance costs exceeding three percent of airport operating revenues. After considering the economic impact of today's proposed rule on small entities, including consideration of alternative regulatory approaches, I certify that this action will not have significant economic impact on a substantial number of small entities.

EPA undertook a number of steps to minimize the impact of this rule on small entities. According to the FAA National Plan of Integrated Airport Systems (2007–2011), there are approximately 2,800 public use general aviation and reliever airports in the U.S., some of which have substantial cargo service. Many, if not most, of these airports are likely to be owned by small government entities. Also likely to be owned by small governmental entities are approximately 135 non-primary commercial service airports. EPA has chosen not to regulate any general aviation, reliever, or non-primary commercial service airports under the proposed regulation. EPA also estimates that in addition to the 34 small government-owned primary commercial airports, another 42 primary commercial airports are owned by small government entities, but will be out-of-scope of the proposed regulation because little or no ADF is used at those airports.

D. Unfunded Mandates Reform Act

This proposed rule does not contain a Federal mandate that may result in expenditures of $100 million or more for State, local, and tribal governments, in the aggregate, or the private sector in any one year. As explained in Section VIII and the TDD, the annual cost of the proposal is $91.3 million. Thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

By statute, a small government jurisdiction is defined as a government with a population less than 50,000 (5 U.S.C. 601). Because all in-scope airports are owned by a government or governmental agency, the definition for a small airport is identical for the purposes of both UMRA and SBREFA. If the rule exceeds annual compliance costs of $100 million in aggregate all provisions of UMRA will need to be met. If the rule does not exceed $100 million in aggregate costs, but small airports are significantly or uniquely affected by the rule, EPA will be required to develop the small government agency plan required under sec. 203 because these airports are owned by small governments.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The scope of the proposed rule focuses on the airports that are the largest users of ADF. The proposed rule is not projected to exceed $100 million in aggregate annual compliance costs. Further, as discussed in Section XIII.C above, EPA has determined the rule will not have significant economic impact on a substantial number of small entities.

E. Executive Order 13132: Federalism

Executive Order 13132, entitled ''Federalism'' (64 FR 43255, August 10, 1999), requires EPA to develop an accountable process to ensure ''meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.'' ''Policies that have federalism implications'' is defined in the Executive Order to include regulations that have ''substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.''

This proposed rule does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. The proposed rule would not alter the basic state-federal scheme established in the Clean Water Act under which EPA authorizes states to carry out the NPDES permit program. EPA expects the proposed rule would have little effect on the relationship between, or the distribution of power and responsibilities among, the federal and state governments. Thus, Executive Order 13132 does not apply to this rule.

In the spirit of Executive Order 13132, and consistent with EPA policy to promote communications between EPA and State and local governments, EPA specifically solicits comment on this proposed rule from State and local officials.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This proposed rule does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 6, 2000). It will not have substantial direct effects on Tribal governments, on the relationship between the Federal government and Indian Tribes, or on the distribution of power and responsibilities between the Federal government and Indian tribes. Today's proposed rule contains no Federal mandates for Tribal governments and does not impose any enforceable duties on Tribal governments. Thus, Executive Order 13175 does not apply to this rule. In the spirit of Executive Order 13175, and consistent with EPA policy to promote communications between EPA and Tribal governments, EPA specifically solicits comment on this proposed rule from tribal officials.

G. Executive Order 13045: Protection of Children From Environmental Health and Safety Risks

EO 13045 (62 FR 19885, April 23, 1997) applies to rules that are economically significant according to EO 12866 and involve a health or safety risk that may disproportionately affect children. This action is not subject to EO 13045 because it does not satisfy either criterion.

H. Executive Order 13211: Energy Effects

This rule is not a ''significant energy action'' as defined in Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use'' (66 FR 28355, May 22, 2001) because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy, as described in Section XI of today's proposal. EPA determined that the additional fuel usage would be insignificant, relative to the total fuel consumption by airports and airlines, and the total annual U.S. fuel consumption.

I. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) of 1995, (Pub. L. 104–113, section 12(d); 15 U.S.C. 272 note) directs EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (*e.g.,* materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standard bodies. The NTTAA directs EPA to provide Congress, through OMB, explanations when the Agency decides not to use available and applicable voluntary consensus standards.

