

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
RIPDES PROGRAM
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908-5767

PUBLIC NOTICE OF PROPOSED PERMIT ACTIONS UNDER THE RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PROGRAM WHICH REGULATES DISCHARGES INTO THE WATERS OF THE STATE UNDER CHAPTER 46-12 OF THE RHODE ISLAND GENERAL LAWS OF 1956, AS AMENDED.

DATE OF NOTICE: Thursday, April 12, 2012

PUBLIC NOTICE NUMBER: PN-12-03

DRAFT RIPDES PERMITS:

RIPDES PERMIT NUMBER: **RI0021598**

NAME AND MAILING ADDRESS OF APPLICANT:

Rhode Island Airport Corporation
2000 Post Road
Warwick, Rhode Island 02886

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

T.F. Green State Airport
2000 Post Road
Warwick, Rhode Island 02886

RECEIVING WATER:

Unnamed Tributaries of Warwick Pond, Buckeye Brook, and Tuscatucket Brook

RECEIVING WATER CLASSIFICATION:

B (Unnamed Tributaries of Warwick Pond and Buckeye Brook) and A (Tuscatucket Brook)

In November 2004, the Rhode Island Department of Environmental Management (RI DEM) reissued a RIPDES Permit to the Rhode Island Airport Corporation for storm water discharges associated with industrial activity at T.F. Green State Airport into the receiving waters listed above. The discharge is from nineteen (19) perimeter outfalls that receive storm water flows from the Airport storm drainage system consisting of storm drains, catch basins, underground piping, and structural storm water controls. The RIAC appealed the permit and on January 18, 2012, RIAC and DEM executed a Consent Agreement to resolve the appeal. The Consent Agreement includes a new draft permit which is the subject of this public notice and stipulates that RIAC and the airline members of the Airport Affairs Committee will not appeal the draft permit provided it is finalized as proposed. The Consent Agreement also requires that RIAC continue to implement interim measures, and design/construct, a deicer management system. Based on computer modeling of historical precipitation data and future flight

patterns, the system is designed to collect approximately 60% of the deicing fluid applied, which achieves or exceeds average collection efficiencies consistent with deicing pads across the country. Deicer runoff collected from the terminal ramp and the cargo areas will be monitored and as required by the permit, and treated at an on-site biological treatment system. The effluent from the treatment system will be discharged to the Warwick Sewer Authority sanitary sewer line on Airport Road.

The DEM has determined that the proposed activities comply with the Policy on the Implementation of the Antidegradation Provisions of the Rhode Island Water Quality Regulations and that existing uses will be maintained and protected. A detailed evaluation of the water quality impact from the proposed activities and any important benefits demonstrations, if required, may be found in the fact sheet which is available as noted below.

FURTHER INFORMATION ABOUT THE DRAFT PERMITS:

A fact sheet (describing the type of facility and significant factual, legal and policy questions considered in these permit actions) may be obtained at no cost by writing or calling DEM as noted below:

Aaron Mello
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908-5767
(401) 222-4700, extension 7405
aaron.mello@dem.ri.gov

The administrative record containing all documents relating to these permit actions is on file and may be inspected, by appointment, at the DEM's Providence office mentioned above between 8:30 a.m. and 4:00 p.m., Monday through Friday, except holidays.

PUBLIC WORKSHOP:

DEM will be holding a Public Workshop to discuss the draft permit and associated Consent Agreement related to the future long term deicing management system. The Workshop will be held at the Warwick City Hall – Council Chambers, 3275 Post Road, Warwick, Rhode Island on April 25, 2012 from 6:00 p.m. to 8:00 p.m.

If you have any questions regarding the workshop, please do not hesitate to contact Aaron Mello at (401) 222-4700 extension 7405. Please note that the workshop is informal and not intended to be a forum for submittal of comments into the official record regarding the draft permit. Only written comments received during the comment period, and oral testimony provided at the hearing regarding the draft RIPDES permit, will be considered part of the record.

PUBLIC COMMENT AND REQUEST FOR PUBLIC HEARING:

Pursuant to Chapter 42-17.4 of the Rhode Island General Laws a public hearing has been scheduled to consider these permits. Notice should be taken that a public hearing will be held at the following time and place:

6:00 PM Monday, May 14, 2012
Room 300
235 Promenade Street
Providence, Rhode Island 02908

In accordance with Rule 43 of the RIPDES Regulations, the following is a summary of the procedures that shall be followed at the Public Hearing:

- a. The Presiding Officer shall have the authority to open and conclude the Hearing and to maintain order; and
- b. Any persons appearing at such a hearing may submit oral or written statements and data concerning the draft permit.

In addition, for the sake of accuracy, it is requested that statements be submitted in writing at the time of the hearing or be mailed to the DEM's Office of Water Resources RIPDES Program, at the above address, before the date of the hearing. Oral testimony will also be heard at the Public Hearing, but will be limited to five (5) minutes in duration.

235 Promenade Street is accessible to the handicapped. Individuals requesting interpreter services for the hearing impaired must notify the DEM at 401-222-4462 (TDD) 48 hours in advance of the hearing date.

PUBLIC COMMENT PERIOD: (APRIL 12, 2012 TO MAY 15, 2012)

Interested parties may submit comments on the permit actions and the administrative record to the address above no later than 4:00 PM Tuesday, May 15, 2012.

Any person, including the permittee/applicant, who believes these permit actions are inappropriate, must raise all reasonably ascertainable issues and submit all reasonably available arguments and factual grounds supporting their position, including all supporting material, by the close of the public comment period under Rule 41. The public comment period is from April 12, 2012 to May 15, 2012. Commenters may request a longer comment period if necessary to provide a reasonable opportunity to comply with these requirements. Comments should be directed to DEM as noted above.

If, during the public comment period, significant new questions are raised concerning the permit, DEM may require a new draft permit or statement of basis or may reopen the public comment period. A public notice will be issued for any of these actions.

FINAL DECISION AND APPEALS:

Following the close of the comment period the Director will issue a final decision and forward a copy of the final decision to the permittee and each person who has submitted written comments or requested notice. Within 30 days following the notice of the final decision, any interested person may submit a request for a formal hearing in accordance with the requirements of Rule 49.

4-9-12

Date



Eric A. Beck, P.E.
Supervising Sanitary Engineer
Office of Water Resources
Department of Environmental Management

Based on requests received before the end of the Public Comment period, (originally scheduled to end 4:00 pm Tuesday, May 15 2012), in accordance with Rule 41 of the RIPDES Regulations RIDEM is extending the Public Comment period for the draft RIPDES permit RI0021598 for TF Green Airport.

The Public Comment period will be extended for two weeks. **The end of the extended Public Comment period will be 4:00 p.m. on Tuesday May 29th 2012.**

Written comments should be signed and submitted to:

Aaron Mello
Rhode Island Department of Environmental Management
Office of Water Resources, RIPDES Program
235 Promenade Street
Providence, RI 02908-5767

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908

FACT SHEET

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PERMIT TO DISCHARGE
TO WATERS OF THE STATE

RIPDES PERMIT NO.

RI0021598

NAME AND ADDRESS OF APPLICANT:

**Rhode Island Airport Corporation
2000 Post Road
Warwick, Rhode Island**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**T .F. Green State Airport
2000 Post Road
Warwick, Rhode Island**

RECEIVING WATER:

Unnamed Tributaries of Warwick Pond and Buckeye Brook, and
Tuscatucket Brook

CLASSIFICATION:

B (Unnamed Tributaries of Warwick Pond and Buckeye Brook), A (Tuscatucket Brook)

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant has applied to the Rhode Island Department of Environmental Management (RI DEM) for reissuance of a RIPDES Permit to obtain permit coverage for storm water discharges associated with industrial activity into the designated receiving water. The facility is engaged in the operations of a major commercial airport serving Rhode Island, southeastern Massachusetts, and Connecticut. The discharge is from nineteen (19) perimeter outfalls that receive storm water flows from the Airport storm drainage system consisting of storm drains, catch basins, underground piping, and structural storm water controls.

II. Limitations and Conditions

The effluent limitations of the permit, the monitoring requirements, and any implementation schedule (if required) may be found in the Permit. Additional implementation schedules are required under Consent Agreement RIA-411.

III. **Description of Facility and Discharge**

This permit authorizes all storm water and allowable non-storm water point source discharges as defined in the Permit to waters of the State from T.F. Green's Storm Sewer System. For the purposes of this permit, storm water includes storm water runoff and snowmelt runoff. There is no limit on the time between the snowfall and snowmelt for the purpose of including a snow melt discharge in the definition of storm water. All other discharges not included in the definition of storm water constitute non-storm water discharges. The conditions in this permit apply to the permittee and all airport tenants engaged in servicing, repairing, or maintaining aircraft and ground support vehicles, equipment cleaning and maintenance (including vehicle and equipment rehabilitation, mechanical repairs, painting, fueling, lubrication) or deicing/anti-icing operations which conduct the above described activities (facilities generally classified as SIC Code 45).

T.F. Green Airport is located in Warwick, RI. Approximate boundaries of the Airport include Airport Road to the north, Lakeshore Drive and various residential streets to the east, Warwick Industrial Drive to the south, and Post Road to the west. The site is approximately 1,093 acres. The Airport is owned by the Rhode Island Department of Transportation and operated by the Rhode Island Airport Corporation. It serves as a major commercial airport in the State and region.

A re-application for an individual permit for the Airport was first submitted on August 18, 1992 and resubmitted on April 7, 1993. The application was updated to include the eleven (11) storm water outfalls at the Airport discharging storm water associated with industrial activity from the thirteen-(13) drainage areas of the Airport. The original permit, issued in April 1987, covered one outfall that primarily conveyed drainage from the apron area. The permit was reissued on November 12, 2004 and subsequently appealed by the Rhode Island Airport Corporation (RIAC). To resolve the appeal of the 2004 permit, DEM and RIAC signed Consent Agreement RIA -411. The Consent Agreement requires RIAC to implement the August 2009 Storm Water Pollution Prevention Plan (SWPPP) as well as design and construct a long term deicer management system to serve the airport's terminal and cargo deicing areas. The Consent Agreement also contains the draft RIPDES Permit that establishes the goals and requirements for a deicer management system for both the terminal area and cargo area of the airport that will include online monitoring and diversion of storm water impacted by aircraft deicing fluid from these areas.

The August 2009 Storm Water Pollution Prevention Plan submitted by RIAC describes how storm water at the airport is managed through a variety of structural controls and management practices that reduce the amount of pollutants discharged from the site. The following storm water management measures are currently implemented at the airport: airport storm water drainage system (storm drains, catch basins, underground piping, and outfalls described above); airfield oil/water separators; Vortechs Storm Water Treatment system serving vehicle parking lots and north cargo ramp; airfield detention basins; airfield vegetation areas; maintenance of airfield pavement and vegetation; AST fuel farm containment dike and water treatment system; glycol blending station; catch basin valve inserts; storage of collected fluids associated with aircraft deicing/anti-icing operations ; glycol mobile collection vehicles; and snow management plans.

RIAC has also developed a plan for a long term deicer management system at the airport's terminal and cargo areas. The system will be designed to prevent the discharge of deicing runoff to surface waters when the concentration immediately downstream of the terminal ramp exceeds 2,950 ppm propylene glycol and when the concentration immediately downstream of the cargo ramp exceeds 1,000 ppm propylene glycol. Based on historical data, the system is designed to collect on average 60% of deicing fluid applied, which achieves or exceeds average collection efficiencies consistent with centralized deicing pads across the country.

Outfalls and Receiving Waters

The airport has thirteen(13) drainage areas encompassing approximately 672 acres tributary to nineteen (19) perimeter outfalls, which discharge storm water associated with industrial activity.

