

**SAWMILL CREEK - WATERSHED "RESTORATION"
PROJECT**

**EVALUATION BY ALLWOOD COMMUNITY
ASSOCIATION**

BY A. SCOTT MCDOWELL

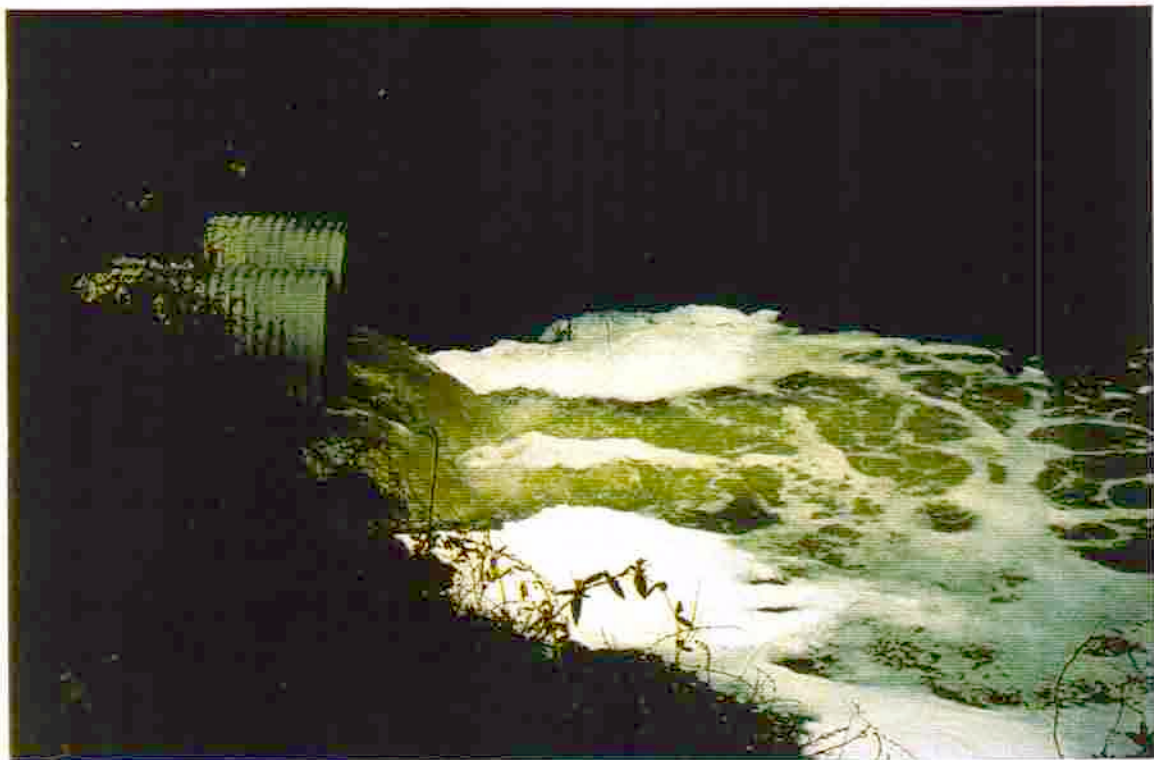


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MARCH 1997

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Sawmill Creek "Restoration" Project

I. BACKGROUND

The headwaters of Sawmill Creek emanate from the topographic high point located in the immediate area of Baltimore Washington International (BWI) airport near Linthicum, Maryland (Figure 1). Sawmill Creek is the subject of a "Multi-disciplinary Watershed Restoration" project through the Maryland Department of Natural Resources (MDNR) directed by Mr. Larry Lubbers. The attached summary of the project was downloaded from the EPA website under the search terms "airport" and "glycol" (Attachment 1). The restoration project is a part of the governor of Maryland's (Paris Glendening) Bay Work Group which is in turn part of the multi-state Chesapeake Bay Restoration Program. The map of the "restoration" area shown in the summary, shows that the "restoration" area is located between Aviation Boulevard and Hollins Ferry Road.

The "restoration" project was apparently initiated in response to a combination of erosion, sedimentation, and contamination from stormwater runoff from BWI airport. The contamination stems mainly from runoff of deicing fluids from deicing of aircraft during winter storm events. BWI is reportedly equipped with a deicing fluid containment system, storage tanks, and squeegee truck that helps to vacuum up deicing fluid.

Deicing fluid mainly consists of glycols (propylene glycol, ethylene glycol, and diethylene glycol). Ethylene glycol is the essential ingredient in standard car anti-freeze. Attachment 2 shows health and safety data for ethylene glycol. It is well known that anti-freeze is toxic to mammals if ingested in liquid form. Many pets have been killed by drinking "sweet" organic fluid. Ethylene glycol causes Central Nervous System (CNS) stimulation followed by depression. Kidney damage can be fatal with a dosage as small as 100 milliliters of pure ethylene glycol. The Threshold Limit Value (TLV) for ethylene glycol in air is 100 parts per million (ppm)⁽¹⁾. The information on the label for standard car antifreeze (Attachment 2) warns that inhalation of "mist or hot vapors" should be avoided. According to extensive study of biological toxicity study of deicing fluids and Sawmill Creek⁽²⁾, the deicing fluids contain additives such as dioxane, polymers, corrosion inhibitors, diethylene glycol, ethylene oxide, urea, and acetaldehyde. These additives result in a higher toxicity for the deicing fluids than pure ethylene or propylene glycols. It is clear that the deicing fluids present a health threat to humans and can severely damage aquatic life.

The "restoration" area is located directly behind the community of Allwood, Maryland. Residents of Allwood have formed the Allwood Community Association (ACA) in response to concerns generated from rapid growth of BWI airport. The ACA is particularly concerned that glycol contamination in Sawmill Creek is a serious health concern. In addition, noise from the airport, air pollution, and surface water contamination has lowered property values. In response to these concerns, the ACA sampled surface water in Muddy Bridge Branch of Sawmill Creek on 8 February 1997 during a winter storm event. U.S. Air aircraft were observed to be deicing planes near the upper portion of Sawmill Creek. When the deicing technicians noticed that they were being observed, they apparently ceased deicing temporarily. According to BWI officials, deicing is not supposed to occur in this area. The results of surface water sampling at Muddy Bridge Branch of Sawmill Creek at Aviation Boulevard collected on 8 February 1997 (Attachment 3) show total levels of glycols of approximately 3,000 ppm. According to the Maryland Department of Natural Resources, levels of ethylene glycol as high as 4,800 mg/L have been detected in Muddy Bridge Branch of Sawmill Creek. These levels are extremely high and present a serious health threat.



Figure 1

**Site Location - Sawmill Creek Watershed
"Restoration" Area**

(Source: USGS Relay, Maryland Topographic Quadrangle)

March 1997

Allwood Community Association
(ACA)

II. INSPECTION OF THE SAWMILL CREEK "RESTORATION" AREA

On 24 February 1997, one sample (ACA-3) was collected by the ACA at Aviation Boulevard from Muddy Bridge Branch of Sawmill Creek. On Saturday, 2 March 1997, members of the ACA inspected the "restoration" area and collected additional samples from two points (ACA-4 and ACA-5) along Muddy Bridge Branch of Sawmill Creek. Sample ACA-4 was collected just downstream of Hollins Ferry Road and Sample ACA-5 was collected just downstream of Aviation Boulevard. The results are shown in Attachment 3. The results from 24 February 1997 (ACA-3) showed no glycols detected. The results from 1 March 1997 showed levels of propylene glycol of 120 mg/L for both samples (ACA-4 and ACA-5) and no other glycols were detected. A storm event occurred the morning of 2 March 1997 where approximately 0.5 to 1.0-inch of rain fell.

Inspection of the "restoration" area revealed the following facts:

- (1) Sawmill Creek had a very noticeable white foam on it. This white foam is known to be associated with glycol contamination.
- (2) Sawmill Creek had a very strong odor, especially in locations where water was aerating due to a drop in elevation (small waterfall). Several of the members of the ACA reported being moderately ill from inhaling the vapors.
- (3) The "restoration" area was littered with 55-gallon drums, tires, and miscellaneous debris including a discarded water heater.
- (4) The "restoration" area was posted with a public notice that stated that the area had been requested to be rezoned from residential to industrial. Later the ACA found out that Maryland Industrial Enterprises (MIE) has requested the rezoning for a 60,000 ft² warehouse and access road.
- (5) Various survey markers and painted trees indicated that a wetlands delineation had been conducted on the site. Evidently, MIE intends to reroute and/or channelize the stream into a stormwater pipe.
- (6) Brush had already been removed from the under story of the site and several trees had been felled.

Attachment 4 shows photographs taken from the "restoration area" showing the foaming water, various debris, public notice, and the area in general. No signs of life were observed and it appears that the stream is essentially dead. However, a scientific Species Diversity Index (SDI) was not performed and the time of inspection was during late winter. It is doubtful if aquatic life could be sustained by the contaminated Sawmill Creek.

A audio tape and video tape were made of the site inspection and can be obtained from the ACA.

The ACA also noticed that a wetlands exists upstream of Aviation Boulevard. Mallard ducks were observed to be using the wetlands area. The ACA is not sure why these waterfowl were not visibly affected by the glycol contamination. The ACA also observed the headwaters of Sawmill Creek (several branches emanate from the airport property) just south and east of the "restoration" area (Figure 1). Spring peepers were heard in this drainage where none had been heard in the "restoration" area.

III. RESULTS OF INSPECTION OF SAWMILL CREEK "RESTORATION" AREA

It is clear from the inspection and analytical results of surface water from sawmill creek that:

- (1) The Muddy Bridge Branch of Sawmill Creek between Aviation Boulevard and Hollins Ferry Road is highly polluted with glycols from deicing fluid runoff from BWI airport. It is possible that additional pollutants (such as residual fuels, Volatile Organic Compounds, metals, lubricating oils, and deicing fluid additives such as dioxane, acetaldehyde, polymers, urea, and corrosion inhibitors) are also contained in the stormwater runoff.
- (2) The request from Maryland Industrial Enterprises (MIE) to rezone the residential and wetlands area to industrial and reroute the stream is directly conflicting with the local, state, and federal effort to restore not only Sawmill Creek watershed but the State of Maryland's Governor's Bay Work Group and entire multi-state Chesapeake Bay restoration project.
- (3) The Sawmill Creek "restoration" project area is littered with debris that should be removed.
- (4) Someone, apparently MIE, has already begun clearing trees and brush from the wetlands and restoration area. This is illegal because the request for a variance and mitigation of the wetlands has not yet been approved.
- (5) It appears that the water is still highly contaminated (based on the foaming of the water and the very strong odors), more than three weeks after a storm event. The results of sampling on 24 February 1997 (ACA-3) indicated no glycols detected. The results of sampling on 1 March 1997 (ACA-4 and ACA-5) showed 120 mg/L of propylene glycol. The 1 March 1997 samples were collected during a stormwater event. Therefore, it appears that the runoff event flushed out residual deicing fluids remaining from the deicing and storm event of 8 February 1997, three weeks later. The apparent pollution based on foaming of the water and noxious odors may in part be attributable to the deicing fluid additives, which degrade more slowly than the glycols.
- (6) The glycol and deicing additives contamination and runoff from BWI airport is located directly over an important drinking water aquifer for the area. The deicing additives include two known carcinogens, dioxane and acetaldehyde.

IV. NOTES FROM CONVERSATIONS WITH REGULATORY AGENCIES

IV.A. United States Geological Survey (USGS) - Michael Schmidt - (410) 512-4848

A formal complaint has been filed with the Maryland Department of the Environment (MDE) office in Prince Frederick, Maryland and U.S. Environmental Protection Agency (EPA). Water quality analyses from monitoring wells in the drinking water aquifer area are collected by the health department or the USGS. This data can not be retrieved until the USGS office is moved (1-2 weeks) and the computers are up again. We are not sure if the wells have been sampled for glycols. If they have not been in the past, the health department is aware of the situation and will sample for glycols in the future.

There are three (3) distinct aquifers: shallow, medium, and deep. The shallow aquifer is termed the Patapsco Aquifer and the deeper aquifer is termed the Patuxent Aquifer. The shallow aquifer is no longer being pumped and consequently the shallow aquifer has recovered. Mr. Schmidt told me that some observation wells were actually flowing (artesian conditions). This should help the base flow of Sawmill Creek that had been reduced from 6 cubic feet per second (cfs) to 1 cfs. The deeper aquifer is now being used for drinking water. Apparently, the groundwater is mixed with surface water at the treatment plant, however, we could not confirm this. There are two aquifer pumping wells, one near Dorsey Road and one just south of I-97.

Mr. Schmidt was not aware that the "restoration" area was under request to rezone industrial and construct a warehouse, access road, and reroute the stream. This is clearly antithetical to the restoration of the watershed.

Mr. Schmidt mentioned that an epidemiological study had concluded that Anne Arundel county had the highest rate of cancer in the state of Maryland and they were attempting to find out why.

According to Mr. Schmidt, the airport has a containment system which contains some of the deicing fluid into a storage tank which is then discharged to the wastewater treatment plant (need to find out where the treatment plant is - Stony Run?). Mr. Schmidt was aware that the airport has a squeegee truck that considers 50 % collection of deicing fluid to be "good".

BWI airport has their own consultant, Maryland Environmental Services (MES), that conducts work for the airport, including testing of stormwater discharges. According to what I was told from CIE laboratories, they have never seen levels of glycol near the 3,000 ppm that was detected on 8 February 1997. We are not sure whether the airport/MES is sampling in the wrong location, at the incorrect times of the year, or whether they have deliberately falsified the samples. It is clear from the high levels of glycols detected by the ACA and the MDNR that Muddy Bridge Branch and Sawmill Creek are being adversely affected by runoff of deicing fluids.

The USGS office is located in Towson, Maryland.

IV.B. U.S. EPA - Ms. Helen Draego - (215) 566-5796

The ACA has contacted the EPA Region III office in Philadelphia, Pennsylvania. Ms. Draego pointed out the Maryland Department of the Environment (MDE) is responsible for enforcing water quality laws under the Clean Water Act (CWA). (Note that the CWA act covers wastewater discharges to waters of the U.S. from point sources and stormwater discharges from non-point

sources. The airport runoff is covered as a non-point source.) My conversation with Ms. Draego was not too long, but she did say that they were aware of the situation and were working on it. She was not aware that the "restoration" area was being planned for industrial development and a parking lot.

IV.C. Maryland Department of Natural Resources - Mr. Larry Lubbers - (410) 974-3016

Mr. Lubbers is the author of the Sawmill Creek Restoration Project paper that we pulled off the Internet. Mr. Lubbers was not in but I did speak with a Mr. Paul Sturm who was familiar with the project. Again, Mr. Sturm was not aware that the area was planned for industrial development. He said that he would discuss it with Mr. Lubbers. Mr. Sturm agreed that this was not beneficial for the watershed. He said that Maryland Environmental Services (MES) had conducted some toxicological testing on the stormwater runoff but was not sure of the details. If MES is the same consultant that is working for BWI, I would be skeptical of their results in any case.

IV.D. Governor's Office in Annapolis - Ms. Evelina Erickson - (410) 767-4800

I spoke with Ms. Evelina Erickson of the Governor of Maryland's office in Annapolis, Maryland. She took my complaint concerning the rezoning of the Muddy Bridge Branch of Sawmill Creek and said that she would return my call (which she has not in the past week). Her response was that personally that she was glad that I called but that professionally this could cause some conflict. I told her that the Governor may be interested in balancing some of the poor publicity that may arise from the situation, particularly since the Sawmill Creek "Restoration" area was "chosen as one of four targeted watersheds by the Governor's Bay Work Group". This seemed to get her attention.

IV.E. NBC Radio, Washington, D.C. - Mr. Ross Simpson - (703) 413-8390
1755 S. Jefferson Davis Highway
Arlington, Virginia 22202
Fax - (703) 413-8377

Mr. Ross Simpson of NBC radio called to discuss the situation. He was particularly interested in the fact that other major airports farther north, such as Boston or Chicago, that experience more snow than BWI and do not have any deicing fluid containment, may have worse deicing stormwater runoff problems than BWI. Mr. Simpson recorded my answers concerning the inspection of the Sawmill Creek restoration area, the health effects of ethylene glycol, contacts with BWI, our contact with EPA Region III (Helen Draego), the fact that he was going to contact Mr. Larry Lubbers of the MDNR, and in general the politics of funding politicians campaigns and then "coincidentally" receiving massive construction contracts. Mr. Simpson said that he may attend the hearing for the rezoning of the "restoration" area on the 20th of March 1997. I told Mr. Simpson that I would send him a copy of my report which should be ready on Friday, 14 March 1997.

V. STORMWATER DISCHARGE PERMIT

V.A. Background

The ACA has obtained a copy of the stormwater discharge permit for BWI Airport (Attachment 5). The stormwater program under the Clean Water Act (CWA) is administered by the Maryland Department of the Environment (MDOE). The state discharge permit number is 93-DP-2546 and the National Pollutant Discharge Elimination System (NPDES) permit number is MD0063371. The permit was effective 9 May 1994. The stormwater permitting addresses non-point source surface water contamination under the CWA. Any industrial materials that are subject to contact with stormwater are regulated.