The Agency is not aware of any consensus-based technical standards for the types of controls contained in today's proposal. EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially applicable voluntary consensus standards and to explain why such standards should be used in this regulation.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629, Feb. 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

EPA has determined that this proposed rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations. The proposal would increase the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority or low-income population. The proposed rule will reduce the negative effects of discharges from airports to the nation's waters, to benefit all of society, including minority communities.

XIV. Solicitation of Data and Comments

A. General and Specific Comment Solicitation

EPA solicits comments on issues specifically identified in the preamble as well as any other issues that are not specifically addressed in today's notice. Comments are most helpful when accompanied by specific examples or supporting data. In addition, EPA solicits information and data on the following topics.

1. Airport-specific data on current ADF capture rates.
2. Technology-specific data on ADF capture rates.
3. Available ADF is defined at proposed 40 CFR 449.2 in terms of percentages. EPA solicits comments and data to support any alternative figures or flexibility for a permit writer to modify these percentages on a case-by-case basis. In addition, please provide comment on whether the permit writer should have the flexibility to modify the 80 percent default based on site-specific conditions and please suggest appropriate criteria on which to base the decision.
4. The identity and amount of the chemicals in formulations of ADF.
5. EPA invites comment on other possible minimum threshold criteria for the scope of the rule, such as the amount of ADF used, or number of deicing operational days. Please provide a rationale for any suggested alternate criteria.
6. Detailed information on additional best management practices that improve collection of ADF, and/or control and treatment of ADF discharges.
7. Information on start-up and O&M costs of pollution prevention technologies that improve collection of ADF or reduce use of ADF, such as infrared heating systems, and similar information about technologies that improve the cost-effectiveness of aircraft deicing and anti-icing practices.
8. Information about deicing practices at military facilities, including ADF usage, other operational characteristics and environmental impacts to help us decide whether to include them in the scope of this rule. If EPA decides to expand the scope, it may solicit additional public comment on the application of these requirements to military facilities.
9. Recommended operational practices for GRVs and deicing pads.
10. For the ADF collection requirement in proposed § 449.10, EPA may extend the usual 30-day compliance date to allow the additional time typically needed by publicly owned airport authorities to arrange financing for capital improvements. The extended compliance date could be as much as three years from date of promulgation. The Agency invites comment on the appropriate compliance period for this provision, and recommendations for interim measures.
11. Site-specific data and documentation on space limitations, available adjacent land and possible cost, along with recommendations for alternative ADF collection techniques, if deicing pads are not feasible.
12. Environmental impacts or safety issues associated with use of alternative pavement deicers instead of urea-based deicers.
13. To what extent, if any, do airports anticipate they will choose to monitor their discharges for ammonia rather than certify non-use of urea?
14. Deicing for safe taxiing. For airports choosing to comply with technology specifications as proposed in § 449.20(b)(1), the proposed rule would require all deicing activities to be conducted in locations were the ADF is actively collected, either by GRV or centralized pads, depending on the specific requirements. However, there may be situations where ice build-up prevents an aircraft from taxiing to the location where collection is conducted. For such situations, the proposed rule would allow up to 25 gallons of normalized ADF to be applied to allow for safe taxiing, without actively collecting the spent ADF. This volume is based on a current requirement at Denver International Airport. EPA requests comment on whether this is the appropriate ADF amount.
15. The alternative technology provisions in proposed § 449.20(b)(2) would require approval by the permit authority. EPA requests comment on whether any airports intend to use these provisions, and whether these provisions would be burdensome to permit authorities.
16. Criteria used to select data as the basis of the proposed effluent limitations for COD and the compliance alternative for ammonia. EPA also requests comment on whether data from start-up conditions should be included as a basis of the limitations.
17. Substitution of the weekly average effluent limitation for the monthly average effluent limitation for COD. EPA is proposing this substitution because of compliance monitoring concerns. EPA requests comments that identify other alternatives that may better address the issues with compliance monitoring, but still provide ongoing incentive for airports to target the system performance to the long-term average concentration of COD.

18. EPA requests comment on whether there are situations, such as extreme weather, in which operational or safety concerns would pose a challenge to the complete elimination of urea use for airfield pavement deicing. If so, please provide specific data or information documenting these concerns.