Outfalls 001, 002A, 002A, 003, 004A, 004A, and 013A discharge to tributaries of Warwick Pond; Outfalls 004B, 004C, 005A, 006A, 006B, 006C, 006D, 007A, 007B, 008A, and 009A discharge to tributaries of Buckeye Brook downstream of Warwick Pond, and Outfalls 010A, 011A, and 012A discharge to Tuscatucket Brook. Table 1 below provides information on the drainage areas and the receiving water for each outfall.

Table 1.0

Drainage Area	Size (Acres)	Land Use	Outfall	Receiving Water
1	5.9	Fuel transfer and storage	001A 100A	City storm drain to Buckeye Brook north of Warwick Pond
2	93.4	Aircraft fueling and deicing, cargo operations, tenant hangars	002A	Open swale to Buckeye Brook north of Warwick Pond
3	119.8	Runway, taxiway, glycol transfer and storage	003A	Open swale to Buckeye Brook north of Warwick Pond
4	30.1	Runway, taxiway	004A	Tributary to Warwick Pond
4B	2.0	Airfield	004B	Buckeye Brook south of Warwick Pond
4C	3.0	Airfield	004C	Buckeye Brook south of Warwick Pond
5	3.1	Runway	005A	Buckeye Brook south of Warwick Pond
6	7.6	Runway	006A	Buckeye Brook south of Warwick Pond
6B	1.5	Airfield	006B	Buckeye Brook south of Warwick Pond
6C	0.8	Taxiway	006C	Buckeye Brook south of Warwick Pond
6D	0.7	Taxiway	006D	Buckeye Brook south of Warwick Pond
7	9.6	Taxiway	007A	Buckeye Brook south of Warwick Pond
7B	1.2	Taxiway	007B	Buckeye Brook south of Warwick Pond
8	240.6	Runways, taxiways, aircraft fueling and deicing, vehicle parking	008A	Tributary to Buckeye Brook south of Warwick Pond
9	38.4	Airfield	009A	Buckeye Brook south of Warwick Pond

10	26.0	Airfield, secondary deicing	010A	Grass swale to Tuscatucket Brook
11	14.0	Airfield (Runway, Taxiway)	011A	Grass swale to Tuscatucket Brook
12	46.4	Vehicle parking, Airfield	012A	Grass swale to Tuscatucket Brook
13	28.0	Airfield Maintenance facility	013A	Tributary to Warwick Pond

PERMIT REQUIREMENTS

Storm Water Pollution Prevention Plan

The permit requires the implementation of a Storm Water Pollution Prevention Plan (SWPPP) as of the effective date of the permit.

Certain required elements of the SWPPP are listed below.

- Description of Potential Pollutant Sources
- Storm Water Management Controls
- Deicing Fluid Collection and Management/Source Reduction
- Deicer Management System
- Runway Rubber Removal Procedures
- Odor and Bacteria Growth Response
- Pesticide Management
- Illicit Discharge Detection and Elimination
- Post-Construction Storm Water Management in New Development and Redevelopment
- Drainage Master Plan
- Water Quality Monitoring
- Site Inspection

The permit requires a best management practice (BMP) approach for glycol management. A BMP is defined as any program, technology, process, citing criteria, operating method, measure or devices which controls, removes or reduces pollution. As such, the permit requires that RIAC develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that includes BMPs to promote source reduction and pollution prevention and to be protective of water quality standards and criteria in the receiving waters such as dissolved oxygen and percent saturation, aquatic toxicity, foaming, nuisance odors, and nuisance bacteria growths. RIAC's August 2009 SWPPP substantively satisfies the permit requirements with the exception of the Long Term Deicing Management System. RIAC is obligated to amend the SWPPP as necessary to address permit conditions and shall revise the SWPPP upon implementation of the Long Term deicing Management System.

The permit requires the development of BMPs to minimize the amount of deicing fluids applied to aircraft; minimize contact and dilution of fluid with storm water; prevent releases from accidental spills or leaks; minimize uncontrolled releases of deicing fluid in snow melt; and the use of available technology and controls that collect and dispose of deicing fluid and prevents the dry weather discharge of deicing fluids. .

The permit includes a condition that RIAC prohibit the use of any ADF more toxic than those currently in use as determined by bioassay testing using the results of an LC50 96 h test on *Pimephales promelas* expressed as Propylene Glycol.

The permit does not authorize the use of Urea or Glycols for airfield pavement deicing. It further requires RIAC to implement runway and pavement deicing BMPs that include pollution prevention such as choosing environmentally sensitive products and source reduction BMPs such as anti-icing techniques. The proposed BMPs when implemented will meet the narrative criteria of "no toxics in toxic amounts".

The permit requires that the SWPPP include BMPs, as previously discussed, intended to reduce the potential for the creation of nuisance odors. The permit requires the permittee to develop and implement procedures to identify and respond to occurrences of nuisance odors in the discharges and receiving streams associated with aircraft and airfield pavement deicing. The permit also establishes deadlines for the permittee to respond to notification of odor complaints with outfall and in-stream sampling for propylene glycol and to perform inspections of all associated collections system appurtenances for residual glycols. The permit also contains a condition that will require the permittee to investigate groundwater as a potential source of residual propylene glycol if odors are documented during a dry weather period, dry weather discharges from the outfalls are found to contain detectable concentrations of propylene glycol, or if odors persist after the deicing season has ended.

The permit contains a condition that requires that RIAC observe the receiving waters for nuisance bacteria and should nuisance growths of *Sphaerotilus* continue to occur, that other control mechanisms will be applied as necessary. The permit requires that within seven (7) days of identifying a nuisance odor condition or being notified by RIDEM that a nuisance odor condition has occurred, the permittee shall submit a report that describes the climatic conditions, amount of deicing chemicals used and recovered, a description of the glycol management BMPs implemented, locations of observed odors, measured concentrations of glycol in the discharge and the receiving stream, remedial actions to be taken to mitigate future occurrences and recommend additional controls and amendments to the SWPPP as necessary should nuisance growths continue to occur.

The permit requires RIAC to measure surfactants in the outfalls that serve drainage areas where deicing occurs and requires the implementation of BMPs and a Deicing Management Plan that reduces the potential for foaming caused by the discharge of deicing chemicals.

The Permit requires the implementation of a terminal area and cargo area glycol collection system sized to collect greater than 99% of all flows above the diversion concentrations (2,950 mg/l for the terminal area and 1,000 mg/l for the cargo area) based on simulations of 62 years of historical data. The system will be designed to detect and automatically collect storm water runoff from cargo and terminal areas where deicing occurs and prohibit the discharge of glycol above specified limits. The system is described further under Long Term Deicing Management System, below.

Long Term Deicing Management System

The Deicer Management System will include gate deicing at the passenger terminal covering 29.4 acres and cargo operations deicing over 6.3 acres of ramp area. Three acres have been eliminated from both the gate deicing area at the terminal and the cargo deicing area. Deicer runoff from the terminal area and the cargo area will be monitored and runoff with propylene glycol concentrations greater than or equal to 2,950 ppm and 1,000 ppm, respectively, will be collected. Diversion of glycol impacted storm water will be based on real time monitoring of Total Organic Carbon (TOC) as a surrogate for propylene glycol. Deicer runoff collected from the terminal and cargo areas will be sent to two enclosed storage tanks with odor control systems. From the storage tanks, deicer runoff will be treated at an on-site biological treatment system and effluent from the treatment system will be discharged to the Warwick Sewer Authority sanitary sewer system. Glycol impacted snow will be collected and snow-melt will be diverted to storage at propylene glycol concentrations greater than 2,950 ppm at the terminal and concentrations greater than 1,000 ppm at cargo. The snow

piles will be melted with a snow melter and discharged to the collection system. Major components of the improved Deicer Management System include the following:

- Terminal pump station
- Terminal online monitoring system
- Force main from terminal pump station to storage tanks
- Cargo pump station
- Cargo online monitoring system
- Force main from cargo pump station to storage tanks
- Portable snow melter
- Two above ground storage tanks
- Biological treatment system
- Force main from treatment to sanitary sewer

The performance of the proposed improvements system was simulated using the deicer model (GlyCAST™). The model was used to simulate deicer runoff and management at T.F. Green using sixty-two (62) years of weather from the National Climatic Data Center (NCDC), the forecasted 2020 flight schedule, as presented in the draft Environmental Impact Statement (DEIS) dated July 2010, to size system components and assess performance of the controls.

The model simulated calibrated deicer application volumes, runoff coefficients, properties of deicer applied, snow melt, snow management/melting, anaerobic fluidized bed reactor (AFBR) treatment system, GRV dry weather collection, and glycol blending.

Runoff from the aircraft deicing area at the terminal will be collected by the existing storm water drainage system around the terminal at a point downstream of the existing oil-water separator. Runoff from the aircraft deicing area at the North Cargo Ramp will be collected by the existing storm water drainage system, with some modifications to route non-deicing runoff away from the collection point.

Runoff and snow melt from the terminal with a propylene glycol concentration greater than 2,950 ppm will be pumped to storage tanks via a greater than or equal to 3,900 gallon per minute pump station. Runoff with a propylene glycol concentration greater than 2,950 ppm will be prevented from discharging through the existing storm water system to Outfall 008A. Runoff and snow melt entering the cargo diversion structure with a propylene glycol concentration greater than 1,000 ppm will be pumped to storage tanks at the selected storage and treatment site via a greater than or equal to 1,100 gpm pump station. Runoff entering the cargo pump station with a propylene glycol concentration greater than 1,000 ppm will be prevented from discharging toward Outfall 002A.

Runoff will be monitored, using real-time monitoring of TOC, a surrogate parameter that can be correlated to propylene glycol. Real time monitoring provides the opportunity to more precisely manage deicer runoff. Real time monitoring also allows the deicer management SCADA system to make pre-programmed flow routing decisions based on concentration measurements taken every fifteen (15) minutes, eliminating the time delay associated with manual sampling and analysis. TOC analyzers can measure to a much finer resolution than refractometers and TOC concentrations can be correlated to propylene glycol concentrations at a given site. The correlation between TOC measurements from the online meter and the laboratory based propylene glycol measurements will be established after the unit has been installed, but before it is used for diversion of storm water.

Deicer runoff enters storage from the terminal pump station and the cargo pump station and discharges to an anaerobic fluidized bed reactor (AFBR) treatment system. The GlyCAST™ modeling considered 62 seasons of historical winter weather conditions and results were produced to design the capacity of the pumps and the maximum storage required for each season. From those 62 simulated seasons, the pumps shall be sized to collect greater than ninety-nine (99) percent of all flows above the diversion concentration and the maximum storage volume was selected. The results show that the maximum design storage volume out of the 62 seasons is 5.8 million gallons however the tanks and the capacity of the AFBR will be sized appropriately to collect and treat all flows that the pumps send. An AFBR treatment system utilizes microorganism to anaerobically degrade organic components of deicer runoff including glycols. The treatment

system will produce treated effluent with minimal concentrations of propylene glycol, some biological solids, and methane gas which can be reused to help reduce energy consumption of the treatment facility. The GlyCAST™ model was utilized to determine an appropriate capacity for the AFBR treatment system. The system was chosen because it performed the best overall in light, medium, and heavy deicing seasons. The modeling showed that during typical deicing seasons, AFBR system would operate from December through July. During the heaviest deicing seasons, system may operate from November through October.