V.B. Regulatory Review

The federal Clean Water Act (CWA) regulates surface water quality for the nation. The CWA is found in 33 United States Code (USC) 1251 et seq. and the corresponding federal regulations are found under 40 Code of Federal Regulations (CFR) parts 122, 123, 124, and 125. The stormwater permit for BWI is issued to the Maryland Aviation Administration (MAA). Wetlands regulations are found in section 304 of the CWA.

V.C. Technical Review

According to the stormwater discharge permit, BWI Airport has 4 separate outfalls, 001, 003, 006, and 007 (Figure 2). According to the permit, outfalls 001 and 003 discharge to Stony Run and outfalls 006 and 007 discharge to Muddy Bridge Branch of Sawmill Creek. However, the included map shows outfalls 003 and 007 discharging to Muddy Bridge Branch of Sawmill Creek and shows outfalls 001/006 at a single discharge point that is in between a branch of Sawmill Creek and Cabin Branch. The map also shows two storm drain outfalls (307 and 306) that apparently discharge to a branch of Stony Run. The effluent limitations in the permit show that outfall 003 and 007 glycols are included as constituents for monitoring and states that outfall 007 discharges to Muddy Bridge Branch of Sawmill Creek. The permit is unclear as to which outfalls discharge to which streams.

The permit states that the stormwater permit is for discharge to, "Stoney run (outfalls 001 and 003) and Sawmill Creek (outfalls 006 and 007), and to Cabin Branch which are protected for water contact recreation, fishing, aquatic life, and wildlife in accordance with the following special and general conditions and map made a part thereof." It is immediately clear that the stormwater discharge permit is being violated by the terms of the above paragraph.

The effluent limitations listed on the outfalls 003 and 007 to Muddy Bridge Branch of Sawmill creek list: (1) flow, (2) Biological Oxygen Demand (BOD₅), ethylene glycol, propylene glycol, total glycol, total Kjeldahl Nitrogen (as N), and Total Petroleum Hydrocarbons (TPH). There are no effluent limits for these constituents and the quarterly average and daily maximum are listed as "N/A" - not applicable. The permit also states that, "The permittee shall notify the Department as soon as it is known or suspected that any toxic pollutants which are not specifically limited by this permit have been discharged at levels specified in 40 CFR Part 122.42(a)".

Section H discusses "Deicing Fluid Discharges". This section requires that a log documenting

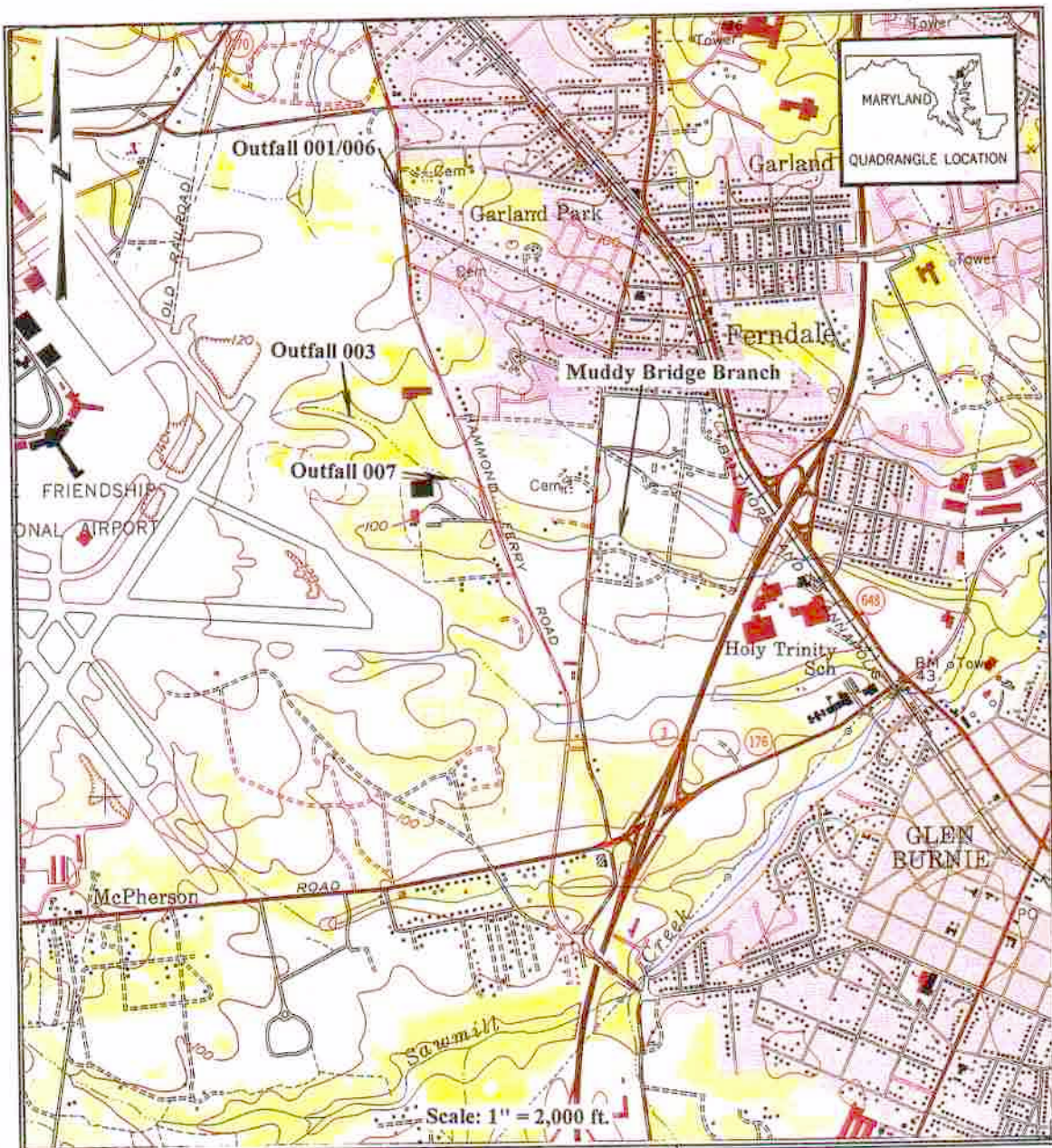


Figure 2

**Stormwater Discharge Outfalls
NPDES Permit MD0063371**

(Source: USGS Relay, Maryland Topographic Quadrangle)

March 1997

Allwood Community Association
(ACA)

monthly inspections of deicing activities. The permittee is required to "...submit to the Department for approval an operating plan to track and report to the Department the volume of deicing fluids applied at the facility and the volume of fluids which are discharged." The last phrase is particularly interesting in that according to the stormwater permit, BWI must have records of the volumes of deicing fluids discharged. It goes on to mandate implementation of deicing fluid collection facilities and "best management practices which reduce the total volume of deicing fluids discharged from the facility to 50 % (or less) of the total volume of deicing fluids applied at the facility...". The permit goes on to say that the permittee "shall perform a feasibility study and evaluate options for installing automated event based monitoring equipment at one or more outfall locations discharging deicing fluid". The ACA did not observe any automated sampling stations. However, we did not closely inspect the stormwater outfalls. The permit also mentions possible additional containment facilities, treatment facilities, recycling, or alternative deicing agents. "No later than 1 September 1996, the permittee shall submit a plan to the Department to repeat the components of the sampling and testing plan used to develop the May 7, 1993 report 'Deicing Monitoring of Winter Storm Water Events' by Maryland Environmental Service (MES)". Biomonitoring is also required at outfalls 306 and 007 (outfall 306 is apparently a storm drain on the runway southwest of the terminal). The permit requires a Stormwater Pollution Prevention Plan.

Section II, General Conditions, paragraph B, Management Requirement, item number 4 - Adverse Impact states, "The permittee shall take all reasonable steps to minimize or prevent any adverse impact to waters of the State or to human health resulting from noncompliance with any effluent limitations specified in this permit [which there are none], including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge". It is clear from the information presented in this report that the permittee has not complied with the above requirement because the watershed has been "adversely impacted".

Item 5 of the above section and paragraph addresses, "bypassing", "Any bypass of treatment facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited unless" the bypass is necessary to prevent loss of life, etc. It is possible that the high levels of glycols detected in Muddy Bridge Branch of Sawmill Creek found more than 3 weeks after a deicing event to be the result of "bypassing" discharge to the wastewater treatment. The only possible reason for a "bypass" discharge (besides convenience) is that large releases of toxic deicing fluid could negatively affect the biological treatment organisms at the wastewater treatment plant.

Paragraph C of Section II, item number 10 discusses "Property Rights/Compliance with other Requirements". "The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, State or local laws or regulations". It is clear that the citizens of the Allwood Community's property rights have been compromised due to a serious threat to human health (especially children) and reduced property values.

V.D. Summary of Stormwater Permit

The BWI Airport has been issued a stormwater discharge permit by the State of Maryland. The permit addresses deicing fluid discharges, containment, and corrective measures. It is clear from the history (although nowhere does it directly stated) that stormwater discharges of deicing fluids and other non-point source contaminants was identified as a serious pollution problem that had resulted in severe deterioration, if not death, of aquatic life in Sawmill Creek. The stormwater permit identifies the constituents present in the deicing fluids, but does not quantify any limits for these constituents. Essentially, the permit requires monitoring of stormwater events, biological monitoring, a Stormwater Pollution Prevention Plan, and corrective measures. The permit includes extensive legal discussion of potential bypasses of wastewater treatment, the need for corrective measures, and potential penalties for violating the permit. Because there are no effluent concentrations limitations, "violation" of the permit means noncompliance with stormwater monitoring, biological monitoring, the Stormwater Pollution Prevention Plan, and/or corrective measures as well as "adverse impacts" and "protection for water contact recreation, fishing, aquatic life, and wildlife". The permit does state the Sawmill Branch is "protected for water contact recreation, fishing, aquatic life, and wildlife" and that "adverse impacts" to human health or the environment are not permitted. Based on these definitions, we can only conclude that the permittee, BWI and the Maryland Aviation Administration (MAA) have violated the stormwater discharge permit. In addition, the permit does not address the deicing fluid additives.

VI. CONCLUSIONS AND RECOMMENDATIONS

VI.A. Conclusions

The conclusions that can be reached based on the information gained to date are:

- (1) Sawmill Creek, in particular Muddy Bridge Branch of Sawmill Creek, has been adversely impacted from stormwater runoff from BWI airport, mainly due to discharge of deicing fluids.
- (2) Sawmill Creek is the subject of one of the 4 watersheds in the State of Maryland chosen for the Governor of Maryland's Bay Work Group which is summarized in the attached report, "Sawmill Creek - A Multi-disciplinary Watershed Restoration Project".
- (3) The request to rezone the watershed "restoration" area from residential to industrial and pave over an existing wetlands and channelize and/or reroute Muddy Bridge Branch of Sawmill Creek is directly conflicting with the watershed restoration project.
- (4) The levels of glycols detected in Muddy Bridge Branch of Sawmill Creek are a serious human health threat, especially for children and this conclusion alone warrants corrective action. No data has been gathered concerning the levels of deicing fluid additives (dioxane, acetaldehyde, polymers, urea, corrosion inhibitors, or ethylene oxide) in surface waters, groundwater, or sediments and soils. Two of the deicing fluid additives, dioxane and acetaldehyde are known carcinogens.
- (5) A major drinking water aquifer is present directly underneath the stormwater outfalls and the contaminated surface waters and contamination of the aquifer would be disastrous for local residents.
- (6) The stormwater discharge permit granted to the MAA and BWI under the Clean Water Act (CWA) does not directly limit that amount of toxic effluent that can be discharged, but relies on studies and results of inspection and the Stormwater Pollution Prevention Plan to address adverse impacts to the local watersheds. It is clear from the data that the intent of the permit has been violated.

VI.B. Recommendations

The ACA recommends the following action to address the serious contamination detected in the Sawmill Creek watershed:

- (1) Deny rezoning of the watershed restoration area from residential to industrial. Rerouting and/or paving over the stream will further damage an already severely impacted watershed and existing wetlands.

- (2) Continue study of the Sawmill Creek watershed and implement restoration activities such as removal of debris found on the site, reduction of the volume of stormwater runoff from the airport, and most importantly, eliminate runoff of deicing fluids and toxic additives.
- (3) Place notices along the creeks warning of the contamination so that persons do not become ill from inhalation of vapors from the creek or ingestion of water from the creek. Although absorption of ethylene glycol through dermal (skin) contact is not a major route of exposure, contact with the contaminated water is not recommended. It is unknown what concentrations of deicing fluid additives may be in the surface waters, groundwater, or sediments and soils.
- (4) Sample nearby USGS wells and tap water samples to ensure that the drinking water aquifer is not contaminated with glycols and deicing fluid additives. Gather information concerning the geology of the area, the separate aquifers, and any existing monitoring data.
- (5) Obtain data from the stormwater monitoring conducted by BWI and their consultant, MES. According to the stormwater discharge permit, this data should include surface water quality data, especially after deicing events; biological monitoring data; volumes of deicing fluid used; corrective measures including the containment area and potential alternative deicing materials; and the elements contained in the Stormwater Pollution Prevention Plan. This information must be thoroughly evaluated to determine why no positive glycol results have been obtained in the past (if in fact this is so) and why the stream continues to be polluted with glycols long after a deicing event has occurred. We also need to determine whether or not BWI does in fact have a containment tank or other device. There seems to be conflicting information on what type of containment exists and where the wastewater is discharged to. The data should include the May 7, 1993 report 'Deicing Monitoring of Winter Storm Water Events' by Maryland Environmental Service (MES)" and the Stormwater Pollution Prevention Plan.
- (6) Obtain data from Maryland Industrial Enterprises (MIE) concerning the request for rezoning including wetlands delineation data, wetlands mitigation plans, or any other data pertinent to development of the watershed restoration area. It is clear that either MIE is not aware of the watershed restoration project, or they have ignored it in the hopes that no one would notice the rezoning request until it was too late to object. Evidently, MIE has submitted no wetlands mitigation plan. It is possible that MIE intends to develop the wetlands under Nationwide 26 which essentially allows development of wetlands of 1 to 10 acres without permitting or mitigation. However, Nationwide 26 was recently made more strict and will be phased out entirely.
- (7) Conduct a watershed study (which should be funded by MDE, DNR, and the MAA) to include: sampling for glycols, pH, Total Suspended Solids (TSS), Total Dissolved Solids, (TDS), Biological Oxygen Demand (BOD₅), Chemical Oxygen

Demand (COD), heavy metals, Total Petroleum Hydrocarbons (TPH), and Volatile Organic Compounds (VOCs) at sampling points in each branch of Sawmill Creek and Sawmill Creek downstream to its confluence with Furnace Branch. The monitoring should also include the deicing fluid additives dioxane, acetaldehyde, corrosion inhibitors, ethylene oxide, and polymers. A biological monitoring program should also be implemented that measures Species Diversity Indices (SDI) at several points along the streams. We suspect that the SDI of the upper reaches of Sawmill Creek will approach zero (0). The watershed study should also include evaluation of the stormwater outfalls and how they are interconnected. For example, why are there two outfalls listed (003/007 and 001/006) for each point shown on the topographic map? This may show two point discharges from collection storm drains that drain the entire airport to one location. Also, why are outfalls 306 and 307 not mentioned in the stormwater permit - what stream do these discharge to?

- (8) Sample stream sediments, wetlands sediments, and soils for deicing fluid additives. Information is needed concerning the concentrations of these additives present, the toxicity and persistence of the additives, and the biodegradation factors of the additives.
- (9) Attend the hearing on 20 March 1997 and involve as much of the public as possible. It is clear that in general the extremely rapid growth of BWI airport is having unacceptable affects on local residents.

REFERENCES

- (1) Sax, N. Irving, Dangerous Properties of Industrial Materials. 6th edition, Van Nostrand Reinhold Company, 1984.
- (2) Hartwell, S.I., Jordahl, D.M., and May, E.B, Toxicity of Aircraft De-icer and Anti-Icer Solutions to Aquatic Organisms, Maryland Department of Natural Resources Tidewater Administration, Chesapeake Bay Research and Monitoring Division, Fisheries Division, Annapolis, Maryland, May 1993.

ATTACHMENTS

Attachment 1
Sawmill Creek: A Multi-disciplinary Watershed Restoration Project

Sawmill Creek: A Multi-disciplinary Watershed Restoration Project

Larry Lubbers, Program Chief

Watershed Assessment and Targeting

Maryland Department of Natural Resources, Annapolis, MD

Abstract

The Sawmill Creek project is a comprehensive multi-agency watershed restoration effort. The goal is to demonstrate that existing programs can be coordinated in order to improve water quality, and habitat for living resources. Coordination of multiple restoration projects has been a major factor in addressing the cumulative impacts in the watershed.

Water quantity management includes reducing stormwater discharge rates and increasing stream base flow. Habitat improvement projects were designed to match the best possible stormwater discharge rates. The habitat projects include stabilizing and revegetating 1737 meters of eroded stream channels with natural materials. These projects will provide sediment and erosion control as well as restore fish, invertebrate and riparian habitat and eliminate 5 fish passage blockages.