19. EPA requests comment on its proposal to treat new runway construction at existing airports as new sources. EPA specifically requests comment on its proposed determination that a new runway would be ''substantially independent of an existing source at the same site.'' EPA also requests any data relevant to the question of whether the proposed NSPS would pose a barrier to entry for new runway construction (*e.g.,* at smaller airports within the rule scope) or otherwise pose a barrier to entry for new sources.

20. EPA requests comment on whether there are situations where it may or may not be achievable for an airport with one or more deicing pads to use them for all commercial flights without exception. Should some provision be included in the rule to accommodate such situations? Commenters should give specific examples of such situations and explain clearly why it would not be feasible or economically achievable to use deicing pads for all commercial flights without exception.

21. EPA requests comment on whether there are airports in semi-warm climates for which de-icing is only required occasionally (at most several days per year), and whether it would be appropriate to make some provision for such airports, such as including a criterion related to ADF usage, number of de-icing days, or departures during certain seasons, in the scope criteria for the rule. In suggesting any such criteria, commenters should be mindful of implementation issues, such as availability and verification of appropriate data.

XV. Guidelines for Submission of Analytical Data

EPA requests that commenters on today's proposed rule submit analytical, flow, and aircraft departure data to supplement data collected by the Agency during the regulatory development process. To ensure that EPA may effectively evaluate these data, EPA suggests these guidelines for submission of data.

A. Types of Data Requested

EPA requests paired influent and effluent treatment data for each of the technologies identified in the technology options (*see* Section VII.B) as well as any additional technologies applicable to the treatment of deicing and anti-icing wastewater. EPA prefers paired influent and effluent treatment data, but solicits unpaired data as well. EPA will not evaluate data from systems treating only non-deicing wastewater (*e.g.,* sanitary wastewater).

For the systems treating deicing wastewater, EPA requests paired influent and effluent treatment data from samples of flowing wastewater streams. This includes end-of-pipe treatment technologies and in-process treatment, recycling, or water reuse. If commenters submit only effluent data, commenters should provide evidence that the influent is highly concentrated. EPA also prefers individual measurements, rather than averages, to better evaluate variability, but will consider averages if individual measurements are unavailable. EPA prefers that the measurements are for 24-hour composite samples, but also will consider data for grab samples.

EPA prefers that commenters submit data in an electronic format. In addition to providing the measurement of the pollutant in each sample, EPA requests that sites provide the detection limit (rather than specifying zero or ''ND'') if the pollutant is not detected in the wastestream. Identify each measurement with a sample collection date, the sampling point location, and the flow rate at that location. For each sample or pollutant, identify the analytical method used.

In support of the treatment data, commenters should submit the following items if they are available: A process diagram of the treatment system that includes the sampling point locations; treatment chemical addition rates; laboratory reports; influent and effluent flow rates for each treatment unit during the sampling period; sludge or waste oil generation rates; a brief discussion of the treatment technology sampled; and a list of deicing operations contributing to the sampled wastestream. If available, information and/or estimates of capital cost, annual (operation and maintenance) cost, and treatment capacity should be included for each treatment unit within the system. If specific flows or costs are not available but can reasonably be estimated, commenters should provide the assumptions used for the estimation procedure.

B. Analytes Requested

EPA considered metal, organic, conventional, and other nonconventional pollutant parameters for regulation. Based on analytical data collected, EPA initially identified 21 pollutants of concern for deicing operations (*see* Section VII.C and the TDD). The Agency requests analytical data for any of the pollutants of concern and for any other pollutant parameters that commenters believe are of concern. Of particular interest are COD, BOD_5, glycols, ammonia as nitrogen, and pH data. Commenters should submit data acquired with EPA or equivalent methods (generally, those approved at 40 CFR Part 136 for compliance monitoring), and should document the analytical method used for all data submissions.

C. Quality Assurance/Quality Control (QA/QC) Requirements

Although EPA requests and prefers that submissions of analytical data include any available documentation of QA/QC procedures, EPA will consider data submitted without detailed QA/QC information. If commenters sample wastewaters to respond to this proposal, EPA encourages them to provide detailed documentation of the QA/QC checks for each sample. EPA also requests that collection and analysis of ten percent field duplicate samples to assess sampling variability, and data for equipment blanks for volatile organic pollutants when automatic compositors are used to collect samples.

