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FAA Storm Water Program

Dr. W.H. Espey, Jr., Member[1]
Dr. Raymond Rose[2]
George I. Legarreta[3]

Abstract

United States Environmental Protection Agency (EPA) promulgated regulations in November 16, 1991 pursuant to the Clean Water Act in the issuance of National Pollution Discharge Elimination System (NPDES) permit application regulations for storm water discharge. These regulations concern certain municipal and industrial activities. Air transportation facilities are included in the industrial activity category. The EPA storm water regulations specifically target airport deicing operations as an industrial activity. These regulations may increase Airport Improvement Program (AIP) trust fund expenditures for storm water control improvements. The Federal Aviation Administration (FAA), therefore, initiated a storm water program to assist airport operators in complying and meeting the new EPA storm water regulations.

1.0 Introduction

On November 16, 1990, the EPA issued its final rules regarding NPDES permits (40 CFR, Section 402) for storm

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[1]Chairman of the Board, Espey, Huston & Associates, Inc., P.O. Box 519, Austin, Texas 78767

[2]Manager, Environmental Engineering, Williamsburg Office, Espey, Huston & Associates, Inc., 460 McLaws Circle, Suite 150, Williamsburg, Virginia

[3]Civil Engineer, Office of Airport Safety and Standards, Federal Aviation Administration, U.S. Department of Transportation, 800 Independence Avenue, S.W., Washington, D.C. 20591

water discharges from municipal and certain industrial activities. Air transport facilities are included in these industrial activities. Specifically defined within EPA regulations the "Transportation facilities classified as Standard Industrial Classifications...45...which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations....are associated with industrial activity." Many airports are engaged in light- and heavy-duty aircraft maintenance activities. Aircraft cleaning, lubricating, painting, refueling, and other maintenance and repair activities involve an array of chemicals, that if not properly controlled, can degrade water quality. Airports are often sites of outdoor storage where material and equipment are exposed to precipitation. There are also areas of significant exhaust emissions. This potential increase in pollutant loading can significantly degrade water quality in the receiving waters. EPA Storm Water Regulations specifically target airport deicing operations which, if restricted, may cause a negative effect on an airport's capacity.

FAA has initiated a storm water program to assist airport operators in complying with the EPA Storm Water NPDES Regulations. The first project, a survey, addresses present operational practices, operation equipment, deicing agents, chemical and hazardous wastes at existing airport facilities. The results of this first FAA project will provide a data base to develop future technical and management procedures to assist airports in complying with the new EPA NPDES Storm Water Regulations. A central focus of the EPA Storm Water Program is managing and controlling the deicing and anti-icing chemicals that are used in airport operations. The ultimate goal of the FAA is to develop guidelines and procedures for "Best Management Practices" (BMP), including physical alternatives, to mitigate the impact of chemical concentrates resulting in compliance with the NPDES Storm Water Program while continuing to meet current design standards. The Aircraft Deicing and Anti-Icing Conference in Denver, Colorado (September 20-22, 1988), between the FAA and the aviation industry agree that airports and industry standards are necessary to properly address the environmental issues.

2.0 Airport Storm Water Questionnaire

An Airport Storm Water Questionnaire was developed to obtain information on practices and potential pollutants for airport activities affected under the new EPA Storm Water Regulations. The Questionnaire was mailed on

September 23-24, 1991 to 131 airports by the FAA in cooperation with the American Association of Airport Executives (AAAE). Ninety-six airports responded to the Questionnaire. In general, responses to the Questionnaire were spotty and for some questions limited in the amount of information submitted. As originally requested in the Questionnaire, the airport was asked to collect the information from the air carriers with regards to deicing operations. However, some airports did not submit information regarding deicing operations from the air carriers. The data from the Questionnaire was compiled in the "Paradox" software package for data processing and analysis.