Water quality improvements include reducing nutrient loadings through bio-retention as well as isolating and treating several types of industrial chemical discharges. Funding for most of these restoration projects has been incorporated into existing budgets for the development and maintenance of the business and community infrastructure.

Introduction

Currently most management and regulatory strategies address environmental impacts of individual land use practices. This project-by-project approach developed at a time when the cumulative impacts of human activities were far less significant. Today many agencies recognize that this approach is no longer adequate to protect or restore the Chesapeake bay or its tributaries. As a result, Sawmill Creek was chosen as one of four targeted watersheds by the Governor's Bay Work Group. These watersheds were selected in order to develop, demonstrate, and evaluate a coordinated approach to improving water quality and the habitat conditions for living resources.

Description of Sawmill Creek Watershed

Sawmill Creek is a second order freshwater stream on Maryland's coastal plain. The watershed drains approximately 8.4 square miles and the creek flows about 5 miles from its headwaters until it empties into a tidal estuary near the mouth of the Patapsco river and Baltimore Harbor. The region was originally known for its productive fruit and vegetable farms. Approximately two thirds of the watershed has been converted to residential and light industrial land uses over the past 50 years. Development of a major transportation network has had a significant effect on the watershed, with Baltimore Washington International Airport as the center of a web interconnecting rail lines and interstate highways. Ground water usage for municipal drinking water has increased dramatically. Due to excessive pumping from an unconfined aquifer, annual base flow in the creek was reduced from an average 6 cubic feet per second (cfs) to as less than 1 cfs during dry years.

Organization of the Project

At the beginning of the project two inter-agency teams were identified. The first was an overall monitoring group which immediately began to document existing biological conditions. The implementation team used the monitoring data to target restoration projects and to subsequently measure their environmental benefits.

A wide spectrum of land owners and land management agencies have contributed to the restoration efforts. Five Anne Arundel county government departments and seven state agencies have been involved in various capacities. Three federal agencies, five nongovernmental organizations, numerous private citizens and several local businesses have been participating. An important mandate was to use existing programs to achieve the restoration objectives. No new funds were allocated for implementation projects.

The implementation team used biological indicators to determine which land management activities were having the most significant impacts on the watershed. A restoration strategy was drafted which described the geographic distribution of environmental problems and explained how they had evolved during the development of the watershed. For each major environmental problem, a restoration strategy was proposed and the responsible management agencies were identified. The monitoring and planning process evolved over a 3 year period. The implementation phase began in 1994 and will continue for another 3 to 4 years.

Restoration Projects

Figure 1 shows the distribution of problems and restoration projects that were identified by the inter-agency teams. Each letter indicates a different type of project. In some areas restoration projects have been linked together in order to address cumulative impacts to water quantity, water quality, and habitat problems within specific sub-basins of the watershed.

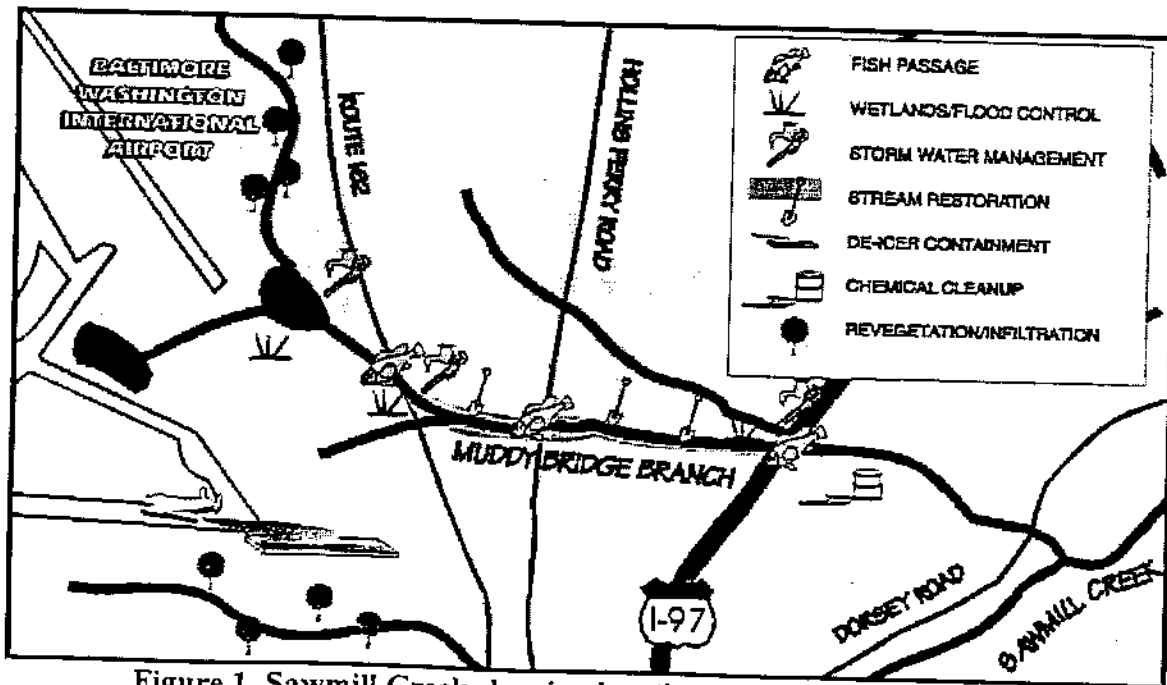


Figure 1. Sawmill Creek showing location of restoration projects.

The sub-basin known as Muddy Bridge Branch provides a good example of the cumulative impacts

of commercial and residential development. Stream habitat has been degraded by stormwater erosion, despite the presence of 4 stormwater management (SWM) basins. Additional stormwater related impacts include; degraded water quality, fish passage blockages, and sedimentation of the large pond and wetlands downstream. Runoff from airplane deicing has caused chemical oxygen demand as high as 2700 mg/l and laboratory bioassays have documented significant mortality rates in fish and invertebrates. Urea is used for runway deicing and NH₃ concentrations as high as 35 mg/l have been recorded. The loss of baseflow in this tributary has negatively impacted habitat space, temperature, dissolved oxygen, and the dilution rates of the chemical pollutants mentioned above.

Figure 2 provides a schematic of some of the coordinated restoration projects on Muddy Bridge Branch. In order to restore aquatic habitat, 1341 meters of stream channel will be stabilized using bio-engineering techniques, including tree root wads to stabilize failing banks and vortex rock weirs to provide grade control. The Rosgen stream classification system was used to design the restored channel geometry, non-erosive flow capacity, and channel cross section. All the stormwater management ponds were analyzed in order to determine the most economical way to produce a non-erosive discharge rate that would be compatible with the rebuilt stream channel dimensions.

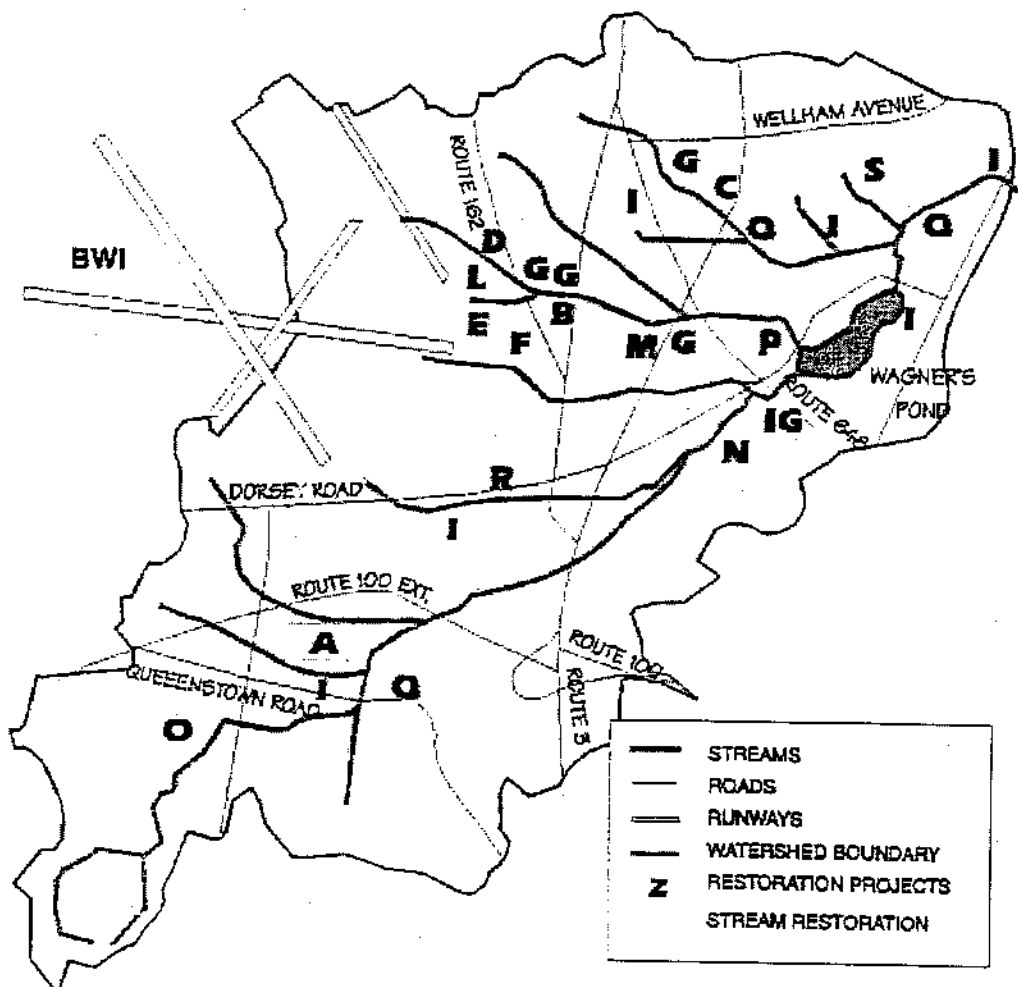


Figure 2. Muddy Bridge Branch restoration projects.

In order to achieve a more stable hydrologic regime a variety of stormwater management (SWM) techniques are being combined. The outlet structures at the airport's two largest SWM basins will be modified. Additional storage capacity will be created by raising the height of the lower

impoundment. The two year storm discharge rate will be reduced from 3.3 cubic meters per second to 1.6 cubic meters per second. Additional volume reductions will be accomplished by diverting some of the runoff from the upper SWM pond back into an adjacent drainage basin that was cut off during earlier airfield construction.

As part of their new regional stormwater management plan the MD Aviation Administration has begun to re-vegetate many of its drainage swales and open spaces. This will have several benefits including; increases in infiltration, nutrient uptake and evapo-transpiration as well as reducing runoff times of concentration and thermal loadings to the stream.

Several of the downstream road crossings are built on berms that act as unintentional detention structures during large storm events. Upland areas behind these crossings will be excavated and planted with wetlands vegetation in order to increase floodplain storage, wetland habitat, sediment trapping and nutrient assimilation.

Two of the culverts will be replaced and a third will be modified as part of local highway improvements. The new structures have been designed to restore fish passage and be compatible with the stream restoration design.

In addition to reducing high flow impacts, baseflow will be improved by phasing out several older municipal well fields within the watershed. An analysis of regional water supplies has indicated that water needs can be met more efficiently by investing in a better regional transmission line network.

Significant water quality improvements will result from the new deicer management plan at Baltimore Washington International Airport. Deicing pads, waste storage tanks, vacuum sweeper trucks, and testing of alternative deicing materials are being implemented. This is one of most extensive deicer management plans thus far at an operating US airport. Monitoring and management plans are also being developed to deal with leaking underground storage tanks at two local industrial facilities.

A number of the restoration practices described for Muddy Bridge Branch are gradually being implemented in other parts of the watershed. The EPA Rapid Bioassessment Protocols (RBP) are being used to quantify the effectiveness of a stream restoration project on Tributary 9. Post construction habitat scores have improved by 60 % within the first growing season. We expect that the habitat scores will continue to improve as the riparian plantings develop into a mature forest buffer. Nine species of fish have been stocked in this stream segment which only supported one species before the restoration project. The team is also working on plans to remove a downstream fish blockage.

Conclusion

The Sawmill Creek project is a good example of how a multi-disciplinary team can develop an ecologically sound watershed management project. The key to success was the use of quantifiable measures of biological health and stream stability to guide the integration of a wide variety of best management practices. This approach can be used for both restoration and

Health and Safety Data for Standard Car Anti-freeze

This is the information found on a standard container of anti-freeze for cars (Citgo Antifreeze Coolant)

The ingredients are listed as: ethylene glycol, diethylene glycol, dipotassium phosphate, and water.

WARNING: HARMFUL OR FATAL IF SWALLOWED

Do not drink antifreeze or solution. If swallowed, induce vomiting immediately. Call a physician. Ethylene glycol base. Do not store in open or unlabeled containers.

KEEP OUT OF REACH OF CHILDREN AND ANIMALS

Additional Precautions: Avoid inhaling mist or hot vapors. If inhaled, remove to fresh air. Overexposure may cause system depression, kidney damage and irritation. Ethylene glycol causes birth defects in laboratory animals. Wash thoroughly after handling. Solution may taste pleasant to animals, but is poisonous to them.

Attachment 2
Health and Safety Data for Ethylene Glycol

ETHYLENE DIPERCHLORATE

C₂H₄Cl₂O₈; mw: 226.96

THR: Highly sensitive, very explosive.
Incomp: Water.

ETHYLENE GLYCOL

CAS RN: 107211

NIOSH #: KW 2975000

C₂H₆O₂; mw: 62.08

Colorless, sweet-tasting liquid. Hygroscopic. bp: 197.5°,
 rel = 3.2%, fp: -13°, flash p: 232°F (CC), d: 1.113 @
 25°, autoign. temp.: 752°F, vap. d: 2.14, vap. press:
 1 mm @ 20°.

SYNS:

1. ETHYLENGLYKOL (GERMAN)
 1. HYDROXYETHANE
 1. ETHANEDIOL
 ETHYLENE ALCOHOL

GLYCOL
 GLYCOL ALCOHOL
 MONOETHYLENE GLYCOL
 NCI-C00920

TOXICITY DATA:

2-1

CODEN:

LD₅₀ (m): 100 mmol/L
 eye-irrit 12 mg/m³/3D
 skin-irrit 555 mg open MLD
 y₁₀₀ 111 mg
 y₁₀ 12 mg/m³/3D
 y₁ 1440 mg/6H MOD
 inh-dhd TDLo: 7400 mg/kg:SYS
 inh-hum LDLo: 710 mg/kg
 inh-m TDLo: 10000 mg/m³:IRR
 inh-rat LDLo: 1637 mg/kg
 inh-rat LD₅₀: 8540 mg/kg
 inh-rat LD₅₀: 5220 mg/kg
 inh-rat LD₅₀: 5300 mg/kg
 inh-rat LDLo: 2800 mg/kg
 inh-rat LDLo: 3300 mg/kg
 inh-mus LD₅₀: 7500 mg/kg
 inh-mus LDLo: 1700 mg/kg
 inh-rat LDLo: 2700 mg/kg
 inh-rat LD₅₀: 3000 mg/kg
 inh-rat LD₅₀: 2000 mg/kg
 inh-rat LDLo: 2000 mg/kg
 inh-rat LD₅₀: 19530 mg/kg
 inh-rat LDLo: 1000 mg/kg
 inh-rat LDLo: 5 gm/kg
 inh-rat LDLo: 5500 mg/kg
 inh-rat LD₅₀: 6610 mg/kg
 inh-rat LDLo: 5000 mg/kg

PAACA3 21,74,80
 TXAPA9 16,646,70
 UCDS** 7/21/65
 JPETAB 82,377,44
 TXAPA9 16,646,70
 BUYRAI 31,25,77
 PGMJAO 52,598,76
 JETOAS 9,373,76
 AGGHAR 5,1,33
 8SDCAI 2,73,70
 JIHTAB 23,259,41
 TXAPA9 21,454,72
 CTOXAO 4,185,71
 JPETAB 41,387,31
 JPETAB 41,387,31
 JPETAB 65,89,39
 PSEBAA 35,98,36
 BJIMAG 1,207,44
 JPETAB 65,89,39
 JIHTAB 21,173,39
 AGGHAR 5,1,33
 NPRI* 1,49,74
 PCOC** 1,502,66
 JPETAB 41,387,31
 JPETAB 41,387,31
 JIHTAB 23,259,41
 AIPTAK 51,398,35

Toxicity Rating: TLm96:1000-100 ppm
 WQCHM* 3,-,74

Air: 100 ppm (vapor) DTLWS* -,18,76. *Toxicology*
 mw: AJMEAZ 38,409,65. Selected by NTP Carci-
 nesis Bioassay as of December 1980. Reported in
 EPA TSCA Inventory, 1980.

MOD irr via skin, eyes and mu mem, and via oral,
 1 ip routes. (Lethal dose for man reported to be
 1 ml). If ingested it causes initial CNS stimulation
 followed by depression. Later, it causes kidney damage
 can terminate fatally. Very tox in particulate
 upon inhal.

Hazard: Slight, when exposed to heat or flame; can
 react violently with chlorosulfonic acid, oleum, H₂SO₄,
 and P₂S₅.

Low Heating: No.

Hazard: Mod, when exposed to flame.