Appendix A: Abbreviations and Definitions Used in This Document

ADF—Aircraft deicing fluid (includes anti-icing fluid)
AFB—Anaerobic fluidized bed treatment technology
AIP—Airport Improvement Program
BAT—Best available technology economically achievable, as defined by sec. 301(b)(2)(A) and sec. 304(b)(2)(B) of the CWA
BOD_5—Biochemical oxygen demand
CAFR—Comprehensive annual financial reports
COD—Chemical oxygen demand
CPT—Cost pass-through
CWA—Clean Water Act
DSCR—Debt service coverage ratio
FAA—Federal Aviation Administration
FBO—Fixed base operator
GARB—General airport revenue bonds
LTO—Landing and takeoff cycle
Net income—Operating profit minus interest, taxes, depreciation, and non-operating profits and losses
NOI—Notice of Intent to discharge under a general permit (40 CFR 122.28(b)(2))
NSPS—New Source Performance Standards, as defined by sec. 306 of the CWA
O&M—Operations and maintenance
Operating profit—Revenues minus cost of providing those services
Outfall—The mouth of conduit drains and other conduits from which a facility effluent discharges into receiving waters

PFC—Passenger facility charges
Revenues—Money received for services rendered
RFA—Regulatory Flexibility Act
RPM—Revenue passenger miles
RTM—Revenue ton miles
SOFP—Snow or freezing precipitation

List of Subjects in 40 CFR Part 449

Environmental protection, Airport deicing, Airport, Airline, Waste treatment and disposal, Water pollution control.

Dated: August 17, 2009.

Lisa P. Jackon,

Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is proposed to be amended by adding part 449 to read as follows:

PART 449—AIRPORT DEICING POINT SOURCE CATEGORY

Subpart A—Airport Deicing Category

Subpart B—[Reserved]

Authority: 33 U.S.C. 1311, 1314, 1316, 1318, 1342, 1361 and 1370.

Subpart A—Airport Deicing Category

§ 449.1 Applicability.

This part applies to discharges of pollutants from deicing operations at Primary Airports with at least 1,000 annual scheduled commercial air carrier jet departures.

§ 449.2 General definitions.

The following definitions apply to this part:

Aircraft deicing fluid (ADF) means a fluid applied to aircraft to remove or prevent any accumulation of snow or ice on the aircraft. This includes deicing and anti-icing fluids.

Airfield pavement means all paved surfaces on the airside of an airport.

Airside means the part of an airport directly involved in the arrival and departure of aircraft, including runways, taxiways, aprons and ramps.

Annual jet departures means the average number of commercial jet aircraft that take off from an airport on an annual basis, as tabulated by the Federal Aviation Administration, calculated over the five-year period prior to submittal of a permit application or NOI.

Annual normalized ADF usage means the average amount of normalized aircraft deicing fluid used annually, calculated over the five year period prior to submittal of a permit application or Notice of Intent.

Available ADF means 80 percent of the sprayed deicing fluid and 10 percent of the sprayed anti-icing fluid.

Certification statement means a written submission to the Director stating that the discharger does not use airfield deicing products that contain urea.

COD means Chemical Oxygen Demand.

Deicing for safe taxiing means the minimal extent of deicing activity that would remove snow or ice to the level needed to prevent damage to a taxiing aircraft, and that is performed at a location not having ADF collection equipment.

Deicing operations mean procedures and practices to remove or prevent any accumulation of snow or ice on:

(1) An aircraft; or

(2) Paved surfaces within an airport's aircraft movement area (runway, taxiway, apron, or ramp).

New source. For the purpose of the definitions at 40 CFR 122.2 and 40 CFR 122.29(b)(1), a new source includes:

(1) Any new Primary Airport constructed after [date of promulgation]; and

(2) Any new runway constructed at a Primary Airport, the deicing operations associated with the departures on the new runway and the deicing of paved surfaces associated with the new runway.

Normalized aircraft deicing fluid means ADF less any water added by the manufacturer or customer before ADF application.

Notice of Intent (NOI) means a Notice of Intent to discharge under a general permit, as described at 40 CFR 122.28(b)(2).

Percent capture requirement means the requirement in §§ 449.10 and 449.11 for the permittee to collect at least 60 percent or 20 percent (as applicable) of the available ADF.