3.0 Summary

In general, ethylene glycol was the predominant aircraft deicing agent that was reported in the Questionnaire. Only six airports reported underground storage of ethylene glycol. Maximum capacities ranged from 125,000-140,000 gallons. Twenty-five airports indicated the storage of ethylene glycol in above-ground tanks. Maximum tank capacity ranged from a few hundred gallons to a maximum of 30,000-50,000 gallons of ethylene glycol. Table 1 is a summary of ethylene glycol usage in terms of annual and maximum monthly volumes for the winters of 89-90 and 90-91. Figures 1 and 2 are graphical presentations of the annual glycol usage for the winter of 89-90 expressed in terms of FAA regional boundaries and FAA size classification for airports (large and medium hubs). Figure 1 represents the glycol usage for large hubs. The Eastern Region (AEA - New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia and West Virginia) indicated a glycol usage for the winter of 89-90 of approximately 450,000 gallons. This contrasts with the FAA Great Lakes Region (AGL - Ohio, Indiana, Illinois, Wisconsin, Minnesota, North and South Dakota, and Michigan) which indicated a glycol usage for the same winter period (89-90) of approximately 520,000 gallons. Figure 2 presents glycol usages for medium hub airports for the same FAA regions and winter period (89-90). Figure 2 indicates glycol usage of 210,000 gallons for FAA Region AEA and 66,300 gallons for FAA Region AGL. Seventy-one airports responded to the question concerning the collection and treatment of spent deicer/anti-icer fluids. Five airports indicated some percentage of treatment. Of those airports reporting some percentage of treatment, two indicated 100%; one, 80%; one, 97%; and one did not report. Of the 73 airports responding to the question concerning collection and recycling/reuse of spent aircraft deicer/anti-icers, only 1 airport in Florida indicated they were recycling and reusing 99% of the spent deicer/anti-icer fluids.

TABLE 1
TOTAL VOLUME OF ETHYLENE GLYCOL APPLIED TO AIRCRAFT
DURING PAST TWO WINTER SEASONS [II.B.3.a-b/e-f]

No.	FAA Region	FAA Classification	Total Annual Volume 89-90	Total Annual Volume 90-91	Max Month Volume 89-90	Max Month Volume 90-91
4	ASW	SH	16000	15900	12000.	11000
5	AWP	LH	150	150	150	150
6	AWP	MH	1485	1265	1000	685
7	AWP	MH	0	0	0	0
12	AWP	MH	0	0	UNK	UNK
15	ANM	SH	20000	35000	10000	15000
16	AEA	MH	210000	155000	67200	51000
17	AEA	LH	114600	62000	69000	35000
19	ASO	MH	10	40	5 gal	25 gal
27	ASO	SH	1200	1000	700	600
28	ACE	SH	20000	19210	15000	14500
29	AGL	SH	10000	10000	4000	4000
34	AGL	N-H	450	450	200	200
35	AGL	N-H	4000	4000	1000	1000
36	ACE	SH	22454	20922	10000	9000
38	ASW	SH	400	38%	400	38%
39	ASW	MH	900	100	900	100
42	ASW	SH	250	275	275	275
43	AEA	LH	UNK	188400	UNK	131928
44	AGL	LH	520000	329000	195000	110000
47	ACE	LH	147000	160000	45000	95000
48	ANM	SH	N/A	7500	N/A	2200
49	ASO	LH	24000	13500	10000	12000
51	ACE	SH	3600	39500	11000	15100
52	ACE	N-H	3000	2500	Unk	Unk
54	AWP	MH	70000	66000	25000	20000
59	AGL	SH	12400	5000	4500	3500
61	AGL	MH	66300	92000	20000	22000
63	ANM	MH	47000	52000	29000	31000
64	AEA	SH	17000	20000	N/A	N/A
65	AEA	LH	456291	414810	150576	136887
66	ASO	SH	3000	1000	DEC	JAN
68	ASO	SH	40	20	40	20
69	ASO	SH	6169	2923	3723	1049
70	ASO	SH	600	100	600	100
71	ASO	SH	-	-	-	-
72	ASO	SH	3200	2400	1600	1200
74	ASO	SH	9500	9500	9250	4200
75	ASW	SH	20000	18600	9000	8400
78	ASW	MH	4950	1750	4950	1750
79	ASW	MH	1240	1000	800	750
80	ASW	SH	220	300	220	300
81	ASW	MH	7140	2030	6140	1880
82	ANM	LH	37765	85579	11244	39698
83	AEA	MH	N/A	1500	N/A	800
84	AEA	MH	3425	550	1390	550
87	AEA	MH	300	125	•	•
90	AEA	MH	0	55 gal	–	55 gal
92	AEA	SH	4830 g	3880 g	1825 g	1490 g
95	AGL	SH	21748	26229	5815	7157.5
96	AEA	N-H	17500	12500	10000	10000