Warwick Sewer Authority (WSA) Negotiations

RIAC has coordinated with the WSA regarding conditions for accepting the discharge of pre-treated effluent from the proposed on-site treatment system. Discharge of untreated deicer runoff was not acceptable to WSA because the loading could account for 30% of the total wastewater treatment facility capacity and because of the highly unpredictable and variable nature of the flow and BOD load associated with deicer runoff. WSA agreed to accept deicer runoff after pre-treatment. Anaerobic fluidized bed reactor (AFBR) technology is planned for pre-treatment of deicer discharges. A combination of deicer modeling and research from existing airport AFBR treatment systems was used to determine the anticipated characteristics of the pre-treated effluent.

Dry Weather, Low Activity Wet Weather and Secondary Deicing

The permit requires the operation of mobile collection units and glycol recovery vehicles during 1) dry weather and 2) wet weather deicing events when activity within the terminal and cargo area is conducive to GRV use collection (i.e. "low activity wet weather") in the terminal, cargo, and at secondary deicing locations.

During dry weather deicing events, catch basin inserts will be utilized in the terminal and cargo collection systems and glycol collection equipment (ie; GRV, MCUs) will collect spent deicing fluid and transfer it to on-site storage tanks for on-site treatment.

During low activity wet weather deicing events catch basin inserts will be utilized in the terminal and cargo collection systems and glycol collection vehicles will collect the retained deicing runoff and transfer it to on-site storage tanks for on-site treatment.

Under limited circumstances (e.g. extreme weather) deicing may be required at secondary deicing locations during wet weather deicing events. Catch basin inserts will be utilized at secondary deicing locations and glycol collection vehicles will collect the retained deicing runoff and transfer it to on-site storage tanks for on-site treatment.

Internal Outfall Monitoring/Reporting/Calibration

In order to measure the effectiveness of the diversion systems RIAC shall provide flow monitoring at a location downstream of the diversion points for the terminal area (Outfall 200A) and cargo area (Outfall 300A). All flows that bypass the collection and treatment system are discharged to waters of the State (i.e. not diverted to storage, treatment, and discharge to the sanitary sewer system) will be limited and monitored by the permittee. Flow monitoring will occur downstream of the diversion point prior to mixing with other flows and represents flow that is discharging toward the outfall. A Bypass Event is defined as a discharge that begins after the approved Response Period and the calculated propylene glycol concentration exceeds 2,950 mg/l at the terminal or 1,000 mg/l at the cargo area and ends when the calculated propylene glycol is less than 2,950 mg/l at the terminal area or 1,000 mg/l at the cargo area or flow ceases. The average flow bypassing treatment, the average calculated propylene glycol concentration and Bypass Volume shall be recorded for each Bypass Event. The approved Response Period represents the period between measurement of a calculated propylene glycol concentration greater than 2,950 mg/l at the terminal area and 1,000 mg/l at the cargo area and cessation of flow toward the outfall due to pump start-up, dewatering of the pump wet well and dewatering of the outfall line at the point of flow measurement. The response period shall be established as ten minutes, and shall be subject to modification based on assessment during the start-up and commissioning of the system as described in Part I.B.4.a.(2). The permittee shall maintain a flow log with the monitoring results for any time period where the calculated propylene glycol concentration exceeds the diversion limit of 2,950 mg/l at

the terminal area or 1,000 mg/l at the cargo area, which includes the duration of the bypass flow, the time(s) of day when the bypass flow commences and ceases, the calculated propylene glycol concentration and the bypass volume and shall provide a report to RI DEM.

RIAC shall develop procedures for calibration and assessment of the on-line TOC sample collection and analysis system associated with the cargo and terminal area deicer fluid collection systems and for determination of the corresponding propylene glycol concentrations. These procedures shall include collection of discrete samples (from both the cargo and terminal area systems) during a deicing event, when flow exists at the downstream sampling location for analysis of TOC and propylene glycol.

IV. Permit Basis and Explanation of Effluent Limitation Derivation

General Statutory/Regulatory Requirements

In 1972, the Federal Water Pollution Control Act, also referred to as the Clean Water Act (CWA), was amended to provide that the discharge of pollutants to waters of the United States from any point source is effectively prohibited unless discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. Amendments to the CWA in 1987 added Section 402(p) to the Act, which establishes a framework for regulating discharges of storm water associated with industrial activities of under the NPDES program. In 1990, EPA issued final regulations that established application requirements for storm water permits, commonly referred to as Phase I Storm Water Rules. These rules required owners or operators of specific categories of industrial facilities, which discharge storm water directly to the waters of the United States or indirectly through a separate storm sewer system via a point source conveyance, to apply for a NPDES storm water permit. As defined in the Code of Federal Regulations (40 CFR 122.2), a point source means "any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel, or other floating craft, from which pollutants are or may be discharged...". Industrial activities at a transportation facility are defined by a federal regulations as those consisting of "portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified in the regulations."

EPA has delegated to the State of Rhode Island the authority to issue permits under the Rhode Island Pollutant Discharge Elimination System (RIPDES) Program, which includes discharges of industrial storm water. In 1993 RI DEM amended the RIPDES Regulations to include the Phase I Storm Water Rules. Rule 31(c) requires that facilities with point source discharges of storm water associated with industrial activity apply for coverage under an individual, EPA group or a general permit. Rule 31(f) established an application deadline of April 19, 1993.

The requirements set forth in this permit are from the State's Water Quality Regulations and the State's Regulations for the Rhode Island Pollutant Discharge Elimination System, both filed pursuant to RIGL Chapter 46-12, as amended. DEM's primary authority over the permit comes from EPA's delegation of the program in September 1984 under the Federal Clean Water Act.

The effluent monitoring requirements have been specified in accordance with RIPDES regulations as well as 40 CFR 122.41 (j), 122.44 (i), and 122.48 to yield data representative of the discharge.

Effluent Limitations and Monitoring Requirements

This Permit establishes monitoring requirements for the nineteen (19) perimeter outfalls listed above in the Outfalls and Receiving Waters section of the Fact Sheet.

The 2005 Permit required outfalls to be monitored as indicated in Appendix J of the August 2009 SWPPP. Based on review of outfall monitoring data for all outfalls from 4th Quarter 2005 through 3rd Quarter 2011 it was determined that the following monitoring parameters could be eliminated: Total BTEX, MTBE, TPH, PAHs, and the following total metals (Antimony, Arsenic, Barium, Boron,

Calcium, Magnesium, Manganese, Selenium, Sodium, Thallium, and Tin). A Summary of the data is available in an electronic spreadsheet. Parameters were only deleted if over the 5 year period there was 1) no detection at any outfall above the detection limit and if there is a water quality criteria for the pollutant, the detection limit was less than the criteria (e.g. Benzene, Toluene, Ethylbenzene, o-xylene, m,p-Xylene, MTBE; 2) one or two low-level detections for pollutants that do not have water quality criteria (e.g. PAH's); 3) detected levels where the maximum value and average value were below the Acute and Chronic Water Quality Criteria respectively (e.g. Antimony, Arsenic, Selenium, Thallium); 4) pollutants that were detected that have no water quality criteria, pollutant not an indicator or a pollutant of concern (Boron, Barium, Calcium, Manganese, Magnesium) 5) pollutants not detected, no criteria (e.g. Tin) .

Outfalls Discharging Storm Water Associated with the Aircraft Deicing and Anti-icing

The permit contains effluent discharge limitations¹, consisting of narrative/numeric effluent discharge limits based on Technology-based effluent limitations and Water quality-based effluent limitations as well as Special conditions—supplemental controls and Best Management Practices (“BMPs”)² that may be needed in order to ensure that the goals of the CWA are met.

As part of developing the framework for effluent limits for the discharge of pollutants RIDEM completed a thorough review of ADF application and recovery operations at T. F. Green and also assessed current reported operations in use and planned at other similarly situated airports for reducing/eliminating contamination to storm water. RIDEM also established monitoring and reporting requirements, standard legal and administrative requirements, and BMPs, which are needed to ensure that ADF operations at T. F. Green satisfy the goals of the CWA .

Incorporating results from the Reviews and utilizing its best professional judgment, (BPJ)³ RIDEM established a framework for effluent discharge limits based on the best available technology economically achievable (BAT).⁴ The purpose was to determine what constitutes demonstrated and reasonable performance to limit the addition of ADF pollutants to storm water that discharges to waters of the state, which RIDEM believes is economically feasible for RIAC as an Air Transportation-facility. CWA Section 402(a)(1); 33 USCA §1342(a)(1); 40 CFR §125.3(c)(2) and (d);

As permitted by 40 CFR 122.44(k)(2), RIDEM imposed BMPs permit conditions and numeric effluent limitations. . The BMPs are flexible requirements that allow RIAC to design site-specific plans to minimize and control pollutants in storm water discharges associated with their ADF to be used as a substitute for measures designed to reduce contamination to storm water before discharge from a point source occurs. 40 CFR 111.45(f)(1) In addition, RIAC's BMPs must use “source control technologies which are the BAT or equivalent of best conventional pollutant control technology (“BCT”).

¹ Section 502 of the CWA defines “effluent limitations” as “any restriction established by a State or the Administrator on quantities, rates, and concentrations of...other constituents which are discharged from point sources.” Therefore, effluent limitations can include narrative conditions and best management practices.

² RIPDES Rule 3 defines BMPs as meaning “schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.”

³ NRDC v. EPA, 859 F.2d 156, 199 (D.C. Cir. 1988) (“BPJ limits constitute case-specific determinations of the appropriate technology-based limitations for a particular point source”).

⁴ The imposition of BAT limits serves the goal of eliminating discharge of pollutants. In addition, permit writers are afforded “considerable discretion in evaluating the relevant factors and determining the weight to be accorded to each in reaching its ultimate BAT determination.” Texas Oil & Gas Ass'n, 161 F.3d 923,929 (5th Cir. 1998), citing NRDC v. EPA, 863 F.2d at 1426. See also Weyerhaeuser v. Costle, 590 F.2d1011, 1045 (D.C. Cir. 1978) (discussing EPA's discretion in assessing BAT factors, court noted that “[s]o long as EPA pays some attention to the congressionally specified factors, the section [304(b)(2)] on its face lets EPA relate the various factors as it deems necessary).

The permit limits are consistent with 40 CFR 122.44(k)(2) and in accordance with the BMP approach as outlined in EPA's August 1, 1996 memorandum entitled "Interim Permitting Approach for Water Quality-Based Effluent Limitations for Storm water Discharges" in Storm Water Permits; and as allowed in RIPDES Rule 15.01 (which provides for the adoption of BMPs reasonably necessary to achieve effluent limitations for purposes of controlling and abating discharges of ADF pollutants as authorized under Section 402(p) of the CWA to control storm water discharges).

Outfalls Discharging Storm Water associated with Fueling and Fuel Storage

Portions of discharges from perimeter outfalls designated 001A, 002A, and 008A receive treatment from oil/water separators due to the nature of activities taking place in the corresponding drainage/sub-drainage basins (i.e., fueling, fuel storage) and the potential for petroleum products to be present in the respective discharges. These outfalls will be sampled to evaluate the effectiveness of the best management practices and oil/water separators. The effluent limitations for oil and grease are based on American Petroleum Institute (API) oil/ water separator guidelines.

Outfall 100A is located within Drainage Area 13 of the airport property, which contains the airport's primary fuel farm. The fuel farm consists of aboveground storage tanks (AST) and fueling facility. The fuel farm is designed and operated to fully comply with all SPCC requirements per 40 CFR 112. The AST fuel farm includes six (6) 50,000-gallon Jet A tanks, one 12,000-gallon AVGAS tank, one 12,000-gallon gasoline tank, and one 6,000-gallon diesel tank. The AST's and aboveground piping have appropriate secondary containment. Storm water that collects in the diked areas drains to a valve sump at the eastern end of the containment dike. The water is tested prior to being discharged through a water treatment system. The treatment system consists of an activated carbon filter and pump station equipped with a flow-activated pump. The treated storm water discharges through an Oil/Water Separator via Outfall 001A to an existing municipal storm water drainage system along Airport Road and discharges into Buckeye Brook north of Warwick Pond.