Primary Airport means an airport defined at 49 U.S.C. 47102 (15).

§ 449.10 Effluent limitations representing the best available technology economically achievable (BAT).

Except as provided in 40 CFR 125.30 through 125.32, any existing point source subject to this part must comply with the following requirements representing the degree of effluent reduction attainable by the application of the best available technology economically achievable (BAT).

(a) *Collection of runoff from aircraft deicing.* (1) All dischargers subject to this Part, with 10,000 or greater annual departures and annual normalized ADF usage of 460,000 gallons or greater, must collect at least 60 percent of available ADF and comply with applicable discharge standards in paragraph (b) of this section.

(2) All dischargers subject to this part, with annual departures of 10,000 or greater, and annual normalized ADF usage less than 460,000 gallons, must collect at least 20 percent of the available ADF and comply with applicable discharge standards in paragraph (b) of this section for all the collected ADF.

(b) *Treatment of collected runoff from aircraft deicing.* Except for ADF collected and transported to off-site treatment facilities, any existing point source subject to this Part must achieve the numeric effluent limitations in Table I. These limitations must be met for all ADF collected pursuant to paragraphs (a) and (b) of this section. Compliance must be measured at the outfall of the on-site treatment system utilized for meeting these limitations:

TABLE I—BAT LIMITATIONS

Wastestream	Pollutant or pollutant property	Daily maximum mg/L	Weekly average mg/L
Aircraft Deicing	COD	271	154

(c) *Airfield pavement discharges.* Except as provided in § 449.10(d), any discharger subject to this Part must certify that it does not use airfield deicing products that contain urea. The responsible officer as defined in 40 CFR

122.22 must sign this certification statement.

(d) *Compliance alternative for airfield BAT requirements.* A discharger may select and implement the following compliance alternative, which is deemed to meet the relevant BAT requirement specified in paragraph (c) of this section:

(1) Airfield pavement discharges must achieve the numeric limitations for ammonia in Table II.

TABLE II—BAT LIMITATIONS

Wastestream	Pollutant or pollutant property	Daily maximum mg/L
Airfield Pavement Deicing	Ammonia as Nitrogen	14.7

§ 449.11 New source performance standards (NSPS).

New sources subject to this Part must achieve the following new source performance standards:

(a) *Collection of runoff from aircraft deicing.* All new sources subject to this Part, with annual departures of 10,000 or greater, shall collect at least 60 percent of available ADF and comply with applicable discharge standards in paragraph (b) of this section for all collected ADF.

(b) *Treatment of collected runoff from aircraft deicing.* Except for ADF collected and transported to off-site treatment facilities, any new source subject to this Part must achieve the new source performance standards in Table III. These standards must be met for all ADF collected pursuant to paragraph (a) of this section. Compliance must be measured at the outfall of the on-site treatment system utilized for meeting these standards:

TABLE III—NSPS

Wastestream	Pollutant or pollutant property	Daily maximum mg/L	Weekly average mg/L
Aircraft Deicing	COD	271	154

(c) *Airfield pavement discharges.* Except as provided in § 449.11(d), any new source subject to this Part must certify that it does not use airfield deicing products that contain urea. The responsible officer as defined in 40 CFR 122.22 must sign this certification statement.

(d) *Compliance alternative for airfield NSPS requirement.* A discharger may select and implement the following compliance alternative, which is deemed to meet the relevant NSPS requirement specified in paragraph (c) of this section:

(1) Airfield pavement discharges must achieve the numeric limitations for ammonia in Table IV.

TABLE IV—NSPS

Wastestream	Pollutant or pollutant property mg/L	Daily maximum mg/L
Airfield Pavement Deicing	Ammonia as Nitrogen	14.7

(2) [Reserved]

§ 449.20 Monitoring, reporting and recordkeeping requirements.

(a) *Reporting ADF use.* Dischargers subject to § 449.10 or § 449.11 must report the annual normalized ADF usage when submitting a permit renewal application.

(b) *Demonstrating the percent of ADF collected.* Except as provided in 40 CFR 125.30 through 125.32, the Director shall select one of the following three methods and specify it in the permit as the required method for the permittee to demonstrate compliance with the percent capture requirement in § 449.10 or § 449.11 as applicable.