Figure 1

Annual Ethylene Glycol Usage, Winter 1989-90, Large Hubs

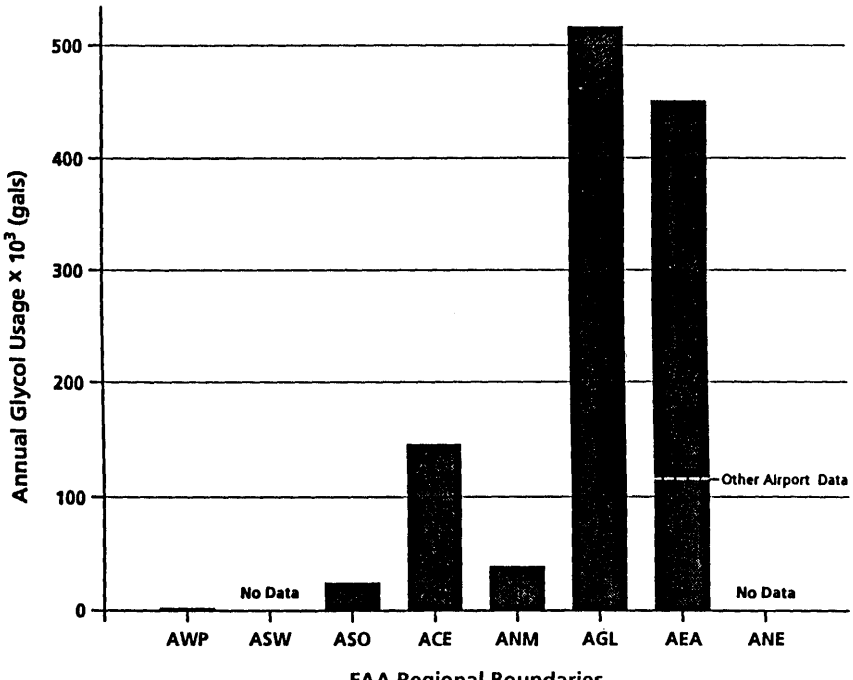
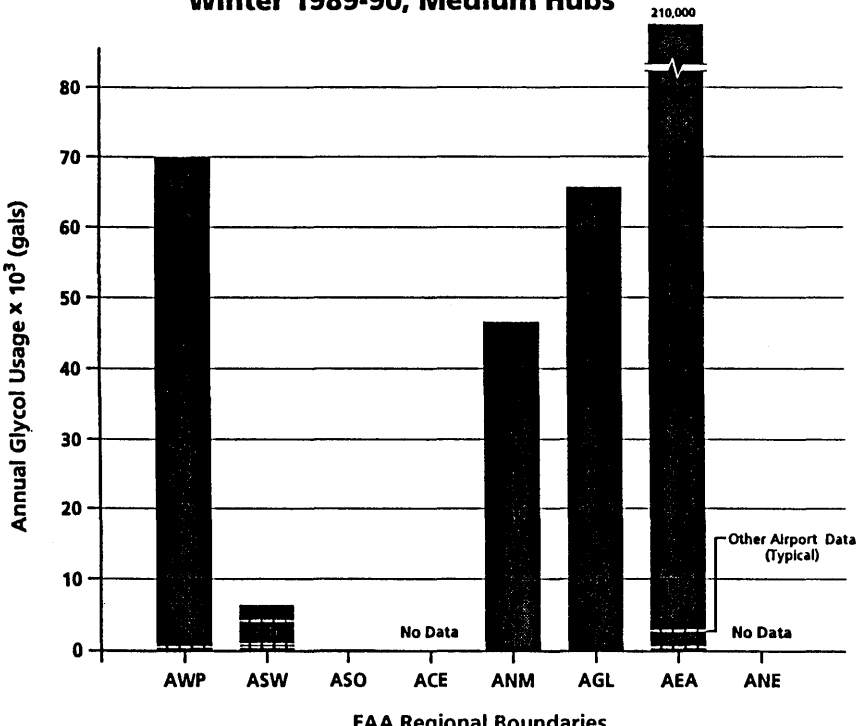


Figure 2

Annual Ethylene Glycol Usage, Winter 1989-90, Medium Hubs