The effluent discharge limitations for Outfall 100A are consistent with those for Class B receiving waters with a dilution factor greater than ten (10), as shown in Part I.B.4. of the RIPDES General Permit for Discharges Associated with the Treatment of Groundwater Contaminated by #2 Fuel Oil (General Permit). The effluent limitations contained in the General Permit consist of either water quality based limits, technology based limits, or a combination of each. The more stringent of the two allowable discharge levels were used as the actual effluent limitation for a given pollutant. For the parameters that require monitoring, only pH, Benzene, Total BTEX, and Total Petroleum Hydrocarbons (TPH) contain numeric effluent limitations. The average monthly discharge limits for Benzene were established based on removal efficiencies achieved by conventional treatment technology commonly used in groundwater remediation projects (i.e. air stripping, GAC), consistent with the EPA guidance document entitled 'Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks' (EPA Model Permit), published June 1989. The maximum daily discharge limits for Benzene were based on technology based limits, which were more stringent than freshwater aquatic life criteria (acute exposure). Total BTEX limits were technology based following guidance in the EPA Model Permit. The TPH limit was based on the removal efficiencies achieved by conventional treatment technology commonly used in groundwater remediation projects (i.e. air stripping, GAC). Granular activated carbon technology is proven to be able to remove VOCs and SVOCs to a concentration below 1.0 ug/L.

The effluent limitations for pH are based on criteria established in the State's Water Quality Regulations.

The remaining general conditions of the permit are based on the RIPDES regulations as well as 40 CFR Parts 122 through 125 and are common to all permits. The remaining specific conditions of the permit are based on the RIPDES Regulations as well as 40 CFR Parts 122 through 125 and consist primarily of management requirements.

The RI DEM has determined that all permit limitations are consistent with the Rhode Island Anti-degradation policy.

Receiving Water Classifications/Impairments and Approved TMDLs

The State of Rhode Island 2010 303(d) List of Impaired Waters (July 2011) was developed by the RI DEM in response to requirements of Section 303(d) of the federal Clean Water Act (CWA). The 2010 303(d) list identifies waterbodies within the State, which may not currently meet Rhode Island Water Quality Standards. This list has been compiled by DEM's Office of Water Resources (OWR) and is based upon the recently completed comprehensive assessment of water quality conditions. The 303(d) list identifies impaired waterbodies and a scheduled time frame for development of total maximum daily loads (TMDLs). As such, the 303(d) list is used to help prioritize the State's water quality monitoring and restoration planning activities. The goal of DEM's TMDL program is to develop and implement plans aimed at restoring impaired waterbodies to an acceptable condition that meets water quality standards and support their designated uses (e.g., fishable and swimmable). The 2010 303(d) list uses five assessment categories for each surface water body that are based on the state's Consolidated Assessment and Listing Methodology.

Name	Class ¹	303(d) Category ^{2,3}	303(d) listed impairment ⁴	Approved TMDL
Warwick Pond	B	4A		total phosphorus and dissolved oxygen 9/27/2007
Tributaries to Warwick Pond	B	4A		fecal coliform and enterococcus 12/23/2008
Buckeye Brook and tributaries	B	5	benthic macroinvertebrate bioassessment and enterococcus, and fecal coliform	
Tuscatucket Brook	A	4A		fecal coliform 12/16/2006

¹Appendix A of the Rhode Island Water Quality Regulations (latest revision).

² A Category 4A waterbody if impaired or threatened for one or more designated uses but does not require development of a TMDL because a TMDL has been completed (and when implemented are expected to result in attainment of the water quality standard).

³ A Category 5 waterbody is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL (this is the 303(d) Impaired Waters List).

⁴The State of Rhode Island 2010 303(d) List of Impaired Waters (July 2011)

Water quality monitoring to date does not indicate discharges from T. F. Green are significant sources of Phosphorus, Fecal Coliform bacteria, or Enterococcus.

Environmental impacts associated with Deicing/anti-icing:

Propylene glycol is the primary ingredient in aircraft deicing and anti-icing fluids applied at T. F. Green.. The potential impacts of the discharge aircraft deicing fluids to surface waters include: reduction in dissolved oxygen (DO) levels, aquatic life toxicity, offensive odors and the growth of nuisance bacteria. Aircraft and pavement deicing/anti-icing operations are performed at T. F. Green Airport from October through April. Propylene glycol-based products are used at T.F. Green for aircraft deicing/anti-icing, while sodium formate and potassium acetate are applied as

deicing agents for airfield pavement. Sodium formate has replaced solid urea, while potassium acetate has replaced liquid glycol pavement anti-icing/deicing products at the airport. The use of ethylene glycol as an anti-icing or deicing agent has been discontinued at the airport since 1992.

Dissolved Oxygen

The RI Water Quality Regulations set a Dissolved Oxygen (DO) criteria for the receiving waters of not less than sixty (60) percent saturation, based on daily average, and an instantaneous minimum concentration of at least 5.0 mg/l and a seven (7) day mean water column DO of not less than 6.0 mg/l. The RIDEM Division of Fish and Wildlife has classified Warwick Pond, Buckeye Brook, and Tuscatucket Brook as Warm Water Fish Habitat.

Propylene glycol readily degrades in the aquatic environment under certain temperature conditions and exhibits a high BOD₅. Typically, the majority of significant deicing/anti-icing operations at TF Green occur from December through March during the period of time when stream temperatures are coldest. Deicing/anti-icing operations may occur as early as October and as late as April. Although low DO levels are less likely to occur during the coldest period of the deicing season, as the season ends and temperatures rise, limited aircraft deicing may still occur. In addition, snow piles which may contain spent deicing agents melt as temperatures rise and drain to the site drainage system, as well as to the receiving waters.

In accordance with the 2004 permit RIAC has been monitoring in-stream dissolved oxygen during deicing events. Data at the outlet of Warwick Pond and data from monitoring location BB-07 (downstream from Outfall 008) indicate no exceedances of dissolved oxygen criteria. In addition, RIDEM has compiled in-stream dissolved oxygen data collected to support the development of the TMDLs for Warwick Pond and Buckeye Brook. Dissolved Oxygen was measured at locations downstream of RIACs significant outfalls where deicing occurs in 2006, 2008, and 2011. Monitoring events in 2006 and 2008 indicated no exceedances of the DO criteria at Stations BB-02 and BB-03 (the inlet and outlet of Warwick Pond), and exceedances of criteria at Station BB-04 (downstream of Outfall 008 and BB05/5A). The monitoring data from an event in 2011 indicates that there were no exceedances of DO criteria at Station BB-02, BB-03, BB-04 and BB05/5A.

Monitoring by DEM on February 1, 3, 6, and 8, 2011, was performed during a winter storm in which aircraft deicing fluid was applied at T. F. Green. RIAC's 1st Quarter Wet Weather Specific Deicing Fluid Collection and Management Report dated April 15, 2011, indicates that RIAC outfall and in-stream sampling began February 1st.

Both DEM in-stream monitoring and RIAC in-stream monitoring performed during the February 2011 event indicate there were no exceedances of DO criteria. From 1999 – 2001 when RIDEM first evaluated the impacts to dissolved oxygen, RIACs annual collection efficiency ranged from 16 – 28 percent annual collection efficiency. Over the past ten years RIAC has implemented best management practices and improved collection efficiencies. RIAC's 2010-2011 End-of-Season Deicing Management Report indicates that RIAC achieved a forty-four (44) percent annual collection efficiency. During the February 2011 monitoring event, from February 1 through February 8th, RIAC obtained an average collection efficiency of fifty (50) percent. Implementation of the requirements of the draft permit is expected to increase the average annual collection efficiencies to approximately sixty (60) percent. Based on the historical monitoring, DEM has determined that the proposed level of control will prevent violations of in-stream DO criteria.

Biological Impairments

Buckeye Brook Biodiversity and Aquatic Toxicity Studies

The state's 2006 303(d) list (i.e. impaired waters list) identifies Buckeye Brook as having biodiversity impairment. RIDEM is required to develop a restoration plan or TMDL for all impaired waters. In preparation for developing a restoration plan, Rhode Island Department of Environmental Management conducted a sampling project to further characterize the geographic extent and

severity of the biodiversity impairment and to identify potential causes and/or pollution sources contributing to the impairment. Four surveys (two dry and two wet weather surveys) were conducted on the Buckeye Brook Watershed. Water quality testing was completed during all four surveys, during one survey biodiversity impacts were measured based on the numbers and types of benthic macro invertebrates and periphyton present (September 10, 2008) and aquatic toxicity analysis (based on laboratory toxicity testing) was conducted during one dry weather survey (July 16, 2008) and again one during a wet weather event when deicing fluids were applied (February 3, 2011).

Biodiversity Sampling

ESS Group, Inc under contract to DEM performed biodiversity impact analyses based on benthic macro invertebrates and periphyton assessments and produced the report entitled: Buckeye Brook Biodiversity Impairment Data Report, 2008 Buckeye Brook, Warwick, Rhode Island, April 2009 ("the ESS Report"). The ESS Report states:

"Macroinvertebrates are widely accepted as indicators of water quality conditions because their life cycles are spent largely or entirely in the water and therefore they are exposed to non-point and point source pollutants in surface waters over extended periods of time (months to years). The periphyton community also serves as an indicator of water quality but the life cycles of most periphyton species are relatively short and therefore the periphyton community generally tracks shorter duration stress measured on the order of weeks rather than months or years. Both macroinvertebrates and periphyton are useful in biological monitoring because of the wide range of tolerances among taxa to various physical, chemical, and even biological stressors."

Macro Invertebrate Results

Key findings of the ESS Report are that macroinvertebrate data:

- 1) Suggests moderate to severe biological impairment across most, if not all, of the watershed.
- 2) Stations on and just downstream of the tributaries sourced by T.F. Green Airport and the Truk-Away Landfill (BB02, AP01, and BB04) appear to be more severely impaired (sensitive taxa are found in very low abundances, if at all).
- 3) WR01A on Warner Brook also shows signs of severe impairment and it is isolated from the effects of both the airport and landfill. Low dissolved oxygen concentrations (near 5 mg/L), high specific conductance (472.7 μ S/cm), high nitrate/nitrite-N (1.83), and high total organic carbon (6,900 mg/kg) were found by RIDEM at this station during sampling on September 10, 2008, suggesting that there may be additional sources beyond urban non-point source pollution impacting Warner Brook.
- 4) Fairly poor stream habitat may also play a role in the biological impairments noted on Buckeye Brook and its tributaries. Two of the stations with consistently poor biological metric scores (AP01 and WR01A) also received habitat scores suggesting only partial support for instream biology. Additionally, smothering of habitat by iron flocculent material was noted within each of the tributaries originating from the airport and/or landfill, including OF08, AP01, and TA01. Although flocculent material was less visible downstream at BB04, analysis of the macroinvertebrate samples confirmed its presence at this station, as well. In addition to the implication that landfill leachate (and associated contaminants) is entering these tributaries, the flocculent material itself may directly reduce habitat quality and contribute to observed biological impairment.

Periphyton Results

Regarding the periphyton data, the ESS Report states:

"In the absence of a true reference site for periphyton, it is difficult to quantify the level of biological impairment over the Buckeye Brook watershed as a whole. However, there is some indication that certain periphyton metrics, such as taxa richness, may be somewhat less than expected for small streams in the ecoregion. Additionally, the relatively high contribution of taxa that tend to be associated with some form of instream disturbance (e.g., siltation, nutrient enrichment, flashiness) may be reflective of an overall depression in biological and habitat condition throughout the Buckeye Brook watershed. Habitat observations by ESS and nutrient data collected by RIDEM would appear to support this connection.