To Fight Fire: Alcohol foam, water, foam, CO₂, dry chem-
 ical.

ETHYLENE GLYCOL BIS(2,3-EPOXY-2-METHYLPROPYL) ETHER

CAS RN: 3775857

NIOSH #: KH 5775000

mf: C₁₀H₁₈O₄; mw: 202.28

SYNS:

ETHYLENE GLYCOL DI(2,3-
 EPOXY-2-METHYLPROPYL)
 ETHER

ETHYLENE GLYCOLIDE, (2,3-
 EPOXY-2-METHYLPROPYL)
 ETHER

TOXICITY DATA:

2-1

CODEN:

skin-rbt 10 mg/24H open MLD
 orl-rat LD₅₀: 7460 mg/kg
 skin-rbt LD₅₀: 3150 mg/kg

AIHAAP 23,95,62
 AIHAAP 24,305,63
 AIHAAP 23,95,62

THR: MOD orl, skin. An irr in skin of rbt.

Disaster Hazard: When heated to decomp it emits acrid
 smoke and fumes.

ETHYLENE GLYCOL BIS(IODOACETATE)

CAS RN: 5451514

NIOSH #: AI 3560000

mf: C₆H₈I₂O₄; mw: 397.94

SYN: ETHYLENE BIS(IODOACETATE)

TOXICITY DATA:

3

CODEN:

ipr-mus LD₅₀: 16 mg/kg
 ivn-dog LD₅₀: 4940 ug/kg

JNCIAM 31,297,63
 JNCIAM 31,297,63

THR: HIGH ipr, ivn. See also iodides.

Disaster Hazard: When heated to decomp it emits tox
 fumes of I⁻.

ETHYLENE GLYCOL DIALLYL ETHER

CAS RN: 7529273

NIOSH #: KW 4200000

mf: C₈H₁₄O₂; mw: 142.22

SYN: DIALLYLETHER ETHYLENGLYKOLU (CZECH)

TOXICITY DATA:

2

CODEN:

skin-rbt 500 mg/24H SEV
 eye-rbt 250 ug/24H SEV
 orl-rat LD₅₀: 1020 mg/kg

28ZPAK -,38,72
 28ZPAK -,38,72
 28ZPAK -,38,72

Reported in EPA TSCA Inventory, 1980.

THR: MOD orl. SEV skin, eye irr.

Disaster Hazard: When heated to decomp it emits acrid
 smoke and fumes.

ETHYLENE GLYCOL DIETHYL ETHER

CAS RN: 629141

NIOSH #: KI 1225000

mf: C₈H₁₄O₂; mw: 118.20

Colorless liquid, slight ethereal odor. mp: -74°, bp:
 121.4°, flash p: 95°F (OC), d: 0.8417 @ 20°/20°, autoign.
 temp.: 406°F, vap. d: 6.56, vap. press: 9.4 mm.

SYN: DIETHYL CELLOSOLVE

TOXICITY DATA:

2-1

CODEN:

eye-rbt 17 mg
 orl-rat LD₅₀: 4390 mg/kg

AJOPAA 29,1363,46
 JIHTAB 23,259,41

DIETHYLDITHIOCARBAMIC ACID LEAD(II) SALT

CAS RN: 17549303 NIOSH #: EZ 5600000
 mf: $C_{10}H_{20}N_2S_4 \cdot Pb$; mw: 503.75

TOXICITY DATA: 2 **CODEN:**
 ipr-rat LDLo: 500 mg/kg NCNSA6 5,30,53

Occupational Exposure to Inorganic Lead recm std: Air:
 TWA 0.10 mg(Pb)/m³ NTIS**.

THR: MOD ipr. See also lead and thiocarbamates.
Disaster Hazard: When heated to decomp it emits very
 tox fumes of Pb, SO_x and NO_x.

DIETHYLDITHIOCARBAMIC ACID SELENIUM(II) SALT

CAS RN: 136925 NIOSH #: EZ 6300000
 mf: $C_{10}H_{20}N_2S_4 \cdot Se$; mw: 375.52

TOXICITY DATA: 3 **CODEN:**
 orl-rat LDLo: 250 mg/kg NCNSA6 5,40,53
 ipr-rat LDLo: 50 mg/kg NCNSA6 5,40,53

THR: HIGH orl, ipr. See also selenium compounds and
 carbamates.

Disaster Hazard: When heated to decomp it emits very
 tox fumes of NO_x, SO_x and Se.

DIETHYLENE GLYCOL

CAS RN: 111466 NIOSH #: ID 5950000
 mf: $C_4H_{10}O_3$; mw: 106.14

Clear, colorless, practically odorless, syrupy liquid. bp:
 245.8°, fp: -8°, flash p: 255°F, d: 1.1184 @ 20°/20°,
 autoign. temp.: 444°F, vap. press: 1 mm @ 91.8°, vap.
 d: 3.66.

SYNS:

BIS(2-HYDROXYETHYL) ETHER
 DIGLYCOL
 BETA,BETA'-DIHYDROXYDI-
 ETHYL ETHER
 ETHYLENE DIGLYCOL

GLYCOL ETHYL ETHER
 3-OXAPENTANE-1,5-DIOL
 3-OXA-1,5-PENTANEDIOL
 2,2'-OXYBIETHANOL
 2,2'-OXYDIETHANOL

TOXICITY DATA: 3 **CODEN:**

sk-hmn 112 mg/3D-I MLD
 eye-rbt 50 mg MLD
 orl-rat TDLo: 890 gm/kg/53W-
 C:CAR

85DKA8 -,127,77
 JPETAB 42,355,31
 JIHTAB 28,40,46

orl-hmn LD50:1000 mg/kg
 orl-rat LD50:14800 mg/kg
 ipr-rat LD50:6565 mg/kg
 orl-mus LD50:23700 mg/kg
 orl-mus LCLo:130 mg/m³/2H
 orl-mus LDLo:5 gm/kg
 orl-dog LD50:9000 mg/kg
 orl-cat LD50:3300 mg/kg
 orl-rbt LD50:11890 mg/kg
 ipr-rbt LD50:2000 mg/kg
 orl-rat LD50:7800 mg/kg

JHTAB 21,173,39
 FEPRA7 4,142,45
 NPIRI* 1,25,74
 FEPRA7 4,142,45
 GTPZAB 10,30,66
 JPETAB 42,355,31
 JPETAB 67,101,39
 JIHTAB 21,173,39
 NPIRI* 1,24,74
 JPETAB 59,93,37
 FEPRA7 4,142,45

Aquatic Toxicity Rating: Tlm96:over 1000 ppm
 WQCHM* 3,-,74.

Toxicology Review: AJMEAZ 38,409,65; ADCSAJ
 13,271,70. Reported in EPA TSCA Inventory, 1980.

THR: A hmn skn irr; An eye irr (exper). An exper CARC.

A MOD hmn; HIGH ihl. MOD orl, ivn; LOW orl,
 ivn, scu, skn. See also ethers.

Fire Hazard: Slight, when exposed to heat or flame; can
 react with oxidizing materials.

Spontaneous Heating: No.

To Fight Fire: Alcohol foam, water, CO₂, dry chemical.

Disaster Hazard: When heated to decomp it emits acrid
 smoke and irr fumes.

DIETHYLENE GLYCOL DI(3-AMINOPROPYL) ETHER

CAS RN: 4246519 NIOSH #: ID 6475000

TOXICITY DATA: 2-1 **CODEN:**
 orl-rat LD50:4290 mg/kg AIHAAP 30,470,69
 skn-rbt LD50:2500 mg/kg AIHAAP 30,470,69

Reported in EPA TSCA Inventory, 1980.

THR: MOD skn; LOW orl. See also ethers.

Disaster Hazard: When heated to decomp it emits tox
 fumes of NO_x.

DIETHYLENE GLYCOL DIBENZOATE

CAS RN: 120558 NIOSH #: ID 6650000
 mf: $C_{18}H_{18}O_5$; mw: 314.36

Cryst; fp: 70°; bp: 210°; flash p: 365°F; vap d: 9.38.

SYNS:

BENZOIC ACID, DIESTER WITH DI- DIBENZOYLDIETHYLENEGLYCOL
 ETHYLENE GLYCOL ESTER

TOXICITY DATA: 2 **CODEN:**
 orl-rat LD50:2830 mg/kg AIHAAP 23,95,62

Reported in EPA TSCA Inventory, 1980. EPA TSCA
 8(a) Preliminary Assessment Information Proposed
 Rule FERREAC 45,13646,80.

THR: MOD via oral route. See also glycols.

Fire Hazard: Slight, when exposed to heat or flame; can
 react with oxidizing materials.

To Fight Fire: Water, foam, CO₂, dry chemical.

DIETHYLENE GLYCOL DIGLYCIDYL ETHER

CAS RN: 4206615 NIOSH #: KN 2330000
 mf: $C_{10}H_{18}O_5$; mw: 218.28

SYN: BIS(2-(2,3-EPOXYPROPOXY)ETHYL)ETHER

TOXICITY DATA: 3 **CODEN:**
 cyt-rat-ipr 1 mg/kg BJPCAL 6,235,51

THR: HIGH ipr.

Disaster Hazard: When heated to decomp it emits acrid
 smoke and irr fumes.

DIETHYLENE GLYCOL DINITRATE

CAS RN: 693210 NIOSH #: ID 6825000
 mf: $C_4H_8N_2O_7$; mw: 196.14

Liquid. vap. d: 6.76.

HEALTH EFFECTS ASSESSMENTS SUMMARY TABLE A: SUBCHRONIC AND CHRONIC TOXICITY (OTHER THAN CARCINOGENICITY)
 Update: December, 1990

Compound	Exposure		Species	Effect of Concern		Inhalation RfC [mg/m ³ (mg/kg/day)]	Oral RfD (mg/kg/day)	Uncertainty Factor		Reference
	Inhalation	Oral		Inhalation	Oral			Inhalation	Oral	
S-Ethyl dipropylthiocarbamate										
(EPTC)										
subchronic	NA; 50 ppm in diet for 2 generations (2.5 mg/kg/day)		rat	NA; degenerative cardiomyopathy		ND	2.5E-2	NA	100	NA/PP3 Inducties, 1986; U.S. EPA, 1984, 1990
chronic	NA; 50 ppm in diet for 2 generations (2.5 mg/kg/day)		rat	NA; degenerative cardiomyopathy		ND	2.5E-2 ^a	NA	100	NA/PP3 Inducties, 1986; U.S. EPA, 1984, 1990
Ethylene cyanohydrin										
subchronic	NA; 30 mg/kg/day in drinking water for 90 days		rat	NA; decreased heart and brain weights		ND	3E-1	NA	100	U.S. EPA, 1988/ Sauerhoff et al., 1976; U.S. EPA, 1988
chronic	NA; 30 mg/kg/day in drinking water for 90 days		rat	NA; decreased heart and brain weights		ND	3E-1	NA	100	U.S. EPA, 1988/ Sauerhoff et al., 1976; U.S. EPA, 1988
Ethylene diamine										
subchronic	59 ppm (145 mg/m ³) 7 hours/day, 5 days/week for 30 days (25.8 mg/kg/day); 3-month dietary study with 50 mg/kg/day ethylenediamine dihydrochloride (22.6 mg ethylenediamine/kg/day)		rat	death, kidney and liver lesions; liver and hematologic changes		1E+0 (3E-1)	2E-1	100	100	Pozzani and Carpenter, 1954; U.S. EPA, 1988/ Yang et al., 1983; U.S. EPA, 1983; U.S. EPA, 1988
chronic	NA; 3-month dietary study with 50 mg/kg/day ethylenediamine dihydrochloride (22.6 mg ethylenediamine/kg/day)		rat	NA; liver and hematologic changes		ND	2E-2	NA	1000	U.S. EPA, 1988/ Yang et al., 1983; U.S. EPA, 1988
Ethylene glycol										
subchronic	NA; 200 mg/kg/day in developmental toxicity		rat	NA; fetotoxicity		ND	2E+0 ^{aa}	NA	100	U.S. EPA, 1987/ Maronpot et al., 1983; U.S. EPA, 1987

HEALTH EFFECTS ASSESSMENTS SUMMARY TABLE A: SUBCHRONIC AND CHRONIC TOXICITY (OTHER THAN CARCINOGENICITY)
 Update: December, 1990

Compound	Exposure	Species		Effect of Concern	Inhalation RfC [mg/m ³ (mg/kg/day)] ¹	Oral RfD (mg/kg/day)	Uncertainty Factor	Reference
		Inhalation	Oral					
4-Ethyl-o-xylene								
DATA INADEQUATE FOR QUANTITATIVE RISK ASSESSMENT								
Fluoranthene subchronic	NA; 125 mg/kg/day by Savage for 90 days	NA	mouse	NA: nephropathy, liver weight changes, hematolog- ical changes	ND	4E-1	NA	300 NA/U.S. EPA, 1988
	chronic	NA	mouse	NA: nephropathy, liver weight changes, hematolog- ical changes ¹	ND	4E-2 ^a	NA	3000 NA/U.S. EPA, 1988, 1990
Fluorane subchronic	NA; 125 mg/kg/day by Savage for 13 weeks	NA	mouse	NA: hematological changes (decreased RBC)	ND	4E-1	NA	300 NA/U.S. EPA, 1989
	chronic	NA	mouse	NA: hematological changes (decreased RBC) ¹	ND	4E-2 ^a	NA	3000 NA/U.S. EPA, 1989, 1990
Fluorides subchronic	NA; 0.06 mg fluoride/kg/ day in drinking water	NA	human	NA: dental fluorosis at higher levels	ND	6E-2	NA	1 U.S. EPA, 1989/ Hodge, 1950; U.S. EPA, 1989, 1990
	chronic	NA	human	NA: dental fluorosis at higher levels	ND	6E-2 ^a	NA	1 U.S. EPA, 1989/ Hodge, 1950; U.S. EPA, 1989, 1990
Fluridone subchronic	NA; 200 ppm in the diet for 2 years (8 mg/kg/ day)	NA	rat	NA: kidney and testes	ND	8E-2	NA	100 NA/ELL Lilly and Co., 1980; U.S. EPA, 1984 1990
	chronic	NA	rat	NA: kidney and testes	ND	8E-2 ^a	NA	100 NA/ELL Lilly and Co., 1980; 1984 U.S. EPA, 1984 1990
Folpet subchronic	NA; 10 mg/kg/day in capsules for 1 year	NA	dog	NA: body weight gain, blood chemistry	ND	1E-1	NA	100 NA/Chevron Chemical Corp., 1986; U.S. EPA, 1984, 1990

Substance	[CAS #]	ADOPTED VALUES			
		TWA		STEL	
		ppm ^(a)	mg/m ^{3(b)}	ppm ^(a)	mg/m ^{3(b)}
•Dimethyl carbamoyl chloride [79-44-7] (1978)		A2	A2	—	—
Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate, see Naled					
•Dimethylformamide [68-12-2] — Skin (1986)		10	30	—	—
2,6-Dimethyl-4-heptanone, see Diisobutyl ketone					
‡••1,1-Dimethylhydrazine [57-14-7] — Skin (1976)		(0.5, A2)	(1.2, A2)	—	—
Dimethylnitrosamine, see N-Nitrosodimethylamine					
Dimethylphthalate [131-11-3] (1986)		—	5	—	—
•Dimethyl sulfate [77-78-1] — Skin (1977)		0.1, A2	0.52, A2	—	—
Dinitolmide [148-01-6] (1976)		—	5	—	—
•Dinitrobenzene [528-29-0; 99-65-0; 100-25-4] (all isomers) — Skin (1986)		0.15	1.0	—	—
Dinitro-o-cresol [534-52-1] — Skin (1986)		—	0.2	—	—
3,5-Dinitro-o-toluamide, see Dinitolmide					
••Dinitrotoluene [25321-14-6] — Skin (1986)		—	1.5	—	—
••Dioxane [123-91-1] — Skin (1986)		25	90	—	—
•Dioxathion [78-34-2] — Skin (1977)		—	0.2	—	—
Diphenyl, see Biphenyl					
Diphenylamine [122-39-4] (1986)		—	10	—	—
Diphenylmethane diisocyanate, see Methylene bisphenyl isocyanate					
Dipropylene glycol methyl ether [34590-94-8] — Skin (1976)		100	606	150	909
Dipropyl ketone [123-19-3] (1981)		50	233	—	—
Diquat [85-00-7] (1986)		—	0.5	—	—
•Di-sec-octyl phthalate [117-81-7] (1976)		—	5	—	10
Disulfiram [97-77-8] (1986)		—	2	—	—
Disulfoton [298-04-4] (1986)		—	0.1	—	—
2,6-Di-tert-butyl-p-cresol [128-37-0] (1987)		—	10	—	—
Diruron [330-54-1] (1977)		—	10	—	—
Divinyl benzene [1321-74-0] (1980)		10	53	—	—
Emery [1302-74-5] (1986)		—	10 ^(c)	—	—