(1) The permittee shall demonstrate that it is operating and maintaining one of the following ADF collection technologies according to the technical specifications set forth in paragraphs (b)(1)(i) and (ii) of this section. These technical specifications shall be expressly set forth as requirements in the permit. This demonstration constitutes compliance by the permittee with the applicable percent capture requirement without the permittee having to determine the numeric percentage of ADF that it has collected.

(i) *Glycol Recovery Vehicle (GRV).* Operation of a GRV in accordance with these technical specifications is sufficient to demonstrate compliance with a requirement to collect at least 20 percent of the available ADF:

(A) All deicing activities shall take place in an area where available ADF is actively collected by GRVs, unless deicing for safe taxiing is also required. When deicing for safe taxiing is required, the volume of ADF used must not exceed 25 gallons of normalized ADF per aircraft.

(B) An emulsifier must be used to aid in ADF recovery, in accordance with manufacturer requirements.

(C) ADF collection by GRV shall commence as soon after deicing activities begin, and as is practicable and safe.

(D) The permittee shall ensure that GRVs are maintained in accordance with the manufacturer's specifications and shall inspect them at the beginning and end of each deicing season to verify that proper maintenance is taking place.

(ii) *Centralized Deicing Pad.* Operation of a centralized deicing pad collection system in accordance with these technical specifications is sufficient to demonstrate compliance with a requirement to collect at least 60 percent of the available ADF.

(A) All aircraft deicing shall take place on a centralized deicing pad, with the exception of deicing for safe taxiing.

(B) The volume of ADF used while deicing for safe taxiing shall not exceed 25 gallons of normalized ADF per aircraft.

(C) Drainage valves associated with the centralized deicing pad shall be activated to collect spent ADF before deicing activities commence.

(D) Deicing facilities shall be sized to accommodate the airport's peak hourly departure rate.

(E) The minimum width of the centralized deicing pad shall equal the upper wingspan of the most demanding airplane design group using the deicing pad.

(F) The minimum length of the centralized deicing pad shall equal the fuselage length of the most demanding aircraft using the pad.

(G) Each centralized deicing pad must be equipped with a fluid collection system, such as a perimeter trench and diversion valve, to capture spent ADF and ADF-contaminated water.

(2) *Alternate technology or specifications.* (i) The Director, on a case-by-case basis, may require:

(A) The use of a different ADF collection technology from the technologies specified in paragraph (b)(1) of this section; or

(B) The use of the same technology, but with different specifications for operation and maintenance; or

(C) The use of an alternative pollution prevention technology that may result in a reduction of applied ADF relative to current practices at the facility. At the Director's discretion, this reduction may be applied towards the collection requirement.

(ii) The Director shall set forth technical specifications for proper operation and maintenance of the chosen collection technology and these technical specifications must be expressly included as requirements in the permit. The permittee must demonstrate compliance with these requirements. This demonstration constitutes compliance by the permittee with the percent capture requirement without the permittee having to determine the numeric percentage of ADF that it has collected. Before the Director may specify an alternate technology under this subsection, the permittee must demonstrate to the Director's satisfaction that the alternate technology will achieve the percent capture requirement applicable under the permit.

(3) The permittee shall be required to monitor periodically, by means deemed acceptable by the Director, and at a frequency determined by the Director, the amount of ADF sprayed and the amount of available ADF collected in order to determine the compliance with the percent capture requirement.

(c) Airfield pavement discharge certification. Except as provided in §§ 449.10(d) and 449.11(d), dischargers subject to § 449.10 or § 449.11 must submit a certification statement that they do not use airfield deicing products that contain urea. The discharger must provide the certification statement to the Director when submitting a permit renewal application and on an annual basis.

(d) *Monitoring requirements.* Dischargers subject to § 449.10 or § 449.11 must conduct compliance monitoring to demonstrate compliance with the COD limitation.

(1) If a discharger chooses to comply with the compliance alternative specified in §§ 449.10(d) or 449.11(d), the discharger must conduct compliance monitoring to demonstrate compliance with the alternative ammonia limitations.

(e) *Recordkeeping.* The permittee must maintain on-site, for a period of five years from the date they are created, records documenting compliance with paragraphs (b) through (d) of this section.

Subpart B—[Reserved]

[FR Doc. E9–20291 Filed 8–27–09; 8:45 am]

BILLING CODE 6560–50–P