However, the trends in the periphyton community do not, at this point, clearly implicate a particular stressor or source in Buckeye Brook or its tributaries. This may be due, in part, to the fact that the periphyton community is generally responsive to shorter term impacts than the macroinvertebrate community. Although deicer may impact stream water throughout the year through surface and ground water inputs, toxicity is likely to be highest in the winter when application of deicers is greatest (Corsi et al., 2001). This seasonality may reduce the ability to detect impacts from this potential stressor on the periphyton community during the low flow period. Additionally, the unusually wet "low flow" period in 2009 may have resulted both in more scour and dilution of pollutants than is typical in the late summer. Storm event water quality data collected by RIDEM in December 2008 appear to confirm this dilution effect for many of the heavy metals monitored at a location (TA01) downstream from the landfill. Furthermore, although only one periphyton plate sampler was lost, it is possible that repeated spates resulted in large amounts of scour, especially at the headwater or tributary sites more prone to flashiness (e.g., BB00 and AP01). Patterns in the concentration of CPOM and FPOM did not display any significant trend in the downstream direction. However, when the two size fractions are combined, a trend of steady increase is apparent in the downstream direction. Nonetheless, it is difficult to infer an association with the observed biological patterns from a single measurement of POM. Adjustment of sampling frequency to include additional samples, especially over a full event hydrograph, may be useful for future efforts." (the Corsi et al., 2001 study did not include specific monitoring at T. F. Green and the quote is related to possible impacts).

Overall Conclusions of Biodiversity Sampling

The results of the biodiversity studies are summarized in the ESS Report as:

"In sum, the Buckeye Brook watershed appears to be highly stressed throughout. However, biological impairment was most readily detected in the macroinvertebrate community at BB02, AP01, and BB04, each of which is located on or just downstream of {T. F. Green Airport}. AP01 and BB04 show signs of the most severe impairment, suggesting that the influence of outfall flows from T.F. Green Airport may be exacerbated by leachate from the Truk-Away Landfill. The results of this assessment suggest that the biological impairment of Buckeye Brook may need to be addressed at known sources of contamination or disturbance (e.g., the airport and landfill), which appear to worsen existing background levels of impairment. Some degree of improvement may be achieved by addressing leachate issues at the Truk-Away Landfill and through implementation of new aircraft/airfield source water contamination prevention measures (USEPA, 2002) at the T.F. Green Airport. However, addressing stressors on a watershed-wide basis may be necessary to further improve Buckeye Brook's biological condition beyond that of "moderately impaired."

Aquatic Toxicity

The RI Water Quality Regulations do not establish a numeric Ambient Water Quality Criteria for propylene glycol for the protection of aquatic organisms from acute and chronic effects. However, the Regulations do have a narrative criteria of "none in such concentrations that could be harmful to humans or fish and wildlife for the most sensitive and governing water class use, or unfavorably alter the biota, or which would make the waters unsafe or unsuitable for fish and wildlife or their propagation, impair the palatability of same, or impair waters for any other existing or designated use".

Receiving water samples for aquatic toxicity testing were collected on July 16, 2008 and February 3, 2011. Survival and growth tests were conducted on Fathead Minnows (*Pimephales promelas*), and survival and reproduction tests were conducted using water fleas (*Ceriodaphnia dubia*)

Results for Samples collected July 16, 2008

Fathead Minnow

Neither the survivability nor the growth test (i.e. biomass) showed any statistically significant impact.

Ceriodaphnia dubia

No statically significant effect on survival was observed for any sample stations.

The reproduction test showed a significant reduction in the number of offspring produced at stations downstream from Truk-Away landfill (TA01) and from the Airport Outfall OF08.

Results for Samples Collected February 3, 2011

Fathead Minnow

No statically significant effect on survival except for station BBO2. There is a distinct possibility that the filamentous floc that developed in test sample reduced survival due to a physical impairment rather than a true chemical effect.

Statistically significant reduction in biomass was observed at BB02, BB04, OF08 and TA01, it is clear that BB00 and BB03 show no signs of impairment. Results for the other stations are difficult to interpret due to the difficulties maintaining DO levels. Filamentous floc may likely contributed to the reduction in growth and DO may be more of a contributing factor to other test findings.

Ceriodaphnia dubia

No statically significant effect on survival was observed for any sample stations.

The reproduction test on the laboratory control organisms failed to meet the test acceptability criteria. Although the laboratory control test organisms failed to meet acceptability criteria, the report notes that it can be stated with some confidence that if test organism health was improved and test was repeated it would indicate no significant difference in reproduction for any of the samples.

According to the EPA's *Preliminary Data Summary Report* for developing National Effluent Guidelines, the toxicity exhibited by aircraft deicing/anti-icing fluids (ADFs) is due in part to the presence of glycols (which typically make up approximately 45% to 65% of the total fluid by weight when applied), but is also due to the additives contained in the fluids. ADFs typically consist of ethylene/propylene glycol, water, surfactants (wetting agents), corrosion inhibitors (including flame retardants), pH buffers, dyes, 1,4-dioxane, and complex polymers. Propylene glycol based deicing fluids are generally less toxic to aquatic species than ethylene glycol based products. The chemical additives contribute significantly to the overall toxicity of ADFs and test results indicate that the formulated fluids are more toxic than pure glycol substances. Deicing fluids additives comprise approximately 1% or less of Type I fluids and 2% or less of Type II/IV fluids. Type I and Type IV propylene glycol formulated fluids are used at T. F. Green by tenants for their aircraft deicing/anti-icing operations respectively. During most deicing events, typically greater than 90% of the total amount of deicer used is Type I. Type I fluids as applied on aircraft contain between 30 and 60% Propylene Glycol (typically ~45%), whereas Type IV fluids are not diluted and contain 50-52% Propylene Glycol.

The Fact Sheet for the 2004 Permit explains how the 2004 permit established the narrative condition that prohibits the use of any ADF products that display toxicity greater than a specific threshold. RIDEM compiled bioassay results performed by the manufacturer and supplied by RIAC for the formulated Type I deicers in use at TF Green at the time. The results in the table below were used to select a threshold and establish a permit condition that the toxicity of the ADF products shall not be greater than 3,300 mg/l as determined by a 96-h LC₅₀ bioassay test on *Pimephales promelas* (Fathead minnow) expressed as Propylene Glycol.

Species	Duration and Endpoint	Lyondell Product	Octagon Product
Daphnia Magna	48-h LC50	5,280 mg/l	19,184 mg/l
Fathead Minnow	96-h LC50	3,344 mg/l	6,160 mg/l

This Permit includes a condition that RIAC prohibit the use of any ADF more toxic than those currently in use as determined by bioassay testing using the results of an LC50 96 h test on *Pimephales promelas* expressed as Propylene Glycol.

Pavement and runway deicing and anti-icing agents approved by the FAA include urea, ethylene glycol, potassium acetate, calcium magnesium acetate (CMA), sodium acetate, and sodium formate. Due to negative environmental impacts from urea and/or glycols, many airports including T.F. Green currently use more environmentally benign agents, such as potassium acetate and sodium formate. Corrosion inhibitors are often added to runway deicers to meet the Society of Automotive Engineers (SAE) and United States military specifications (MIL-SPEC). Potassium acetate is currently the most commonly used runway and pavement deicer and is typically applied in its liquid form.

The permit does not authorize the use of Urea or Glycols for runway or pavement deicing and requires RIAC to implement runway and pavement deicing BMPs that include pollution prevention such as choosing environmentally sensitive products and source reduction BMPs such as anti-icing techniques. The proposed BMPs when implemented will meet the narrative criteria of "no toxics in toxic amounts".

Nuisance Odors

The Rhode Island Water Quality (RIWQ) Regulations state that "all waters shall be free from pollution in concentrations or combinations that ... produce odor ... to such a degree as to create a nuisance, or interfere with the existing or designated uses". The RIWQ Regulations also establish class-specific criteria for fresh waters for water bodies designated as Class B as "None in such concentrations that would impair any usages specifically assigned to this class nor cause taste or odor in edible portions of fish."

Fresh propylene glycol has a "sweet" odor. Degradation of propylene glycol creates n-Propyl Aldehyde which produces a strong "onion-like" odor. Mercaptans and sulfide compounds are breakdown products associated with propylene glycol and can cause offensive odors. Relatively low concentrations of glycol degrading in anaerobic conditions and the presence of sulfur can cause odors. In 2001, 2003, and 2004 nuisance odors have been documented at the storm water outfalls serving areas where deicing occurs and in the receiving waters downstream of T.F. Green Airport.

Since the permit was reissued in 2004 and an odor control system installed at the airport odor complaints apparently related to deicing activities have decreased from 9 complaints in 2005 to one complaint in years 2007 and 2008. Since 2009 no odor complaints have been received by RIDEM.

Nuisance Bacteria

The RI WQ Regulations establish a narrative Water Quality Criteria for nutrients of "none in such concentration that would impair any usages specifically assigned to said Class, or cause undesirable or nuisance aquatic species associated with cultural eutrophication ...". Outfall inspections are performed by RIAC as part of the Annual Dry Weather Screening Reports conducted to satisfy Part I.B.4.e of the permit document visual inspection of the outfalls for evidence of bacterial growths.

Foaming

The RI WQ Regulations establish a narrative criterion for foam of "none allowable". Aircraft deicing chemicals are known to contain additives including surfactants. The permit contains a condition that states that "The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time". The permit requires RIAC to inspect outfalls during monitoring events and document observed foaming at outfalls. The permit also includes monitoring certain outfalls for surfactants.

V. **Comment Period, Hearing Requests, and Procedures for Final Decisions**

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the Rhode Island Department of Environmental Management, Office of Water Resources, 235 Promenade Street, Providence, Rhode Island, 02908-5767. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to the Rhode Island Department of Environmental Management. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Director finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Director will respond to all significant comments and make these responses available to the public at DEM's Providence Office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within thirty (30) days following the notice of the final permit decision any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of Rule 49 of the Regulations for the Rhode Island Pollutant Discharge Elimination System.

VI. **DEM Contact**

Additional information concerning the permit may be obtained between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, excluding holidays, from:

Aaron Mello
RIPDES Program
Office of Water Resources
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-6820x7405

April 10, 2012
Date


Eric A. Beck, P.E.
Supervising Sanitary Engineer
RIPDES Permitting Section
Office of Water Resources
Department of Environmental Management

**AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended,

**Rhode Island Airport Corporation
2000 Post Road
Warwick, Rhode Island**

is authorized to discharge from a facility located at

**T. F. Green Airport
2000 Post Road
Warwick, Rhode Island**

to receiving waters named

**Unnamed Tributaries of Warwick Pond and Buckeye Brook,
and Tuscatucket Brook**

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on _____.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on November 12, 2004.

This permit consists of 29 pages in Part I including effluent limitations and monitoring requirements, Storm Water Pollution Prevention Plan requirements, implementation schedules and reporting, etc. and 10 pages in Part II including General Conditions.

Signed this _____ day of _____, 2011.