Substance	[CAS #]	ADOPTED VALUES			
		TWA		STEL	
		ppm ^(a)	mg/m ^{3(b)}	ppm ^(a)	mg/m ^{3(b)}
Endosulfan [115-29-7] — Skin (1986)		—	0.1	—	—
Endrin [72-20-8] — Skin (1988)		—	0.1	—	—
Enflurane [13838-16-9] (1988)		75	566	—	—
Enzymes, see Subtilisins					
‡••Epichlorohydrin [106-89-6] — Skin (1986)		(2)	(7.6)	—	—
•EPN [2104-64-5] — Skin (1986)		—	0.5	—	—
1,2-Epoxypropane, see Propylene oxide					
2,3-Epoxy-1-propanol, see Glycidol					
Ethane [74-84-0] (1981)		— ^(c)	—	—	—
Ethanesithiol, see Ethyl mercaptan					
Ethanol, see Ethyl alcohol					
Ethanolamine [141-43-5] (1978)		3	7.5	6	15
•Ethion [563-12-2] — Skin (1977)		—	0.4	—	—
•2-Ethoxyethanol (EGEE) [110-80-5] — Skin (1984)		5	18	—	—
2-Ethoxyethyl acetate (EGEEA) [111-15-9] — Skin (1984)		5	27	—	—
Ethyl acetate [141-78-6] (1977)		400	1440	—	—
•Ethyl acrylate [140-88-5] (1990)		5, A2	20, A2	15, A2	61, A2
Ethyl alcohol [64-17-5] (1977)		1000	1880	—	—
Ethylamine [75-04-7] (1977)		10	18	—	—
Ethyl amyl ketone [541-85-5] (1977)		25	131	—	—
•Ethyl benzene [100-41-4] (1976)		100	434	125	543
‡Ethyl bromide [74-96-4] (1976)		(200)	(891)	(250)	(1110)
Ethyl butyl ketone [106-35-4] (1987)		50	234	—	—
Ethyl chloride [75-00-3] (1986)		1000	2640	—	—
Ethylene [74-85-1] (1981)		— ^(c)	—	—	—
Ethylene chlorohydrin [107-07-3] — Skin (1977)		C 1	C 3.3	—	—
Ethylenediamine [107-15-3] (1977)		10	25	—	—
•Ethylene dibromide [106-93-4] — Skin (1982)		A2	A2	—	—
•Ethylene dichloride [107-06-2] (1986)		10	40	—	—
Ethylene glycol [107-21-1] Vapor and mist (1981)		C 50	C 127	—	—
•Ethylene glycol dinitrate [628-96-6] — Skin (1985)		0.05	0.31	—	—
Ethylene glycol methyl ether acetate, see 2-Methoxyethyl acetate					
•Ethylene oxide [75-21-8] (1984)		1, A2	1.8, A2	—	—

21 C = Ceiling Limit =
50 ppm

ACGI -- 1990-91

TLV

BEI

Attachment 3
Results of Surface Water Sampling for Glycols



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

Ed Russell
Allwood Community Association

Laboratory Number 307-02-0117-001
Respectfully Submitted:

ACA 1 AND ACA 2
SAMPLES OF DEICING RUNOFF FROM SWI

Date Sampled 02/08/97 11:20
Date Received 02/10/97

S. Curran
R022097 1100

Sampled by CLIENT

ANALYSIS FOR REQUESTED PARAMETERS
ALL RESULTS ARE REPORTED ON AN AS RECEIVED BASIS

PARAMETER	RESULT	MDL	UNIT	METHOD	ANALYZED
					DATE/TIME/ANALYST
Propylene Glycol	2000	500	mg/L	SW8015	02/14/97 17:09 DP
Ethylene Glycol [107-21-1]	660	500	mg/L	SW8015	02/14/97 17:09 DP
Diethylene Glycol [111-46-6]	29	25	mg/L	SW8015	02/14/97 17:09 DP

ND - Not Detected at a concentration greater than the MDL (Method Detection Limit).

REF: USEPA; Test Methods for Evaluating Solid Waste; SW-846, 3rd Ed.; Nov. 1986.

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4440 Glen Este-Withamsville Road, Suite 900, Cincinnati, OH 45245-1331 — Tel: (513) 752-9696 Fax: (513) 752-2614

ENVIRONMENTAL FACILITIES IN ALASKA, CALIFORNIA, FLORIDA, ILLINOIS, MARYLAND, MICHIGAN, MISSOURI, NEW JERSEY, OHIO, WEST VIRGINIA



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

Ed Russell
Allwood Community Association

Laboratory Number 307-02-0117-002
Respectfully Submitted:

ACA 3 AND ACA 4
SAMPLES OF DEICING RUNOFF FROM SWI

Date Sampled 02/08/97 13:20
Date Received 02/10/97

Sampled by CLIENT

R022097 1100

ANALYSIS FOR REQUESTED PARAMETERS
ALL RESULTS ARE REPORTED ON AN AS RECEIVED BASIS

PARAMETER	RESULT	MDL	UNIT	METHOD	ANALYZED
					DATE/TIME/ANALYST
Propylene Glycol	2200	25	mg/L	SW8015	02/14/97 17:34 DP
Ethylene Glycol [107-21-1]	710	25	mg/L	SW8015	02/14/97 17:34 DP
Diethylene Glycol [111-46-6]	ND	25	mg/L	SW8015	02/14/97 17:34 DP

ND - Not Detected at a concentration greater than the MDL (Method Detection Limit).

REF: USEPA; Test Methods For Evaluating Solid Waste; SW-846, 3rd Ed.; Nov. 1986.

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ENVIRONMENTAL FACILITIES IN ALASKA, CALIFORNIA, FLORIDA, ILLINOIS, MARYLAND, MICHIGAN, MISSOURI, NEW JERSEY, OHIO, WEST VIRGINIA



CHAIN OF CUSTODY RECORD
CT&E Environmental Services Inc.
 Laboratory Division

- California
- Florida
- Illinois
- Maryland
- Michigan
- New Jersey
- Ohio
- Pennsylvania
- West Virginia

CLIENT: *Millwood Community Association*

CONTACT: *Joe Bussard* PHONE NO: *410-746-7887*

PROJECT: *Supplier of Drinking Water from*

REPORTS TO: *Will Pickens (Paul Bussard)*

INVOICE TO: *Same as above* FAX NO: 1

LAB NO. SAMPLE IDENTIFICATION DATE TIME MATRIX

LAB NO.	SAMPLE IDENTIFICATION	DATE	TIME	MATRIX
	<i>ACH1 AQA4</i>	<i>1/19/07</i>	<i>11:20</i>	<i>2</i>
	<i>ACH2 AQA4</i>	<i>1/19/07</i>	<i>11:20</i>	<i>2</i>

CT&E Reference: *307-02-0117-* PAGE *1* OF *1*

No.	CONTAINERS	SAMPLE TYPE	Preservation Used	Analysis Required	REMARKS
		<i>C= COMP G= GRAB</i>	<i>(3)</i>		<i>GYNOLS</i>

Collected / Relinquished By: (1) *Paul Bussard* Date: *1/19/07* Time: *9:58* Received By: *Will Pickens*

Relinquished By: (2) _____ Date: _____ Time: _____ Received By: _____

Relinquished By: (3) _____ Date: _____ Time: _____ Received By: _____

Relinquished By: (4) _____ Date: _____ Time: _____ Received For Laboratory By: _____

Shipping Carrier: _____ Samples Received Cold? (Circle) YES NO

Shipping Ticket No: _____ Temperature °C: _____

Data Deliverables Required: Level I Level II Level III Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Requested Turnaround Time and Special Instructions: *Client paid \$80.00 in cash 2/20/07*

SCORUM

Attachment 4
Photographs of Site Inspection by Allwood Community Association (ACA)
2 March 1997

Photo #1 - View of Sawmill Creek Downstream of Hollins Ferry Road (looking east)
(Note white foam)



Photo #2 - View of Sawmill Creek Downstream of Hollins Ferry Road (looking north)
(Note white foam)



Photo #3 - View of Sign Requesting Change of Zoning from Residential to Industrial (Looking South)



Photo #4 - Discarded 55-Gallon Drum (Looking south)



Photo #5 - Various Debris (on south border of site)



**Photo #6 - View of Painted Trees and Survey Markers (for wetlands delineation)
(Looking east towards Hollins Ferry Road)**



Photo #7 - View of Sawmill Creek at Aviation Boulevard (Looking south)



**Photo #8 - View of Wetlands between BWI Airport and Aviation Boulevard
(Looking west) (Note mallard ducks)**



Photo 9 - Various Debris (tires, trash) (Looking east)



Photo #10 - Tracks of Vehicle that Apparently Cleared Brush on "Restoration" Area



Attachment 5
Stormwater Discharge Permit for BWI Airport



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

Ed Russell
Allwood Community Association

Laboratory Number 307-03-0013-001

Respectfully
Submitted:

ACA-3 GRAB

Date Sampled 02/24/97 15:00

Date Received 03/03/97

S. Cooney
030397 1632

Sampled by CLIENT

ANALYSIS FOR REQUESTED PARAMETERS
ALL RESULTS ARE REPORTED ON AN AS RECEIVED BASIS

PARAMETER	RESULT	MDL	UNIT	METHOD	ANALYZED
					DATE/TIME/ANALYST
Propylene Glycol	ND	25	mg/L	SUB015	03/03/97 13:29 DP2
Ethylene Glycol [107-21-1]	ND	25	mg/L	SUB015	03/03/97 13:29 DP2
Diethylene Glycol [111-46-6]	ND	25	mg/L	SUB015	03/03/97 13:29 DP2

REF: USEPA; Test Methods For Evaluating Solid Waste; SW-846, 3rd Ed.; Nov. 1986.

ND - Not Detected at a concentration greater than the MDL (Method Detection Limit).

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4440 Glen Este-Withamsville Road, Suite 900, Cincinnati, OH 45245-1331 — Tel: (513) 752-9696 Fax: (513) 752-2614

ENVIRONMENTAL FACILITIES IN ALASKA, CALIFORNIA, FLORIDA, ILLINOIS, MARYLAND, MICHIGAN, MISSOURI, NEW JERSEY, OHIO, WEST VIRGINIA



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

Ed Russell
Allwood Community Association

Laboratory Number 307-03-0013-003
Respectfully Submitted:

ACA-5 GRAB

Date Sampled 03/01/97 16:00
Date Received 03/03/97

S. Crum
030397 1632

Sampled by CLIENT

ANALYSIS FOR REQUESTED PARAMETERS
ALL RESULTS ARE REPORTED ON AN AS RECEIVED BASIS

PARAMETER	RESULT	MDL	UNIT	METHOD	ANALYZED
					DATE/TIME/ANALYST
Propylene Glycol	120	25	mg/L	SW8015	03/03/97 14:20 DP
Ethylene Glycol [107-21-1]	ND	25	mg/L	SW8015	03/03/97 14:20 DP
Diethylene Glycol [111-46-63]	ND	25	mg/L	SW8015	03/03/97 14:20 DP

REF: USEPA; Test Methods For Evaluating Solid Waste; SW-846, 3rd Ed.; Nov. 1986.

ND - Not Detected at a concentration greater than the MDL (Method Detection Limit).

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4643 Benson Avenue, Baltimore, MD 21227-1410 — Tel: (410) 247-7400 Fax: (410) 247-7402
4440 Glen Este-Withamsville Road, Suite 900, Cincinnati, OH 45245-1331 — Tel: (513) 752-9696 Fax: (513) 752-2814

ENVIRONMENTAL FACILITIES IN ALASKA, CALIFORNIA, FLORIDA, ILLINOIS, MARYLAND, MICHIGAN, MISSOURI, NEW JERSEY, OHIO, WEST VIRGINIA



CT&E Environmental Services Inc.

Laboratory Division

Laboratory Analysis Report

Ed Russell
Allwood Community Association

Laboratory Number 307-03-0013-002
Respectfully Submitted:

ACA-4 GRAB

Date Sampled 03/01/97 15:30
Date Received 03/03/97

L. Cowm
030397 1632

Sampled by CLIENT

ANALYSIS FOR REQUESTED PARAMETERS
ALL RESULTS ARE REPORTED ON AN AS RECEIVED BASIS

PARAMETER	RESULT	MDL	UNIT	METHOD	ANALYZED
					DATE/TIME/ANALYST
Propylene Glycol	120	25	mg/L	SW8015	03/03/97 13:55 DP
Ethylene Glycol [107-21-1]	ND	25	mg/L	SW8015	03/03/97 13:55 DP
Diethylene Glycol [111-46-6]	ND	25	mg/L	SW8015	03/03/97 13:55 DP

REF: USEPA; Test Methods For Evaluating Solid Waste; SW-846, 3rd Ed.; Nov. 1986.

ND - Not Detected at a concentration greater than the MDL (Method Detection Limit).

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ENVIRONMENTAL FACILITIES IN ALASKA, CALIFORNIA, FLORIDA, ILLINOIS, MARYLAND, MICHIGAN, MISSOURI, NEW JERSEY, OHIO, WEST VIRGINIA

CHAIN OF CUSTODY RECORD

CT&E Environmental Services Inc.

Laboratory Division

- Alaska
 Missouri
 California
 New Jersey
 Florida
 Ohio
 Pennsylvania
 West Virginia
 Maryland
 Michigan
 Montana
 Nevada

1 CLIENT: Allwood Comm. Assoc. PHONE NO: () SITE:

CONTACT: Ed Russell FAX NO: ()

PROJECT:

REPORTS TO:

INVOICE TO:

P.O. NUMBER:

CT&E Reference: 307-03-0013- PAGE OF

2 CONTAINERS

No.	SAMPLE TYPE	Preservatives Used	Analysis Required	REMARKS
1	G		X	
2	G		X	* Save 1 via
2	G		X	# Save 1 via

4 Shipping Carrier: Samples Received Cold? (Circle) YES NO

Shipping Ticket No: Temperature °C:

Data Deliverables Required Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Level I Level II Level III

Requested Turnaround Time and Special Instructions: ACT-4 and ACT-5 sampled by A. Scott McDuell

Data	Time	Received By:
<u>3/1/97</u>	<u>12:45</u>	<u>Ed Russell</u>

5 Collected / Relinquished By: (1) Ed Russell

Relinquished By: (2)

Relinquished By: (3)

Relinquished By: (4)

4643 Blanson Avenue Baltimore, MD 21227 Tel: (410) 247-7400 Fax: (410) 247-7402 White - Retained by Lab (Project File) Yellow - Returned with Report Pink - Retained by Sampler

MAR 03 '97 09:03AM MINERALS OIL AND GAS DIV



MARYLAND DEPARTMENT OF THE ENVIRONMENT
2500 Broening Highway • Baltimore, Maryland 21224
(410) 631-3000

William Donald Schafer
Governor

David A.C. Carroll
Secretary

STATE DISCHARGE PERMIT NUMBER	93-DP-2546
NPDES PERMIT NUMBER	MDO063371
EFFECTIVE DATE	May 9, 1994
EXPIRATION DATE	May 8, 1999

Pursuant to the provisions of Title 9 of the Environment Article, Annotated Code of Maryland and regulations promulgated thereunder and the provisions of the Clean Water Act, 33 U.S.C. § 1251 et seq. and implementing regulations 40 CFR Parts 122, 123, 124, and 125, the Department of the Environment, hereinafter referred to as the "Department", hereby authorizes

Maryland Aviation Administration
P.O. Box 8766
BWI Airport, Maryland 21240

TO DISCHARGE FROM

a public airport

LOCATED AT

Maryland Route 45, Friendship, Anne Arundel County, Maryland

VIA OUTFALLS

001, 003, 006, 007 and other storm water point sources referred to herein

TO

Stoney Run (outfalls 001 and 003) and Sawmill Creek (outfalls 006 and 007), and to Cabin Branch which are protected for water contact recreation, fishing, aquatic life, and wildlife in accordance with the following special and general conditions and map made a part hereof.

→ all outfalls or just Cabin Branch

Permit Number: 93-OP-2546
 Page Number: 2

I. SPECIAL CONDITIONS

A.1. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge wastewater from the Fire-Rescue Training Facility and storm water via Outfall 001.

As specified below, wastewater from the Fire-Rescue Training Facility shall be limited and monitored by the permittee at Monitoring Point 101, the exit pipe from the oil separator to the pond.

- what pond?

EFFLUENT CHARACTERISTICS EFFLUENT LIMITATIONS MONITORING REQUIREMENTS

	<u>(lbs/day)</u>		<u>Other Units (Specify)</u>		<u>Measurement Frequency</u>	<u>Sample Type</u>
	<u>Quarterly Average</u>	<u>Daily Maximum</u>	<u>Quarterly Average</u>	<u>Daily Maximum</u>		
Flow	N/A	N/A	" (gpd)	" (gpd)	1/Month	Estimated
Total Petroleum Hydrocarbons	N/A	N/A	N/A	15 mg/l	1/Month ^b	Grab

The pH shall not be less than 6.0 nor greater than 9.0 and shall be monitored once per month^b by grab sample.

There shall be no discharge of floating solids or persistent foam in other than trace amounts; persistent foam is foam that does not dissipate within one half-hour of point of discharge.

- ^b Monitoring required without limits. ?
- ^b During discharge from fire fighting training exercises.

Permit Number: 93-OP-2546
 Page Number: 3

1. SPECIAL CONDITIONS

A-2. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge storm water runoff from the main fuel terminal via Outfall 00J.

As specified below, such discharge shall be limited and monitored by the permittee at: Monitoring Point 301 - 48" concrete pipe to ditch; Monitoring Point 302 - 15" concrete pipe from final oil separator; Monitoring Point 303 - 24" pipe next to NP 302.

EFFLUENT CHARACTERISTICS EFFLUENT LIMITATIONS MONITORING REQUIREMENTS

	<u>(lbs/day)</u>		<u>Other Units (Specify)</u>		<u>Measurement Frequency</u>	<u>Sample Type</u>
	<u>Quarterly Average</u>	<u>Daily Maximum</u>	<u>Quarterly Average</u>	<u>Daily Maximum</u>		
Flow	N/A	N/A	" (gpd)	" (gpd)	1/Month	Estimated
Total Petroleum Hydrocarbons	N/A	N/A	20 mg/l	30 mg/l	1/Month	Grab

There shall be no discharge of floating solids or persistent foam in other than trace amounts. Persistent foam is foam that does not dissipate within one half-hour of point of discharge.

" Monitoring required without limits.

Permit Number: 93-DP-2546
 Page Number: 4

I. SPECIAL CONDITIONS

A.3. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge storm water runoff from the general aviation fuel terminal via Outfall 006.

As specified below, such discharge shall be limited and monitored by the permittee at Monitoring Point 601, the 6" pipe from the oil water separator.

	<u>EFFLUENT CHARACTERISTICS</u>			<u>EFFLUENT LIMITATIONS</u>			<u>MONITORING REQUIREMENTS</u>		
	<u>(lbs/day)</u>			<u>Other Units (Specify)</u>			<u>Measurement Frequency</u>	<u>Sample Type</u>	
<u>Flow</u>	<u>Quarterly Average</u>	<u>Daily Maximum</u>	<u>Quarterly Average</u>	<u>Daily Maximum</u>	<u>Other Units (Specify)</u>	<u>Estimated</u>			
Total Petroleum Hydrocarbons	N/A	N/A	20 mg/l	30 mg/l	" (gpd)	1/Month ¹	Grab		

There shall be no discharge of floating solids or persistent foam in other than trace amounts. Persistent foam is foam that does not dissipate within one half-hour of point of discharge.

¹ Monitoring required without limits.

² The permittee shall sample during wet weather discharges.

*1 time or distance
downstream?*

Permit Number: 93-DP-2546
 Page Number: 5

SPECIAL CONDITIONS

A.4. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Beginning on the effective date of the permit and lasting through the expiration date, the permittee is authorized to discharge storm water runoff via Outfall 003 and Outfall 007.

As specified below, such discharge shall be monitored by the permittee at: Monitoring Point 306 (also called SMP-1), the exit from a 60" reinforced concrete pipe outfall which discharges runoff from the main terminal to the headwaters of Kitten Branch; Monitoring Point 307 (also called "P"), the exit of a 48" pipe to Kitten Branch discharging runway and parking area drainage; Monitoring Point 703 (also called SMP-3), discharging from the upper storm water management pond to the lower pond via the exit of a 60" pipe; and Outfall 007 (also called SNP-4), the discharge from the lower of two storm water management ponds prior to entering the headwaters of Muddy Bridge Branch. *--- this upper*

EFFLUENT CHARACTERISTICS

What about Summit Creek, Wavy Creek

EFFLUENT LIMITATIONS (lbs/day)

MONITORING REQUIREMENTS

	Quarterly Average	Daily Maximum	Quarterly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow	N/A	N/A	" ⁶ (gpd)	" ⁶ (gpd)	1/Month	Estimated ⁶
BOD ₅	N/A	N/A	" ⁶ (mg/l)	" ⁶ (mg/l)	1/Month	Grab
Ethylene glycol	N/A	N/A	" ⁶ (mg/l)	" ⁶ (mg/l)	1/Month	Grab
Propylene glycol	N/A	N/A	" ⁶ (mg/l)	" ⁶ (mg/l)	1/Month	Grab
Total glycol	N/A	N/A	" ⁶ (mg/l)	" ⁶ (mg/l)	1/Month	Grab
Total Kjeldahl Nitrogen (as N)	N/A	N/A	" ⁶ (mg/l)	" ⁶ (mg/l)	1/Month	Grab
Total Petroleum Hydrocarbons	N/A	N/A	" ⁶ (mg/l)	" ⁶ (mg/l)	1/Month	Grab

MONTH 1

The pH shall be monitored once per month⁶ by grab sample.

There shall be no discharge of floating solids or persistent foam in other than trace amounts. Persistent foam is foam that does not dissipate within one half-hour of point of discharge.

⁶ Monitoring required without limits. Samples shall be collected during storm water discharges.

⁶ Measured flows required at Outfall 007. During the first 90 days after permit issuance, estimated flows may be submitted in lieu of measured flow values.

⁶ Monitoring required without limits. Monitoring not required during June through September. No monitoring is required at Monitoring Point 307 until such time that centralized deicing activities are located in its drainage area. All samples shall be collected during storm water discharges associated with deicing events, during the period of highest concentration of deicing chemicals, if possible.

Permit Number: 93-DP-2546
Page Number: 6

I. SPECIAL CONDITIONS

B. DEFINITIONS

1. The "monthly, quarterly, semi-annual, or annual average" effluent concentration means the value calculated by computing the arithmetic mean of all the daily determinations of concentration made during any calendar-month, 3-month, 6-month, or 12-month period respectively.
2. The "daily maximum" effluent concentration means the highest reading of any daily determination of concentration.
3. "Daily determination of concentration" means one analysis performed on any given sample representing flow during a calendar day, with one number in mg/l or other appropriate units as an outcome.
4. "Grab Sample" means an individual sample collected in less than 15 minutes. Grab samples collected for pH and total residual chlorine shall be analyzed within 15 minutes of time of sample collection.
5. "Solvent" is defined as an organic substance capable of dissolving another to form a uniformly dispersed mixture. Organic solvents include, but are not limited to, aromatic hydrocarbons, aliphatic hydrocarbons, esters, ethers, ketones, amines, and nitrated and chlorinated hydrocarbons.
6. The "minimum" value means the lowest value measured during a 24-hour period.
7. "Bypass" means the intentional diversion of wastes from any portion of a treatment facility.
8. "Upset" means the 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. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
9. "Estimated" flow means a calculated volume or discharge rate which is based on a technical evaluation of the sources contributing to the discharge including, but not limited to, pump capabilities, water meters, and batch discharge volumes.
10. "Measured" flow means any method of liquid volume measurement the accuracy of which has been previously demonstrated in engineering practice, or for which a relationship to absolute volume has been obtained.
11. "Total Petroleum Hydrocarbons" is the test method defined under EPA Method 418.1. Samples shall be collected directly into a 1-liter, wide-mouth jar with inert cap liner and preserved with HCl to a pH of <2. Maximum holding time at 4°C shall be 28 days.

C. TOXIC POLLUTANT REPORTING

The permittee shall notify the Department as soon as it is known or suspected that any toxic pollutants which are not specifically limited by this permit have been discharged at levels specified in 40 CFR Part 122.42(a).

D. REMOVED SUBSTANCES

1. Within 90 days of the effective date of the permit, unless already submitted with the application, the permittee shall submit to the Department on a form provided, the following information:

Permit Number: 93-DP-2546
Page Number: 7

- a. Locate, on a suitable map, all areas used for the disposal of any removed substances as defined by General Condition B.7;
 - b. The physical, chemical, and biological characteristics (as appropriate), quantities of any removed substances handled, and the method of disposal;
 - c. If disposal is handled by other than the permittee, identify the contractor or subcontractor, their mailing address, and the information specified in a and b above.
2. Prior to the use of new or additional disposal areas, contractors, or subcontractors, the permittee shall notify the Department in writing.

E. WASTEWATER OPERATOR CERTIFICATION

Within six months from the date of issuance of this permit, the permittee's facility shall be operated by an industrial wastewater operator duly certified by the Maryland Board of Waterworks and Waste Systems Operators. At no time during the effect of this permit shall the treatment facilities be operated for more than six months without a certified operator.

F. ANALYTICAL LABORATORY

Within 30 days of the effective date of this permit the permittee shall submit to the Department the name and address of the analytical laboratory (including the permittee's own laboratory) which is used to perform the monitoring required by this permit.

If the laboratory changes during the life of the permit, the permittee shall notify the Department of the new laboratory within 30 days of the change.

G. OTHER AUTHORIZED DISCHARGES

1. In addition to the discharges authorized under Special Condition A, the permittee is authorized to discharge storm water associated with industrial activity (i.e. aircraft or ground vehicle maintenance, equipment cleaning operations, and deicing operations) according to the facility's Storm Water Pollution Prevention Plan.
2. Except for the following non-storm water discharges and the wastewater specifically identified in Special Conditions A1-A4, non-storm water discharges to the storm sewer system are prohibited: lawn watering; routine external building washdown which does not use detergents or other compounds; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

H. DEICING FLUID DISCHARGES

1. The permittee shall perform monthly inspections, as a minimum, of deicing activities throughout the airport and maintain a log recording the results of each inspection and any corrective actions required. The permittee shall implement a set of tracking and follow-up procedures to ensure that appropriate actions are taken in response to the inspections. Deicing activities which are not authorized in the permittee's Best Management Practices Plan shall be reported in writing to the Department within five working days.
2. Within 60 days after the effective date of the permit, the permittee shall submit to the Department for approval an operating plan to track and report to the Department the volume of deicing fluids applied at the facility and the volume of fluids which are discharged. As a part of the plan, the permittee shall require all users of deicing fluids to

Permit Number: 93-DP-2546
Page Number: 9

Outfall 007 (also known as SMP-4) by using biomonitoring. The study plan should include a discussion of:

- a. wastewater and production variability
 - b. sampling methods
 - c. source of test organisms
 - d. source of dilution water
 - e. testing procedures
 - f. data analysis
 - g. quality control
 - h. testing schedule
2. The testing program shall consist of at least one acute toxicity test annually at both locations. This testing shall be initiated during the first deicing season after approval of the study plan. Each testing event shall include a 48-hour static renewal test using fathead minnow and a 48-hour static renewal test using a daphnid species.
 3. The samples used for biomonitoring shall be collected at the same time as the samples used for the chemical analysis required for these outfalls.
 4. Testing shall be conducted in accordance with the procedures described in Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, September 1991, EPA/600/4-90/027.
 5. Test results shall be submitted to the Department within one month of completion of each set of tests.
 6. Test results shall be reported in accordance with MDE/WMA "Reporting Requirements for Effluent Biomonitoring Data" (8/28/92).
 7. If testing is not performed in accordance with a Department approved study plan, additional testing may be required by the Department.
 8. If the test results indicate that the effluent is toxic, additional biomonitoring or a toxicity reduction evaluation may be required by the Department.
 9. If plant processes or operations change so that there is a significant change in the nature of the wastewater, the Department may require the permittee to conduct a new set of tests.
 10. Submit all biomonitoring related materials to:

Maryland Department of the Environment
Water Management Administration
Water Quality Program
2500 Broening Highway
Baltimore, Maryland 21224

J. TOXICITY REDUCTION EVALUATION

The permittee shall conduct a Toxicity Reduction Evaluation (TRE) when a review of toxicity test data by the Department indicates unacceptable acute or chronic effluent toxicity. A TRE is an investigation conducted to identify the causative agents of effluent toxicity, isolate the source(s), determine the effectiveness of control options, implement the necessary control measures and then confirm the reduction in toxicity.

1. Within 90 days of notification by the Department that a TRE is required, the permittee shall submit a plan of study and schedule for conducting a TRE. The permittee shall conduct the TRE study consistent with the submitted plan and schedule.

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2. This plan should follow the framework presented in Generalized Methods for Conducting Industrial Toxicity Reduction Evaluations (EPA/600/2-88/070).
3. Beginning 60 days from the submission date of the TRE study plan and every 60 days thereafter, the permittee shall submit progress reports including all relevant test data to the Department. This shall continue until completion of the toxicity reduction confirmation.
4. Within 60 days of completion of the toxicity identification, or the source identification phase of the TRE, the permittee shall submit to the Department a plan and schedule for implementing those measures necessary to eliminate acute toxicity and/or reduce chronic toxicity to acceptable levels. The implementation of these measures shall begin immediately upon submission of this plan.
5. Within 60 days of completing the implementation of the control measures to eliminate or reduce toxicity, the permittee shall submit to the Department for approval a study plan to confirm the elimination or reduction of toxicity by using biomonitoring.
6. If, for any reason, the implemented measures do not result in compliance with the Department's toxicity limitations, the permittee shall continue the TRE.

X. STORM WATER DISCHARGES ASSOCIATED WITH INDUSTRIAL ACTIVITY

1. Storm Water Pollution Prevention Plans - General

The permittee shall develop a storm water pollution prevention plan for each area of the facility with point source discharges of storm water associated with industrial activity. Only those portions of the facility that are either involved in aircraft or ground vehicle maintenance (including aircraft or ground vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, or deicing operations are addressed under this requirement.

- a. The storm water pollution prevention plan shall be prepared in accordance with sound engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit.
- b. The permittee shall ensure that the development and implementation of the storm water pollution prevention plan includes areas of the facility occupied by tenants of the airport who conduct operations which result in storm water discharges associated with industrial activity. For the purposes of this permit, tenants of the airport facility include airline companies, fixed based operators and other parties which have contracts with the airport authority to conduct business operations on airport property which result in storm water discharges associated with industrial activity.
- c. In developing this plan, the permittee shall use as a reference "Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices" or, when it is available, an EPA-published summary document on the same subject. These documents can be obtained from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161 (phone: 703-487-4500).

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- d. The plan shall be signed in accordance with II.C.18, and be retained on site in accordance with II.C.1 of this permit. The plan shall be completed within one year of the date of issuance of this permit. The permittee shall then comply with the terms of the plan within 18 months of the date of issuance of this permit. The permittee shall make plans available upon request to the Department, and in the case of a storm water discharge associated with industrial activity which discharges to a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system.
- e. If the plan is reviewed by the Department, the Department may notify the permittee, at any time, that the plan does not meet one or more of the minimum requirements of this Part. After such notification from the Department, the permittee shall make changes to the plan to meet the objections of the Department and shall submit to the Department a written certification that the requested changes have been made. Unless otherwise provided by the Department, the permittee shall have 90 days after such notification to make the necessary changes.
- f. The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance which has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the storm water pollution prevention plan proves to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Amendments to the plan may be reviewed by the Department in the same manner as 1.d above.

2. Storm Water Pollution Prevention Plan - Contents

The plan shall include, at a minimum, the following items:

a. Description of Potential Pollutant Sources

The plan shall provide a description of potential sources which may be reasonably expected to add significant amounts of pollutants to storm water discharges. The plan shall identify all activities and significant materials which may potentially be significant pollutant sources. The plan shall include:

- i. A site map indicating an outline of the drainage area of each storm water outfall; each existing structural control measure to reduce pollutants in storm water runoff; and surface water bodies, including drainage ditches and wetlands. The location of the following activities where such activities are exposed to precipitation shall also be included: aircraft and runway deicing/anti-icing operations; fueling stations; aircraft, ground vehicle and equipment maintenance and/or cleaning areas; storage areas for aircraft, ground vehicles and equipment awaiting maintenance; loading/unloading areas; locations used for the treatment, storage or disposal of wastes (including but not limited to oil separators), liquid storage tanks, processing areas and storage areas.
- ii. A topographic map (or other map, if a topographic map is unavailable), extending one-quarter of a mile beyond the property boundaries of the facility. The requirements of this condition may be included in the site map required under 2.a.i. above, if appropriate.
- iii. A narrative description of significant materials that have been treated, stored, or disposed in a manner which allowed exposure to storm water at anytime from three years prior to the date of the issuance of this permit and until the time

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the present method of on-site storage or disposal was initiated; materials management practices employed to minimize contact of these materials with storm water runoff; materials loading and access areas; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

- iv. For each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow, and an estimate of the types of pollutants which are likely to be present in storm water discharges associated with industrial activity; and
- v. A summary of all existing sampling data describing pollutants in storm water discharges.

b. Storm Water Management Controls

The permittee shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

- i. Preventive Maintenance. A preventive maintenance program that involves timely inspection and maintenance of storm water management devices (cleaning oil/water separators, catch basins) as well as inspecting and testing plant equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters.
- ii. Good Housekeeping. Good housekeeping that requires the maintenance of a clean, orderly facility.
 - (a) Aircraft, Ground Vehicle and Equipment Maintenance Areas. The plan must describe measures that prevent or minimize the contamination of the storm water runoff from all areas used for aircraft, ground vehicle and equipment maintenance (including the maintenance conducted on the terminal apron and in dedicated hangars). Special attention shall be given to the maintenance hangars at General Aviation. Management practices such as performing maintenance activities indoors, maintaining an organized inventory of materials used in the maintenance areas, draining all parts of fluids prior to disposal, preventing the practice of hosing down the apron or hangar floor, using dry cleanup methods, and/or collecting the storm water runoff from the maintenance area and providing treatment or recycling should be considered.
 - (b) Aircraft, Ground Vehicle and Equipment Cleaning Areas. The plan must describe measures that prevent or minimize the contamination of the storm water runoff from all areas used for aircraft, ground vehicle and equipment cleaning. Management practices such as performing cleaning operations indoors, and/or collecting the storm water runoff from the cleaning area and providing treatment or recycling should be considered.