DRAFT

Angelo S. Liberti, P.E., Chief of Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through permit expiration date, the permittee is authorized to discharge from outfall serial number(s) designated 002A, 003A, 008A, and 010A. Such discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>		<u>Concentration - specify units</u>		<u>Monitoring Requirement</u>	
	<u>Quantity - specify units</u> Average Monthly --- GPD	<u>Maximum</u> Daily --- GPD	<u>Average</u> Monthly *(Minimum)	<u>Average</u> Weekly *(Average)	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow	---	---			Quarterly ⁽⁶⁾⁽⁷⁾	Cont/Estimate ⁽¹⁾
pH			(6.5 SU)		Quarterly ⁽⁶⁾⁽⁷⁾	Measurement
Temperature		--- °F			Quarterly ⁽⁶⁾⁽⁷⁾	Measurement
Oil & Grease				15 mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
TSS		--- mg/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
BOD ₅		--- mg/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Propylene Glycol		--- mg/l	---	---	Quarterly ⁽⁶⁾	Grab/Composite ⁽²⁾⁽³⁾
COD		--- mg/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Potassium(K ⁺)		--- mg/l	---	---	Quarterly ⁽⁶⁾	Grab/Composite ⁽²⁾⁽³⁾
Sodium(Na ⁺)		--- mg/l	---	---	Quarterly ⁽⁶⁾	Grab/Composite ⁽²⁾⁽³⁾
Surfactants		--- ug/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Dissolved Oxygen		--- mg/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Measurement
Total Organic Carbon (TOC)		--- mg/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Fecal Coliform		--- MPN/100 ml	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
Total Aluminum		--- ug/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Chromium		--- ug/l	---	---	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾

Effluent Characteristic	Discharge Limitations			Monitoring Requirement
	Quantity - specify units Average Monthly Maximum Daily	Concentration - specify units Average Monthly Average Weekly Maximum Daily	Sample Type	
Total Copper	---	ug/l	ug/l	Quarterly ⁽⁶⁾⁽⁷⁾ Grab/Composite ⁽²⁾⁽³⁾
Total Iron	---	mg/l	mg/l	Quarterly ⁽⁶⁾⁽⁷⁾ Grab/Composite ⁽²⁾⁽³⁾
Total Lead	---	ug/l	ug/l	Quarterly ⁽⁶⁾⁽⁷⁾ Grab/Composite ⁽²⁾⁽³⁾
Total Zinc	---	ug/l	ug/l	Quarterly ⁽⁶⁾⁽⁷⁾ Grab/Composite ⁽²⁾⁽³⁾

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

- (1) Average Monthly Flow and Maximum Daily Flow shall be determined by the use of a continuous flow monitor for twelve (12) hours following the initiation of precipitation that generates runoff for Outfalls 002A, 003A, and 008A. Outfall 010A is not equipped with a continuous monitor. Average Monthly Flow shall be calculated and reported for each outfall as the arithmetic average of the flow measurements made during each monitoring event over the duration of the event for Outfalls 002A, 003A, and 008A. Average Monthly flow shall be calculated and reported for Outfall 010A using the average intensity for the duration of the event. Maximum Daily Flow for Outfalls 002A, 003A, and 008A shall be reported for each outfall as the total of the flow measurements made during each monitoring event. Maximum Daily Flow for Outfall 010A shall be calculated using the depth and duration of precipitation as water equivalent for the event.
- (2) Analytical results reported as Average Monthly must be determined from composite samples taken with a continuous sampler or as a combination of a minimum of twelve-(12) sample aliquots taken during the first twelve-(12) hours following the initiation of precipitation that generates runoff with each aliquot being at least 100 ml and collected at a minimum of hourly intervals. Composite samples can be either flow-weighted or time-weighted. During snow events, the start of precipitation shall be assumed to occur when the total accumulation of snowfall is 0.5 inches in depth. During other freezing (i.e., sleet, freezing rain) or non-freezing (i.e., rain) precipitation events, the start of precipitation shall be assumed to occur when the total accumulation is 0.1 inches in depth.
- (3) Analytical results reported as Maximum Daily must be the maximum of the composite samples or the maximum of the twelve (12) sample aliquots collected during the twelve (12) hour period for all measured storm events for each reporting quarter in accordance with Note (2) above.
- (4) Analytical results reported as Average Monthly must be determined from the arithmetic average of three (3) individual hourly grab samples taken during the first three (3) hours following the initiation of precipitation that generates runoff.
- (5) Analytical results reported as Maximum Daily must consist of a single grab sample collected during the period starting twenty (20) minutes following the initiation of precipitation that generates runoff and commencing no later than three (3) hours following the initiation of precipitation that generates runoff. If the collection of a grab sample during the specified time period could not be achieved, a sample can be taken during the a subsequent period not to exceed six (6) hours following the initiation of precipitation that generates runoff, providing the permittee submit with the monitoring report, a description of why a sample during the specified period could not be collected.
- (6) Sampling required for Quarter 1 and Quarter 4. One (1) precipitation event shall be monitored for Quarter 1 and one (1) precipitation event shall be monitored for Quarter 4 while aircraft deicing is occurring. Quarter 1 is defined as the period from January 1 through March 31, and Quarter 4 is defined as the period from October 1 through December 31.
- (7) Sampling required for Quarter 2 and Quarter 3. One (1) precipitation event shall be monitored for Quarter 2 and one (1) precipitation event shall be monitored for Quarter 3. Quarter 2 is defined as the period from April 1 through June 30, and Quarter 3 is defined as the period from July 1 through September 30.

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfalls 002A, 003A, 008A, and 010A.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) designated 001A, 004A, 005A, 006A, 007A, 009A, 011A, 012A, and 013A. Such discharges shall be limited and monitored by the permittee as specified below.

Effluent Characteristic	Discharge Limitations		Concentration - specify units	Monitoring Requirement	
	Quantity - specify units	Average		Measurement Frequency ⁽⁶⁾	Sample Type
Flow	Average Monthly	Maximum Daily	Average Weekly *(Average)	2 Year ⁽⁶⁾	Estimate ⁽⁴⁾
pH		---		2 Year ⁽⁶⁾	Measurement
Oil & Grease		(6.5 SU)		2 Year ⁽⁶⁾	Grab ⁽²⁾⁽³⁾
TSS		---		2 Year ⁽⁶⁾	Grab/Composite ⁽¹⁾⁽³⁾
BOD ₅		---		Annual	Grab/Composite ⁽¹⁾⁽³⁾
Fecal Coliform		---		Annual	Grab ⁽²⁾⁽³⁾
Potassium (K ⁺)		---		Annual	Grab/Composite ⁽¹⁾⁽³⁾
Sodium (Na ⁺)		---		Annual	Grab/Composite ⁽¹⁾⁽³⁾

--- signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

⁽¹⁾ Results reported as Average Monthly must be determined from composite samples consisting of a minimum of three (3) sample aliquots taken during the first three (3) hours following the initiation of precipitation with each aliquot being at least 100 ml and collected intervals no less than fifteen (15) minute. Composite samples can be either flow-weighted or time-weighted. During snow events, the start of precipitation shall be assumed to occur when the total accumulation of snowfall is 0.5 inches in depth. During other freezing (i.e., sleet, freezing rain) or non-freezing (i.e., rain) precipitation events, the start of precipitation shall be assumed to occur when the total accumulation is 0.1 inches in depth.

⁽²⁾ Analytical results reported as Average Monthly must be determined from the arithmetic average of three (3) individual hourly grab samples taken during the first three (3) hours following the initiation of precipitation that generates runoff.

⁽³⁾ Analytical results reported as Maximum Daily must consist of a single grab sample collected during the period starting twenty (20) minutes following the initiation of precipitation that generates runoff and commencing no later than three (3) hours following the initiation of precipitation that generates runoff. If the collection of a grab sample during the specified time period could not be achieved, a sample can be taken during the a subsequent period not to exceed six (6) hours following the initiation of precipitation that generates runoff, providing the permittee submit with the monitoring report, a description of why a sample during the specified period could not be collected.

⁽⁴⁾ Maximum Daily Flow shall be the calculated flow for the sampling event using depth and duration of precipitation as water equivalent for the event.

⁽⁵⁾ Sampling required for at least one (1) precipitation event during Quarter 1 or Quarter 4 while aircraft deicing is occurring. Quarter 1 is defined as the period from January 1 through March 31, and Quarter 4 is defined as the period from October 1 through December 31.

⁽⁶⁾ For Flow, pH, Oil & Grease, and TSS one (1) sampling event shall occur during Quarter 1 or Quarter 4 per the requirements of Footnote (5). The second sampling event may occur during a precipitation event during any calendar quarter.

* Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfalls 001A, 004A, 005A, 006A, 007A, 009A, 011A, 012A and 013A.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 100A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Quantity - specify units		Discharge Limitations		Concentration - specify units		Monitoring Requirement	
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Average Weekly	Maximum Daily	Measurement Frequency	Sample Type
	--- GPD ⁽¹⁾	--- GPD ⁽²⁾	*(Minimum)	*(Average)	*(Maximum)			
Flow	---	---					1/Discharge	Estimate ⁽³⁾
pH			(6.5 SU)		(9.0 SU)		1/Discharge	Measurement
Benzene			5.0 ug/l		5.0 ug/l		1/Discharge	Grab
Toluene			--- ug/l		--- ug/l		1/Discharge	Grab
Ethylbenzene			--- ug/l		--- ug/l		1/Discharge	Grab
Total Xylenes			--- ug/l		--- ug/l		1/Discharge	Grab
Total BTEX			100 ug/l		100 ug/l		1/Discharge	Grab
MTBE			--- ug/l		--- ug/l		1/Discharge	Grab
Total Iron			--- mg/l		--- mg/l		1/Discharge	Grab
Benzo (a) Anthracene			--- ug/l		--- ug/l		1/Discharge	Grab
Benzo (a) Pyrene			--- ug/l		--- ug/l		1/Discharge	Grab
Benzo (b) Fluoranthene			--- ug/l		--- ug/l		1/Discharge	Grab
Benzo (k) Fluoranthene			--- ug/l		--- ug/l		1/Discharge	Grab
Chrysene			--- ug/l		--- ug/l		1/Discharge	Grab
Dibenzo (a,h) Anthracene			--- ug/l		--- ug/l		1/Discharge	Grab
Indeno (1,2,3-cd) Pyrene			--- ug/l		--- ug/l		1/Discharge	Grab

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>			<u>Monitoring Requirement</u>	
	Quantity - specify units Average Monthly	Concentration - specify units Average Monthly *(Minimum)	Average Weekly *(Average)	Measurement Frequency	Sample Type
Acenaphthene	Maximum Daily	--- ug/l	--- ug/l	1/Discharge	Grab
Acenaphthylene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Anthracene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Benzo (ghi) Perylene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Fluoranthene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Fluorene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Naphthalene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Phenanthrene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Pyrene	--- ug/l	--- ug/l	--- ug/l	1/Discharge	Grab
Total Petroleum Hydrocarbon	--- mg/l	--- mg/l	1.0 mg/l	1/Discharge	Grab

---signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

(1) Average Monthly Flow shall be reported as the arithmetic average of the Maximum Daily Flows recorded for each discharge during the quarterly reporting period.

(2) Maximum Daily Flow shall be reported as the maximum of the flow recorded for each discharge during the quarterly reporting period

(3) Monitor flow and submit a flow log with the monitoring results. The flow log shall include the rate and duration of flow including the time(s) of day when flow commences and ceases. At a minimum, the flow must be measured and reported each time a sample is collected.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 100A (the effluent from the AST fuel farm water treatment system).