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- (c) Aircraft, Ground Vehicle and Equipment Storage Areas. The storage of aircraft, ground vehicles and equipment awaiting maintenance must be confined to designated areas (delineated on the site map). The plan must describe measures that prevent or minimize the contamination of the storm water runoff from these areas. Management practices such as indoor storage of aircraft and ground vehicles, the use of drip pans for the collection of fluid leaks, and perimeter drains, dikes or berms surrounding storage areas should be considered.
- (d) Material Storage Areas. Storage units of all materials (e.g., used oils, hydraulic fluids, spent solvents, and waste aircraft fuel) must be maintained in good condition, so as to prevent or minimize contamination of storm water, and plainly labeled (e.g., "used oil," "Contaminated Jet A," etc.). The plan must describe measures that prevent or minimize contamination of the storm water runoff from storage areas. Management practices such as indoor storage of materials, centralized storage areas for waste materials, and/or installation of berming and diking around storage areas should be considered for implementation.
- (e) Airport Fuel System and Fueling Areas. The plan must describe measures that prevent or minimize the discharge of fuels to the storm sewer resulting from fuel servicing activities or other operations conducted in support of the airport fuel system. Where the discharge of fuels into the storm sewer cannot be prevented, the plan shall indicate measures that will be employed to prevent or minimize the discharge of the contaminated runoff into receiving surface waters. Management practices such as implementing spill and overflow practices (e.g., placing sorptive materials beneath aircraft during fueling operations), using dry cleanup methods, and/or collecting the storm water runoff should be considered. Special attention shall be given to fueling operations at General Aviation.
- iii. Spill Prevention and Response Procedures. If spills have a potential to occur, procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a cleanup should be available to the appropriate personnel.
- iv. Sediment and Erosion Prevention. The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures to limit erosion.
- v. Management of Runoff. The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the generation or source(s) of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures determined to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity (see 2.a. - description of potential pollutant sources) shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: vegetative

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swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, and wet detention/retention devices. In addition, the following specific areas of concern shall be addressed:

- (a) The condition of the upper storm water management basin in the Muddy Bridge Branch drainage system. The plan shall address the presence of any deposits of oil-soaked sediment in the bottom of the basin and consider removal of the sediments, retro-fitting the basin with an oil and grease trap, construction of an access road, and a regular inspection and maintenance plan.
 - (b) Reduction of drainage flow rates into Muddy Bridge Branch. The plan shall include an implementation schedule to achieve reductions in storm water drainage rates from the facility to Muddy Bridge Branch through retrofitting both of the on-line ponds to reduce storm flows and completion of Runway 10-28 improvements redirecting drainage into Irving Branch.
 - (c) Sediment and erosion along the lower segment of Kitten Branch. The plan shall address any channel erosion occurring in the stream bank and channel walls where drainage from the facility enters the stream.
- vi. Visual Inspections. Qualified plant personnel shall be identified to inspect designated equipment and plant areas. Material handling areas shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. A tracking or follow-up procedure shall be used to ensure that appropriate response has been taken in response to the inspection. Records of inspections shall be maintained at the facility, for a minimum of three years. This period shall be automatically extended during the course of litigation, or when requested by the Department.
 - vii. Recordkeeping and Internal Reporting Procedures. Incidents, such as spills or other discharges, along with other information describing the quality and quantity of storm water discharges shall be included in the records. Inspections and maintenance activities shall be documented and recorded.
- c. Comprehensive Site Compliance Evaluation
A site inspection shall be conducted annually by appropriate responsible personnel to verify that the description of potential pollutant sources required under 2.a. is accurate, the drainage map has been updated to reflect current conditions, and the controls to reduce pollutants identified in the storm water pollution prevention plan are being implemented and are adequate. Records documenting significant observation made during the site inspection shall be retained as part of the storm water pollution prevention plan for three years.
 - d. Consistency with Other Plans
Storm water management programs may include requirements for Spill Prevention Control and Countermeasure (SPCC) plans under Section 311 of the Clean Water Act or Best Management Practices (BMPs) programs otherwise required by an NPDES permit and may incorporate any part of such plans into the storm water pollution prevention plan by reference.

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e. Special Requirements for Storm Water Discharges Associated with Industrial Activity to Municipal Separate Storm Sewer Systems Serving a Population of 100,000 or More

The permittee shall comply with applicable requirements in municipal storm water management programs developed under NPDES permits issued for the discharge of the municipal separate storm sewer system that receives the facility's discharge, provided the discharger has been notified of such conditions. The permittee shall make storm water pollution prevention plans available to the municipal operator of the system upon request.

f. Salt Storage

Storage piles of salt used for deicing or other commercial or industrial purposes shall be enclosed or covered to prevent exposure to precipitation.

g. Pollution Prevention Committee

The description of the storm water Pollution Prevention Committee shall identify specific individuals within the plant organization who are responsible for developing the storm water pollution prevention plan and assisting the plant manager in its implementation, maintenance, and revision. The activities and responsibilities of the committee should address all aspects of the facility's storm water pollution prevention plan.

h. Employee Training

Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics, such as spill response, good housekeeping and material management practices. A pollution prevention plan shall identify periodic dates for such training.

3. Storm Water Pollution Prevention Plan - Additional Requirements for Facilities Subject to SARA Title III, Section 313 Requirements

Storm water pollution prevention plans for facilities subject to reporting requirements under SARA Title III, Section 313 (42 U.S.C. §11023) are required to include, in addition to the information listed in condition 2., a discussion of the facility's conformance with the following appropriate guidelines:

- a. In areas where Section 313 water priority chemicals are stored, processed or otherwise handled, appropriate containment, drainage control and/or diversionary structures shall be provided. At a minimum, one of the following preventive systems or its equivalent shall be used:
 - i. Curbing, culverting, gutters, sewers or other forms of drainage control to prevent or minimize the potential for storm water runoff to come into contact with significant sources of pollutants; or
 - ii. Roofs, covers, or other forms of appropriate protection to prevent storage piles from exposure to storm water and wind.
- b. The storm water pollution prevention plan shall include a complete discussion of measures taken to conform with the following applicable guidelines, other effective storm water pollution prevention procedures, and applicable State rules, regulations, and guidelines.

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- i. Liquid storage areas where storm water comes into contact with any equipment, tank, container, or other vessel used for Section 313 water priority chemicals. No tank or container shall be used for the storage of a Section 313 water priority chemical unless its material and construction are compatible with the material stored and conditions of storage, such as pressure and temperature, etc. Liquid storage areas for Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include secondary containment provided for at least the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation, a strong spill contingency and integrity testing plan, and/or other equivalent measures.
- ii. Material storage areas for Section 313 water priority chemicals other than liquids. Material storage areas for section 313 water priority chemicals other than liquids which are subject to runoff, leaching, or wind blowing shall incorporate drainage or other control features which will minimize the discharge of Section 313 water priority chemicals. Drainage control shall minimize storm water contact with Section 313 water priority chemicals.
- iii. Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals. Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 water priority chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include: the placement and maintenance of drip pans (including the proper disposal of materials collected in the drip pans) where spillage may occur (such as hose connections, hose reels and filler nozzles) for use when making and breaking hose connections; a strong spill contingency and integrity testing plan; and/or other equivalent measures.
- iv. In plant areas where Section 313 water priority chemicals are transferred, processed or otherwise handled. Piping, processing equipment and materials handling equipment shall be designed and operated so as to prevent discharges of section 313 chemicals. Materials used in piping and equipment shall be compatible with the substances handled. Additional protection, such as covers or guards to prevent wind blowing, spraying or releases from pressure relief vents from causing a discharge of Section 313 water priority chemicals to the drainage system shall be provided, as appropriate, to control the releases.
- v. Discharges from secondary containment areas.
 - (a) Drainage from secondary containment shall be restrained by valves or other positive means to prevent a spill or other excessive leakage of Section 313 water priority chemicals into the drainage system. After a visual inspection of the storm water and determination that no product is present, containment areas may be emptied by pumps or ejectors; however, these shall be manually activated.
 - (b) Flapper-type drain valves shall not be used to drain containment areas. Valves used for the drainage of containment areas shall, as far as is practical, be of manual, open-and-close design.

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- (c) Records of the frequency and estimated volume (in gallons) of discharges from containment areas shall be kept, at the facility, for a minimum of three years.
- (d) If facility drainage is not engineered as above, the final discharge of all in-facility storm sewers shall be equipped to be equivalent with a diversion system that could, in the event of an uncontrolled spill of Section 313 water priority chemicals, return the spilled material to the facility.
- (e) Facility site runoff other than from areas covered by (i), (ii), (iii) or (iv). Other areas of the facility [those not addressed in paragraphs (i), (ii), (iii) or (iv)], from which runoff which may contain Section 313 water priority chemicals or spills of Section 313 water priority chemicals could cause a discharge shall incorporate the necessary drainage or other control features to prevent discharge of spilled or improperly disposed material and ensure the mitigation of pollutants in runoff or leachate.

c. Facility Security

Facilities shall have the necessary security systems to prevent accidental or intentional entry which could cause a discharge. Security systems shall be described in the plan and address fencing, lighting, vehicular traffic control, and securing of equipment and buildings.

d. Risk Identification and Assessment/Material Inventory

The storm water pollution prevention plan shall assess the potential of various sources at the plant to contribute pollutants to storm water discharges associated with industrial activity. The plan shall include an inventory of the types of materials handled. Facilities shall include in the plan a description of releases to land or water of SARA Title III water priority chemicals that have occurred at any time after July 1, 1989. Each of the following shall be evaluated for the reasonable potential for contributing pollutants to runoff: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and on-site waste disposal practices. Factors to consider include the toxicity of chemicals; quantity of chemicals used, produced, or discharged; the likelihood of contact with storm water; and history of significant leaks or spills of toxic or hazardous pollutants.

II. GENERAL CONDITIONS

A. MONITORING AND REPORTING

1. REPRESENTATIVE SAMPLING

Samples and measurements taken as required herein shall be taken at such times as to be representative of the quantity and quality of the discharges during the specified monitoring periods.

2. REPORTING-MONITORING RESULTS SUBMITTED QUARTERLY

Monitoring results obtained during the calendar quarter shall be summarized on a Discharge Monitoring Report form (EPA No. 3320-1). For each effluent characteristic monitored at a frequency of once per month or less, the results obtained during the reporting period shall be summarized on a single report form for each quarter. More frequently monitored effluent characteristics shall be reported on a separate form for each calendar month of the reporting period. Results shall be

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II. GENERAL CONDITIONS

A. MONITORING AND REPORTING

submitted to the Department postmarked no later than the 28th day of the month following the end of the reporting period. Calendar quarter reporting periods end on the last day of the following months: March, June, September and December.

The reports shall be submitted to:

Maryland Department of the Environment
Water Management Administration
Inspection and Compliance Program
2500 Broening Highway
Baltimore, Maryland 21224

3. SAMPLING AND ANALYSIS METHODS

The analytical and sampling methods used shall conform to procedures for the analysis of pollutants as identified in Title 40 CFR Part 136 - "Guidelines Establishing Test Procedures for the Analysis of Pollutants" unless otherwise specified.

4. DATA RECORDING REQUIREMENTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

- a. the exact place, date, and time of sampling or measurement;
- b. the person(s) who performed the sampling or measurement;
- c. the dates and times the analyses were performed;
- d. the person(s) who performed the analyses;
- e. the analytical techniques or methods used; and
- f. the results of all required analyses.

5. MONITORING EQUIPMENT MAINTENANCE

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation to insure accuracy of measurements.

6. ADDITIONAL MONITORING BY PERMITTEE

If the permittee monitors any pollutant, using approved analytical methods as specified above, at the locations designated herein more frequently than required by this permit, the results of such monitoring, including the increased frequency, shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report form (EPA No. 3320-1).

7. RECORDS RETENTION

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and original recordings from continuous monitoring instrumentation shall be retained for a minimum of three years. This period shall be automatically extended during the course of litigation, or when requested by the Department.

B. MANAGEMENT REQUIREMENTS

1. CHANGE IN DISCHARGE

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit at a level in excess of that authorized shall constitute a violation of the terms and conditions of this permit. Anticipated

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facility expansions, production increases or decreases, or process modifications, which will result in new, different, or an increased discharge of pollutants, shall be reported by the permittee by submission of a new application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the Department. Following such notice, the permit may be modified by the Department to specify and limit any pollutants not previously limited.

2. NONCOMPLIANCE WITH EFFLUENT LIMITATIONS

If, for any reason, the permittee does not comply with or will be unable to comply with any daily maximum or daily minimum effluent limitation specified in this permit, the permittee shall notify the Inspection and Compliance Program by telephone at (410) 631-3510 within 24 hours of becoming aware of the noncompliance. Within five calendar days, the permittee shall provide the Department with the following information in writing:

- a. a description of the noncomplying discharge including its impact upon the receiving waters;
- b. cause of noncompliance;
- c. anticipated time the condition of noncompliance is expected to continue or if such condition has been corrected, the duration of the period of noncompliance;
- d. steps taken by the permittee to reduce and eliminate the noncomplying discharge;
- e. steps to be taken by the permittee to prevent recurrence of the condition of noncompliance; and
- f. a description of the accelerated or additional monitoring by the permittee to determine the nature and impact of the noncomplying discharge.

3. FACILITIES OPERATION

All treatment, control and monitoring facilities, or systems installed or used by the permittee, are to be maintained in good working order and operated efficiently.

4. ADVERSE IMPACT

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to waters of the State or to human health resulting from noncompliance with any effluent limitations specified in this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

5. HYPASSING

Any bypass of treatment facilities necessary to maintain compliance with the terms and conditions of this permit is prohibited unless:

- a. the bypass is unavoidable to prevent a loss of life, personal injury or substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources;

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- b. there are no feasible alternatives;
- c. notification is received by the Department within 24 hours (if orally notified, then followed by a written submission within five calendar days of the permittee's becoming aware of the bypass). Where the need for a bypass is known (or should have been known) in advance, this notification shall be submitted to the Department for approval at least ten calendar days before the date of bypass or at the earliest possible date if the period of advance knowledge is less than ten calendar days; and
- d. the bypass is allowed under conditions determined by the Department to be necessary to minimize adverse effects.

6. CONDITIONS NECESSARY FOR DEMONSTRATION OF AN UPSET

An upset shall constitute an affirmative defense to an action brought for noncompliance with technology-based effluent limitations only if the permittee demonstrates, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

- a. an upset occurred and that the permittee can identify the specific cause(s) of the upset;
- b. the permitted facility was at the time being operated in a prudent and workman-like manner and in compliance with proper operation and maintenance procedures;
- c. the permittee submitted a 24-hour notification of upset in accordance with the reporting requirements of General Condition II.B.2 above;
- d. the permittee submitted, within five calendar days of becoming aware of the upset, documentation to support and justify the upset; and
- e. the permittee complied with any remedial measures required to minimize adverse impact.

7. REMOVED SUBSTANCES

Wastes such as solids, sludges, or other pollutants removed from or resulting from treatment or control of wastewaters, or facility operations, shall be disposed of in a manner to prevent any removed substances or runoff from such substances from entering or from being placed in a location where they may enter the waters of the State.

8. POWER FAILURE

In order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

- a. provide an alternative power source sufficient to operate the wastewater collection and treatment facilities or,
- b. halt, reduce or otherwise control production and all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater collection and treatment facilities.

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II. GENERAL CONDITIONS

C. RESPONSIBILITIES

1. RIGHT OF ENTRY

The permittee shall permit the Secretary of the Department, the Regional Administrator for the Environmental Protection Agency, or their authorized representatives, upon the presentation of credentials to:

- a. enter upon the permittee's premises where an effluent source is located or where any records are required to be kept under the terms and conditions of this permit;
- b. access and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;
- c. inspect, at reasonable times, any monitoring equipment or monitoring method required in this permit;
- d. inspect, at reasonable times, any collection, treatment, pollution management, or discharge facilities required under this permit; and
- e. sample, at reasonable times, any discharge of pollutants.

2. TRANSFER OF OWNERSHIP OR CONTROL OF FACILITIES

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the permit may be transferred to another person if:

- a. the permittee notifies the Department in writing, of the proposed transfer;
- b. a written agreement, indicating the specific date of proposed transfer of permit coverage and acknowledging responsibilities of current and new permittees for compliance with the liability for the terms and conditions of this permit, is submitted to the Department; and
- c. neither the current permittee nor the new permittee receive notification from the Department, within 30 calendar days, of intent to modify, revoke, reissue or terminate the existing permit.

3. REAPPLICATION FOR A PERMIT

At least 180 calendar days before the expiration date of this permit, unless permission for a later date has been granted by the Department, the permittee shall submit a new application for a permit or notify the Department of the intent to cease discharging by the expiration date. In the event that a timely and sufficient reapplication has been submitted and the Department is unable, through no fault of the permittee, to issue a new permit before the expiration date of this permit, the terms and conditions of this permit are automatically continued and remain fully effective and enforceable.

4. AVAILABILITY OF REPORTS

Except for data determined to be confidential under Section 308 of the Clean Water Act, 33 U.S.C. § 1318, all submitted data shall be available for public inspection at the offices of the Department and the Regional Administrator of the Environmental Protection Agency.