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 200A. The permittee shall provide real time monitoring of concentrations upstream of the diversion point and flow monitoring at a location downstream of the diversion point. All flows that bypass the collection and treatment system and are discharged to waters of the state (i.e. not diverted to storage, treatment and discharge to the sanitary sewer system) will be limited and monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Quantity - specify units</u>		<u>Discharge Limitations Concentration - specify units</u>		<u>Measurement Frequency</u>	<u>Monitoring Requirement</u>	<u>Sample Type</u>
	<u>Average Monthly</u>	<u>Maximum Daily</u>	<u>Average</u>	<u>Maximum Weekly</u>			
Flow, by-passing treatment ⁽¹⁾			--- GPM	0 GPM	Continuous ⁽⁴⁾		Flow meter
Bypass Volume ⁽¹⁾				--- gallons	Once/Bypass Event ⁽⁴⁾		Calculated
Number of Bypass Events ⁽¹⁾				---	Once/Bypass Event ⁽⁴⁾		Calculated
Total Organic Carbon (TOC) ⁽¹⁾			--- mg/l	--- mg/l	Once/15 min. ⁽²⁾⁽⁴⁾		Online Instrument
Propylene Glycol (PG) ⁽¹⁾			--- mg/l	--- mg/l	Once/15 min ⁽³⁾⁽⁴⁾		Correlation

⁽¹⁾ Flow monitoring will occur downstream of the diversion point prior to mixing with other flows and represents flow that is discharging toward the outfall. A Bypass Event is defined as a discharge that begins after the approved Response Period and the calculated PG concentration exceeds 2,950 mg/l and ends when the calculated PG is less than 2950 mg/l or flow ceases. The average flow bypassing treatment, the average calculated PG concentration and Bypass Volume shall be recorded for each Bypass Event. The approved Response Period represents the period between measurement of a calculated PG concentration greater than 2,950 mg/l and cessation of flow toward the outfall due to pump start-up, dewatering of the pump wet well and dewatering of the outfall line at the point of flow measurement. The response period shall be established as ten minutes, and shall be subject to modification based on assessment during the start-up and commissioning of the system as described in Part I.B.4.a.(2). Permittee shall submit a flow log with the monitoring results for any time period where the calculated PG concentration exceeds the diversion limit of 2,950 mg/l, which includes the duration of the bypass flow, the time(s) of day when the bypass flow commences and ceases, the calculated PG concentration and the bypass volume.

⁽²⁾ TOC concentration shall be measured every 15 minutes at a location upstream of the diversion point and reported only for bypass events.

⁽³⁾ The correlation between online Total Organic Carbon (TOC) measurement and propylene glycol (documented in the SWPPP and agreed to by RIDEM) shall be used to estimate the propylene glycol concentration.

⁽⁴⁾ Sampling only required for Quarter 1 and Quarter 4. Quarter 1 is defined as the period from January 1 through March 31, and Quarter 4 is defined as the period from October 1 through December 31.

The number of bypass events shall be reported as the total number of events during the reporting period rather than Maximum

PART 1

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

5. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 300A. The permittee shall provide real time monitoring of concentrations upstream of the diversion point and flow monitoring at a location downstream of the diversion point. All flows that bypass the collection and treatment system and are discharged to waters of the state (i.e. not diverted to storage, treatment and discharge to the sanitary sewer system) will be limited and monitored by the permittee as specified below:

<u>Effluent Characteristic</u>	<u>Quantity - specify units</u>		<u>Discharge Limitations</u> Concentration - specify units		<u>Monitoring Requirement</u>	
	<u>Average Monthly</u>	<u>Maximum Daily</u>	<u>Average</u>	<u>Average Weekly</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow, by-passing treatment ⁽¹⁾			--- GPM		0 GPM	Flow meter
Bypass Volume ⁽¹⁾					--- gallons	Calculated
Number of Bypass Events ⁽¹⁾					---	Calculated
Total Organic Carbon (TOC) ⁽¹⁾			--- mg/l		--- mg/l	Online Instrument
Propylene Glycol (PG) ⁽¹⁾			--- mg/l		--- mg/l	Correlation

⁽¹⁾ Flow monitoring will occur downstream of the diversion point prior to mixing with other flows and represents flow that is discharging toward the outfall. A Bypass Event is defined as a discharge that begins after the approved Response Period and the calculated PG concentration exceeds 1,000 mg/l and ends when the calculated PG is less than 1,000 mg/L or flow ceases. The average flow bypassing treatment, the average calculated PG concentration and Bypass Volume shall be recorded for each Bypass Event. The approved Response Period represents the period between measurement of a calculated PG concentration greater than 1,000 mg/l and cessation of flow toward the outfall due to pump start-up, dewatering of the pump wet well and dewatering of the outfall line at the point of flow measurement. The response period shall be established as ten minutes, and shall be subject to modification based on assessment during the start-up and commissioning of the system as described in Part I.B.4.a.(2). Permittee shall submit a flow log with the monitoring results for any time period where the calculated PG concentration exceeds the diversion limit of 1,000 mg/l, which includes the duration of the bypass flow, the time(s) of day when the bypass flow commences and ceases, the calculated PG concentration and the bypass volume.

⁽²⁾ TOC concentration shall be measured every 15 minutes at a location upstream of the diversion point and reported only for bypass events.

⁽³⁾ The correlation between online Total Organic Carbon (TOC) measurement and propylene glycol (documented in the SWPPP and agreed to by RIDEM) shall be used to estimate the propylene glycol concentration.

⁽⁴⁾ Sampling only required for Quarter 1 and Quarter 4. Quarter 1 is defined as the period from January 1 through March 31, and Quarter 4 is defined as the period from October 1 through December 31.

The number of bypass events shall be reported as the total number of events during the reporting period rather than Maximum

6. Special Conditions/Authorizations/Prohibitions:

This permit also authorizes the discharge of storm water from outfalls 004B, 004C, 006B, 006C, 006D, 007B and 014A. Outfalls 004A, 006A, and 007A are in the same drainage areas with similar industrial activities as outfalls 004B, 004C, 006B, 006C, 006D and 007B, therefore, monitoring from outfalls 004A, 006A, and 007A are considered representative. Outfall 14A is in a drainage area similar to 13A and therefore monitoring from outfall 013A is considered representative.

- a. Non-storm water discharges including those from rubber removal practices and dry weather discharges of deicing/anti-icing chemicals are not authorized by this permit. Dry weather discharges are those discharges generated by processes other than those included in the definition of storm water. In RIPDES Rule 3, the definition of storm water includes storm water runoff, snowmelt runoff, and surface runoff and drainage. All other discharges constitute non-storm water discharges. Discharges of process wastewater or spills in snowmelt runoff are not authorized. Discharges of aircraft deicing/anti-icing fluid (ADF/AAF) and/or pavement deicing materials entrained in storm water constitute storm water discharges for purposes of this permit.
- b. Unless identified by the permittee or the RI DEM as significant sources of pollutants to waters of the United States, the following non-storm water discharges are authorized under this permit to enter the storm water drainage system: discharges from fire fighting activities; fire hydrant flushings; exterior building and sidewalk washdown that does not use detergents; lawn watering; uncontaminated groundwater; springs; air conditioning condensate; potable waterline testing; and foundation or footing drains where flows are not contaminated with process materials, such as solvents, or contaminated by contact with soils, where spills or leaks of toxic or hazardous materials has occurred. If any of these discharges may reasonably be expected to be present and to be mixed with storm water discharges, they must be specifically identified and addressed in the facility's Storm Water Pollution Prevention Plan (SWPPP).
- c. This permit does not authorize discharges to the separate storm sewer system or to waters of the State from floor drains and trench drains located inside of buildings and/or hangars.
- d. This permit does not authorize discharges to the separate storm sewer system or to waters of the State from vehicle, airplane, or equipment washing activities.
- e. This permit does not authorize the use of any Type I aircraft deicing fluid (ADF) which displays greater toxicity than the products currently used at the Airport. The toxicity of the Type I ADF products expressed as Propylene Glycol shall not be lower than 3,300 mg/l as determined by a 96-h LC₅₀ bioassay test on *Pimephales promelas* (Fathead minnow).
- f. The pH of the effluent shall not be less than 6.5 nor greater than 9.0 standard units at any time, unless these values are exceeded due to natural causes or as a result of the approved treatment processes.
- g. All samples, except those collected at internal Outfalls 200A and 300A, must be collected from a discharge(s) resulting from a representative storm event. A representative storm event is precipitation that (a) occurs at least seventy-two (72) hours from the previous measurable storm event, and (b), is 0.1 inches water equivalent per twenty-four (24) hours in magnitude. The sampling event shall be compared to the average storm event in Rhode Island for both depth and duration.

The average storm event in Rhode Island is 0.7 inches in depth and 12 hours in duration.

- h. In addition to the required sampling results submitted in accordance with Part I.A.1. and I.A.2. of this permit, the permittee must provide the date and duration (hours) of the storm event sampled, the total depth of rainfall (inches), and the total volume of runoff (Ft³).
 - i. If the permittee is unable to collect samples due to adverse climatic conditions or lack of a representative storm event during the entire quarterly monitoring period, the permittee must submit, in lieu of sampling data, a description of why samples could not be collected, including available precipitation data for the monitoring period.
 - j. Within one (1) year after the Deicer Fluid Collection and Management system described in Part I.B.4.a.(1) is operational, RIAC will evaluate pavement surface conditions and drainage for potential pooling issues in terminal deicing application areas, and if necessary and feasible, engineered and/or operational controls to mitigate pooling issues will be identified and implemented. However, if ramp construction in the proposed terminal deicing area occurs before the collection system is operational, any necessary and feasible engineered or operational controls will be identified and implemented to coincide with such construction. Within the deadline above, RIAC will provide RI DEM with a report information detailing the evaluation and basis for their determination regarding engineered or operational controls. Pooling for the purposes of this document is defined as the presence of free-standing water one hour or more than the end of the most recent precipitation event at an average depth greater than a half inch and an area greater than 100 square feet.
 - k. The discharges shall not cause visible discoloration of the receiving waters that would impair any usages specifically assigned to the receiving waters.
 - l. The discharges shall not cause odors in the receiving waters to such a degree as to create a nuisance or interfere with the existing or designated uses.
 - m. The discharge shall contain neither a visible oil sheen, foam, nor floating solids at any time.
 - n. The discharges shall not cause or contribute to any stream bank erosion and/or cause or contribute to any soil erosion and sedimentation.
7. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 ug/l);
 - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitro-phenol; and one milligram per liter (1 mg/l) for antimony;
 - (3) Five (5) times the maximum concentration value reported for that pollutant

in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or

- (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.
 - b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) Five hundred micrograms per liter (500 ug/l);
 - (2) One milligram per liter (1 mg/l) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or
 - (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.
 - c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or by-product any toxic pollutant which was not reported in the permit application.
8. Aboveground Storage Tank (AST) Fuel Farm:
- a. The permittee shall properly operate and maintain the AST fuel farm storm water treatment system. Mechanical failure or breakthrough of the treatment system causing an exceedance of any permit limits shall be immediately reported to the Office of Water Resources.
 - b. The permittee shall treat all stormwater pumped from the containment dike associated with the AST fuel farm with a Granular Activated Carbon treatment system designed to meet the effluent limitations listed in Part I.A.3. The system shall not be modified without written approval from the Office of Water Resources.
 - c. The treatment system shall be inspected at a minimum of once per month to assure the system is operating efficiently and to look for evidence of iron bacteria build-up. As a result of these inspections, appropriate actions shall be taken immediately to resolve any problems discovered during the inspection (i.e., removal of iron scale). Records documenting the inspections and any actions taken shall be retained and made available to the Office of Water Resources upon request.
 - d. Discharge shall cease if any of the contaminants listed in Part I.A.3. are found in the effluent above the detection limits listed in Part I.C. The discharge may recommence once steps have been taken to ensure the limits will not be exceeded again. At a minimum, these steps shall include replacement of the activated carbon filter.
9. This permit serves as the State's Water Quality Certificate for the discharges described herein.