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II. GENERAL CONDITIONS

C. RESPONSIBILITIES

5. PERMIT MODIFICATION

A permit may be modified by the Department upon written request of the permittee and after notice and opportunity for a public hearing in accordance with and for the reasons set forth in 40 CFR § 122.62 and 122.63.

6. PERMIT MODIFICATION, SUSPENSION, OR REVOCATION

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked and reissued in whole or in part during its term for causes including, but not limited to, the following:

- a. violation of any terms or conditions of this permit;
- b. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts;
- c. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; or
- d. a determination that the permitted discharge poses a threat to human health or welfare or to the environment and can only be regulated to acceptable levels by permit modification or termination.

7. TOXIC POLLUTANTS

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such toxic effluent standard or prohibition) is established by the U.S. Environmental Protection Agency, or pursuant to Section 9-314 of the Environment Article, Annotated Code of Maryland, for a toxic pollutant which is present in the discharges authorized herein and such standard is more stringent than any limitation upon such pollutant in this permit, this permit shall be revoked and reissued or modified in accordance with the toxic effluent standard or prohibition and the permittee so notified. Any effluent standard established in this case for a pollutant which is injurious to human health is effective and enforceable by the time set forth in the promulgated standard, even absent permit modification.

8. OIL AND HAZARDOUS SUBSTANCES PROHIBITED

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibility, liability, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act (33 U.S.C. § 1321), or under the Annotated Code of Maryland.

9. CIVIL AND CRIMINAL LIABILITY

Except as provided in permit conditions on "bypassing," "upset," and "power failure," nothing in this permit shall be construed to preclude the institution of any legal action nor relieve the permittee from civil or criminal responsibilities and/or penalties for noncompliance with Title 9 of the Environment Article, Annotated Code of Maryland or any federal, local, or other state law or regulation.

Permit Number: 93-DP-2546
Page Number: 23II. GENERAL CONDITIONSC. RESPONSIBILITIES10. PROPERTY RIGHTS/COMPLIANCE WITH OTHER REQUIREMENTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

11. SEVERABILITY

The provisions of this permit are severable. If any provisions of this permit shall be held invalid for any reason, the remaining provisions shall remain in full force and effect. If the application of any provision of this permit to any circumstances is held invalid, its application to other circumstances shall not be affected.

12. WATER CONSTRUCTION AND OBSTRUCTION

This permit does not authorize the construction or placing of physical structures, facilities, or debris, or the undertaking of related activities in any waters of the State.

13. COMPLIANCE WITH WATER POLLUTION ABATEMENT STATUTES

The permittee shall comply at all times with the provisions of the Environment Article, Title 7, Subtitle 2 and Title 9, Subtitle 3 of the Annotated Code of Maryland and the Clean Water Act, 33 U.S.C. § 1251 et seq.

14. ACTION ON VIOLATIONS

The issue or reissue of this permit does not constitute a decision by the State not to proceed in administrative, civil, or criminal action for any violations of State law or regulations occurring before the issue or reissue of this permit, nor a waiver of the State's right to do so.

15. CIVIL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to civil penalties for violations of State water pollution control laws set forth in Section 9-342 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that any person who violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act or in a permit issued under Section 404 of the Act, is subject to a civil penalty not to exceed \$25,000 per day for each violation.

16. CRIMINAL PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

In addition to criminal penalties for violations of State water pollution control laws set forth in Section 9-343 of the Environment Article, Annotated Code of Maryland, the Clean Water Act provides that:

- a. any person who negligently violates Section 301, 302, 306, 307, 308, 318, or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than one (1) year, or by both.

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II. GENERAL CONDITIONS

C. RESPONSIBILITIES

- b. any person who knowingly violates Section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than three (3) years, or by both.
- c. any person who knowingly violates Section 301, 302, 306, 307, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under Section 402 of the Act, or in a permit issued under Section 404 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, is subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both.
- d. any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with or renders inaccurate any monitoring device or method required to be maintained under the Act, is subject to a fine of not more than \$10,000 or by imprisonment for not more than two (2) years, or by both.

17. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

18. SIGNATORY REQUIREMENTS

All applications, reports, or information submitted to the Director shall be signed and certified as required by 40 CFR 122.22.

19. REOPENER CLAUSE FOR PERMITS

This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301, 304, and 307 of the Clean Water Act (33 USCS §§ 1311, 1314, 1317) if the effluent standard or limitation so issued or approved:

- a. contains different conditions or is otherwise more stringent than any effluent limitation in this permit or
- b. controls any pollutant not limited in this permit. This permit, as modified or reissued under this paragraph, shall also contain any other requirements of the Act then applicable.

D. AUTHORITY TO ISSUE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS

On September 5, 1974, the Administrator of the U.S. Environmental Protection Agency approved the proposal submitted by the State of Maryland for the operation of a permit program for discharges into navigable waters pursuant to Section 402 of the Clean Water Act, 33 U.S.C. Section 1342.

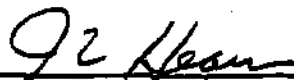
Permit Number: 93-DP-2546
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II. GENERAL CONDITIONS

C. RESPONSIBILITIES

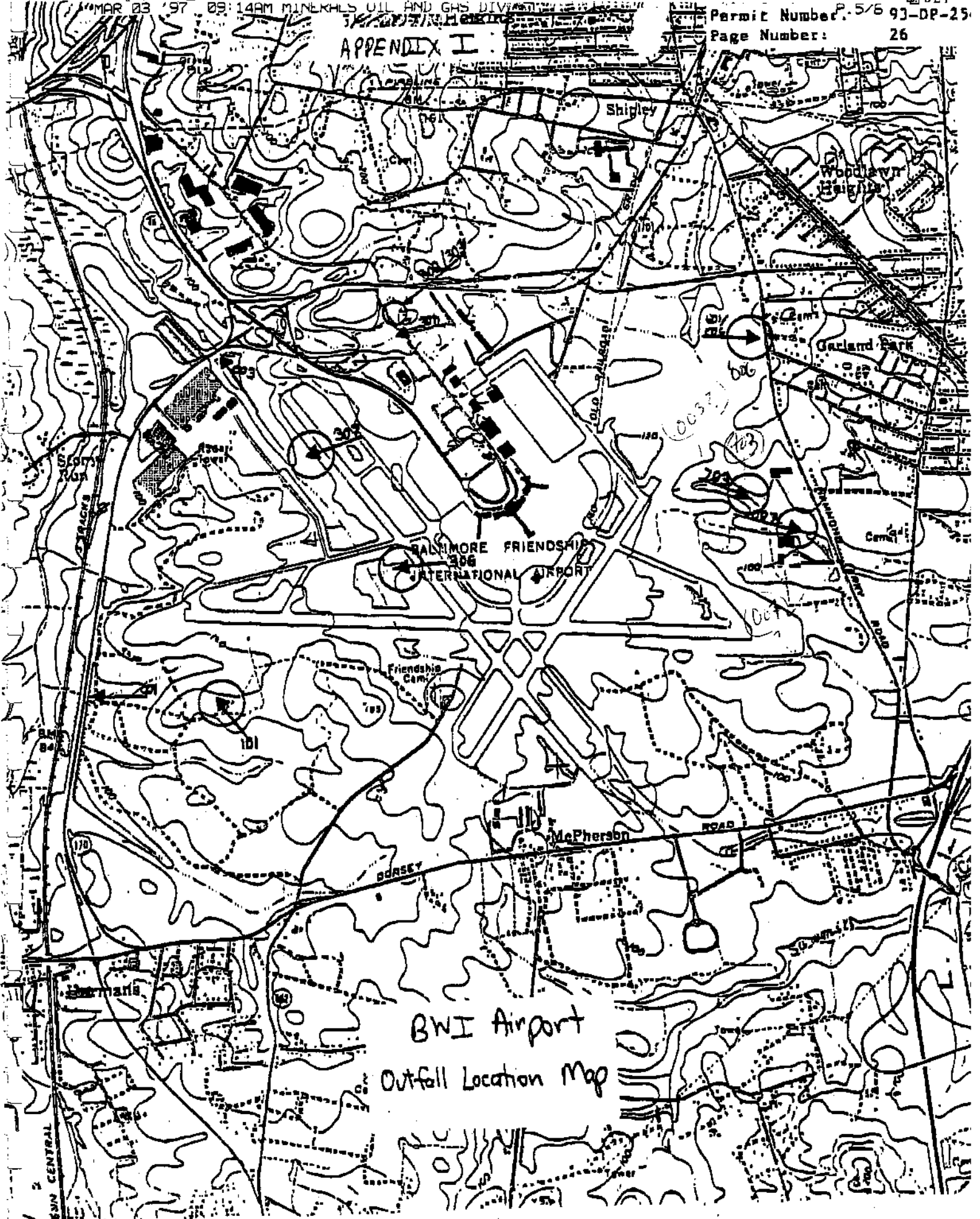
Pursuant to the aforementioned approval, this discharge permit is both a State of Maryland discharge permit and a NPDES permit.

This permit and the authorization to discharge shall expire at midnight on the expiration date. The permittee shall not discharge after that date unless a new application has been submitted to the Department in accordance with the provisions of General Condition II.C.3 of this permit.



J. L. Hearn, Director
Water Management Administration

APPENDIX I



BWI Airport
Outfall Location Map

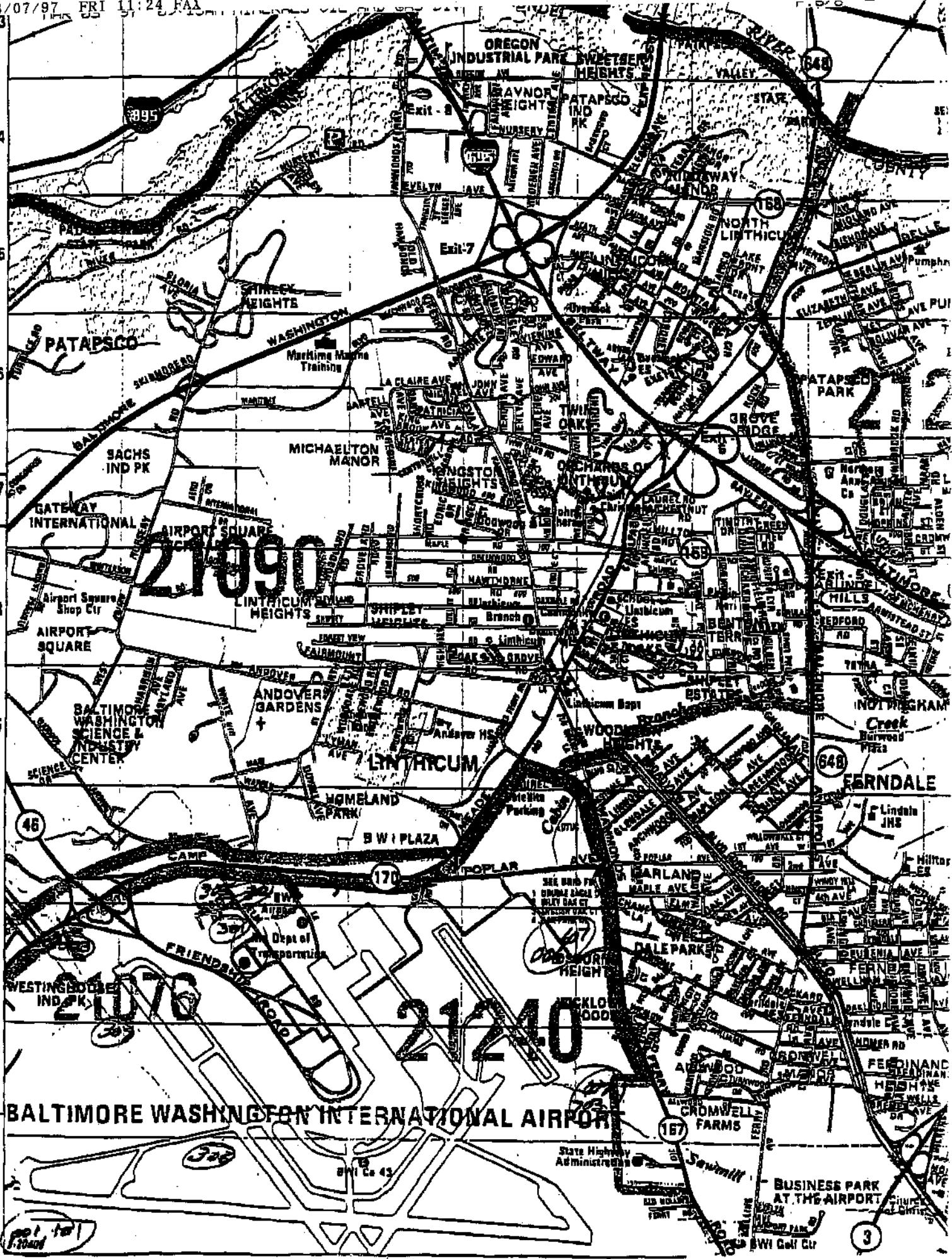
Johns Map 7

100,000 FT

10

11

12



21090

21240

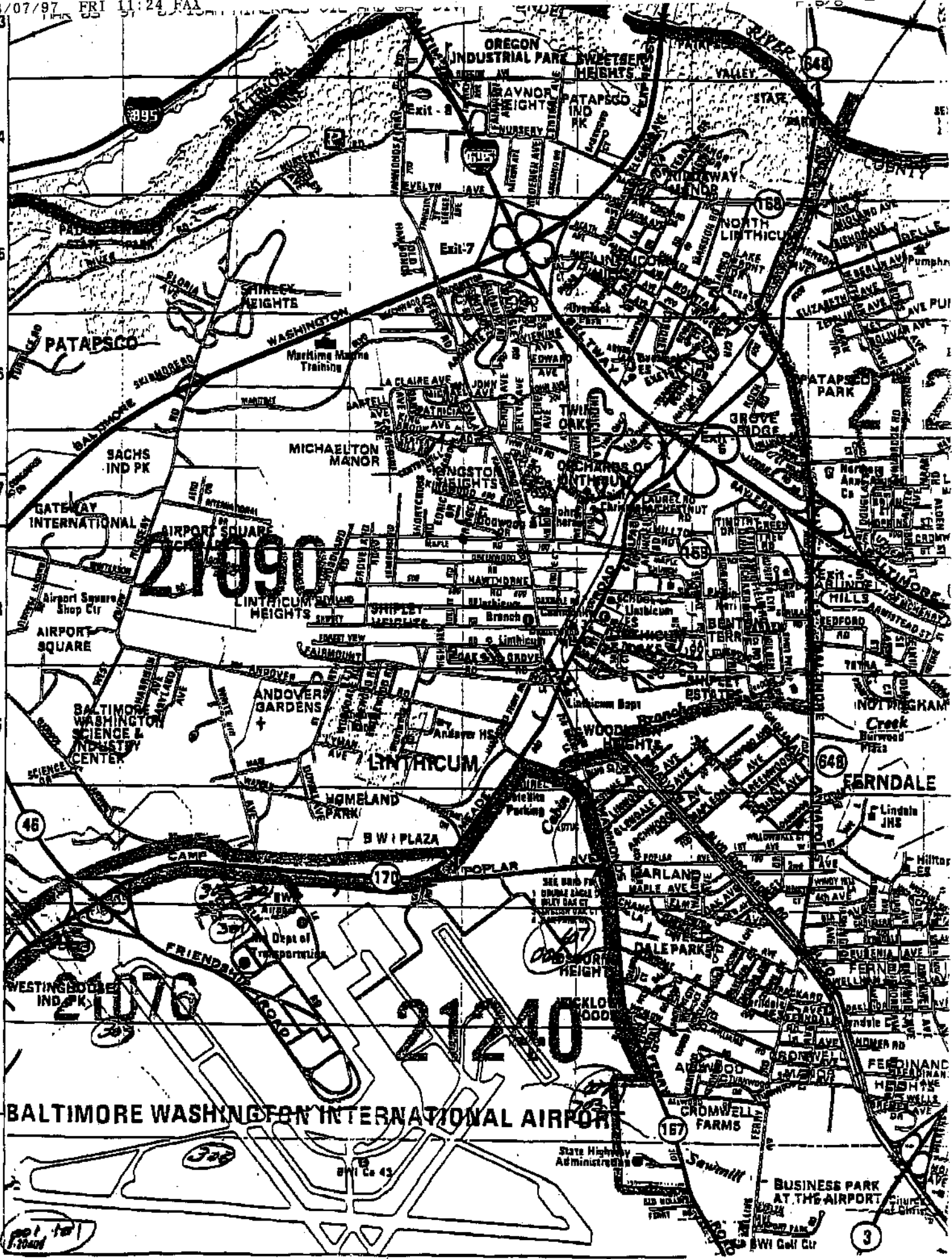
BALTIMORE WASHINGTON INTERNATIONAL AIRPORT

WESTINGHOUSE IND PK

BALTIMORE WASHINGTON SCIENCE & INDUSTRY CENTER

SACHS IND PK

PATAPSCO



101-101
1-20-00

SP1 Co 43

State Highway Administration

BUSINESS PARK AT THE AIRPORT

BWI Golf Clr

3