B. STORM WATER POLLUTION PREVENTION PLAN REQUIREMENTS

1. As of the effective date of this permit, RIAC shall implement the Storm Water Pollution

Prevention Plan (referred to herein as the "SWPPP" and "the Plan") developed by the permittee dated August 2009. The SWPPP shall be maintained in accordance with good engineering practices and shall identify potential sources of pollutants that may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. The SWPPP shall include a site map that consists of a delineation of the drainage area of each storm water outfall, each existing structural control measure to reduce pollutants in storm water runoff, locations where significant materials are exposed to storm water, locations where significant leaks or spills have occurred, a delineation of all impervious surfaces, all surface water bodies, all separate storm sewers, and the locations of the following activities where such areas are exposed to storm water: fueling stations, vehicle and equipment maintenance and/or cleaning areas, material handling areas, material storage areas, process areas, waste disposal areas, airplane deicing and anti-icing areas, glycol storage, processing and handling areas, and runway deicing and rubber removal. The site map shall also include: all underground injection control (UIC) systems, including systems that are owned or operated by RIAC's tenants; all outfall pipes, including pipes that are owned or operated by RIAC's tenants; all aboveground storage tanks (ASTs) and underground storage tanks (USTs), including tanks that are owned or operated by RIAC's tenants; and all floor drains in each building, including floor drains that are located in buildings that are owned or operated by RIAC's tenants (the location of the discharge point must be provided for each floor drain). The SWPPP shall identify in the site map airplane deicing areas, glycol storage areas, and vehicle washing areas and contain procedures to ensure that these activities occur only in the areas identified in the SWPPP. In addition, the Plan shall describe and ensure the implementation of Best Management Practices (BMPs) that are to be used to reduce or eliminate 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; provide a description of potential sources which may be reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility; and provide a description of storm water management controls appropriate for the facility and implement such controls.

2. The SWPPP shall be signed by the permittee in accordance with RIPDES Rule 12 and retained on-site. The SWPPP shall be made available upon request by the DEM.
3. The Director may notify the permittee at any time that the Plan does not meet one or more of the minimum requirements of the permit. After such notification from the Director, the permittee shall make changes to the Plan and shall submit to the Director a written certification that the requested changes have been made. Unless otherwise provided by the Director, the permittee shall have thirty (30) days after such notification to make the necessary changes. The permittee shall immediately amend the Plan whenever: 1) 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; 2) a release of reportable quantities of hazardous substances and oil; or 3) if the SWPPP proves to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Changes must be noted and then submitted to this Department within thirty (30) days of amending the plan. Amendments to the Plan may be reviewed by the Department in the same manner as specified above.
4. In addition to the requirements in Part I.B.1., the SWPPP, shall contain the following items:
 - a. Deicing Fluid Collection and Management. A description of equipment and operation and management procedures related to deicing fluid usage and collection. The description of such operations and procedures must address the following minimum components:

- (1) *Collection Program Operating Procedures.* Standard operating procedures and overall glycol recovery goals for the collection program must be detailed. The terminal area and cargo glycol collection system shall be sized to collect 99.9% of all flows above the diversion concentrations (2,950 mg/l for the terminal area and 1,000 mg/l for the cargo area) based on simulations of 62 years of historical data. Operations and equipment for the various components of the collection program that must be addressed include, at a minimum, the following:
- i. Implementation of the Deicer Management System of real-time monitoring and collection, storage and discharge to the sanitary sewer system of glycol-impacted stormwater; from the terminal deicing area that exceeds 2,950 mg/l propylene glycol (or its surrogate equivalent); and, glycol-impacted stormwater from the cargo deicing area that exceeds 1,000 mg/l propylene glycol (or its surrogate equivalent);
 - a. The diverted glycol-impacted storm water from the terminal and cargo area collection systems will be treated on-site and discharged to the City of Warwick sanitary sewer system.
 - b. The terminal area collection system will be installed with one point of diversion, but be designed to be capable of incorporating two additional diversion points.
 - c. The Deicer Management System will function in concert with the glycol blending facility.
 - d. If the GlyCAST™ model or other simulation is used as a decision making tool to justify structural changes that are subject to approval by the RI DEM after the diversion system is in place, RIAC will calibrate the model with empirical data collected from permit sampling requirements and the operation of the diversion system. RIAC will provide RI DEM with the calibration data.
 - ii. Seasonal collection program operating schedule including procedures and a schedule to ensure that all collection, handling, and processing equipment is on-site and operational prior to October 15th of each year. The operating schedule shall be submitted annually with the third quarter Discharge Monitoring Report (DMR) forms due by October 15th;
 - iii. Dry weather and wet weather operating procedures;
 - iv. Management and description of glycol storage tanks;
 - v. Recordkeeping forms and procedures;
 - vi. Procedures for calibration and assessment of the on-line TOC sample collection and analysis system associated with the cargo and terminal area deicer fluid collection systems and for determination of the corresponding propylene glycol concentrations. These procedures shall include collection of discrete samples (from both the cargo and terminal area systems) during a deicing event, when flow exists at the downstream sampling location for analysis of TOC and PG.
 - vii. Operation of mobile collection units, included a unit dedicated to the Cargo area for dry weather and secondary deicing
 - a. Operation of mobile collection units and glycol recovery vehicles

during dry weather and wet weather deicing events when activity within the terminal and cargo area is conducive to GRV use collection (i.e. "low activity wet weather") and at secondary deicing locations.

- b. Location and operation of catch basin valve inserts;
- c. Procedures for ensuring that aircraft deicing fluids (ADFs) do not enter the storm drainage system near secondary deicing areas. Catch basin inserts in secondary deicing areas shall remain closed during deicing events. The inserts may be opened once the deicing fluids have been collected.
- d. Collection equipment for each area where deicing occurs and associated temporary or day storage tanks of adequate capacity located in an area that will allow collection equipment to expeditiously resume collection activities after reaching capacity.
- e. Training program for secondary deicing and dry weather glycol collection and processing facility personnel
- f. Procedures for assessment of the period between measurement of PG concentrations that exceeds the diversion limit for both the terminal and cargo areas and cessation of flow toward the outfall due to pump start-up, dewatering of the pump wet well and dewatering of the outfall line at the point of flow measurement. The assessment shall be conducted during start-up and commissioning of the collection and treatment system and the results submitted by February 15, 2015. The permittee may request or DEM may initiate permit modification procedures to change the approved Response Period based on the results of this assessment.

(2) *Aircraft and Pavement Deicing Material Usage, Storage, and Collection.* The permittee shall implement practices for the management of aircraft and pavement deicing materials. The practices shall be designed to minimize the discharge of aircraft deicing fluids. Practices should include encouraging airlines to consider minimizing fluids applied to aircraft through improved application methods and innovative deicing technologies. Procedures shall include an evaluation of measures to minimize contact with storm water, to minimize the volumes of glycols used (with due consideration of FAA requirements and safety) as well as measures to prevent releases from accidental leaks and spills of deicing materials. The permittee shall develop an airport deicing management plan. This plan shall establish practices and procedures for collection of aircraft deicing fluids as well as pavement deicers. This plan shall be developed in cooperation with tenants and personnel involved with application and collection of deicing materials. With due consideration of safety and other regulatory requirements, such as FAA, the goal of the program shall be to minimize the discharge of deicing materials as follows:

- i. The permittee shall evaluate ADFs that are new or demonstrate less aquatic toxicity than those currently in use. Annually the permittee must provide information to tenants identifying less toxic ADFs encouraging tenants to utilize the most environmentally sensitive ADFs.
- ii. The permittee shall evaluate the feasibility of preventative anti-

icing techniques. Annually the permittee shall provide information to tenants identifying various practices and encouraging the tenants to implement techniques as practicable.

- iii. The permittee shall evaluate aircraft deicing fluid application practices to identify means to reduce the discharge of aircraft deicing fluid. This shall include an evaluation of technologies such as hot air-low flow application equipment and techniques such as protective enclosures for applicators as well as varying the aircraft deicing fluid concentrations dependent upon ambient conditions. Annually the permittee shall provide information to tenants identifying various practices and encouraging the tenants to implement techniques as practicable.
- iv. Implements BMPs for the management of glycol contaminated snow or frozen precipitation with the goal of reducing the amount of glycol discharged to the storm water system from melting snow contaminated with glycol and increasing the amount of glycol collected. Glycol impacted snow from the terminal and cargo areas will be plowed to areas within the drainage area of the terminal area and cargo glycol collection systems. Discharge from the portable snow melter will be routed to the terminal and cargo diversion structures where runoff greater than or equal to 2,950 and 1,000 mg/l of glycol from the terminal area and cargo areas, respectively will be collected. Collected snowmelt above the diversion concentrations shall be stored, treated and discharged to the sanitary sewer system. Snow melt will not be detained to enable dilution below the propylene glycol limits identified above point. Subject to the requirements above, snow melt/runoff concentrations below the concentrations identified may be discharged to the outfall.
- v. Provides secondary containment for all aircraft deicing fluid storage facilities. These facilities shall be designed to reduce or eliminate the release of glycol to the storm sewer system.
- vi. Implements BMPs for glycol and pavement deicer (i.e. potassium acetate and sodium formate) storage, transfer, and application practices that include a glycol inventory system and glycol handling procedures for all tenants. The inventory program must include daily record keeping of the amount purchased, amount used, a routine monthly reconciliation and routine visual inspection of storage facilities and handling equipment for drips, leaks, and spills. The BMPs must also include Standard Operating Procedures (SOPs) for reporting and responding to spills that includes basic information to be reported to RIAC and DEM (as necessary) including the amount spilled supported by inventory reconciliation.
- vii. Implement an annual pavement sealing program for aircraft deicer application areas in order to enhance capture and conveyance of glycol impacted storm water and reduce potential for vertical migration.

- viii. Provide a statement indicating that to the best of the permittee's knowledge there are no storm water or non-storm water connections to the terminal drainage system (that is directed to the diversion point or the western oil water separator located in the mid field area) that are not related to the dedicated terminal deicing areas. If any such connections are discovered, the ancillary flows will be rerouted such that they do not contribute to the terminal collection system flow.
-
- b. Runway Rubber Removal Procedures. This permit does not authorize the dry weather discharge of chemicals or wastewater associated with pavement and runway de-rubberizing. The permittee shall implement BMPs that include but are not limited to; performing all runway de-rubberizing during dry weather, using environmentally sensitive products, temporarily sealing the collection system, and rinsing/washing the product off the paved surfaces directed to grassy areas that infiltrate, or impervious areas where it shall be collected and disposed of prior to the next precipitation event.
 - c. Odor and Bacteria Growth Response. The permittee shall develop and implement procedures to identify and respond to occurrences of odors and bacteria growths at outfalls and receiving streams that may be associated with airplane and runway deicing fluids, and amend the SWPPP to include these procedures. At a minimum, the procedures shall include routine observations of storm water outfalls and the receiving streams that receive discharges of storm water associated with deicing activities for the presence of odors and bacteria growths and procedures to respond to the identified odors and bacteria growths.
 - (1) Within twenty-four (24) hours of being notified by RIDEM that an odor complaint that violates state water quality standards has been received, the permittee shall perform the following:
 - i. Inspect all outfalls associated with the complaint for dry weather flows and obtain samples of all dry weather discharges and analyze for propylene glycol;
 - ii. Obtain instream samples at the location of the odor complaint and analyze for propylene glycol;
 - iii. Inspect all storm water collection system appurtenances and deicing areas associated with the complaint for evidence of residual glycols and clean as appropriate;
 - iv. Within five (5) days of receipt of laboratory analysis for the abovementioned instream samples, the permittee shall submit a report that describes the following: (a) Dates/times complaints received; (b) Dates/times notified by RIDEM; (c) Summary of recent deicing activities and collection efforts that includes the climatic conditions, amount of deicing chemicals used and recovered, a description of the glycol management BMPs implemented, locations of observed odors, measured concentrations of glycol in the discharge and the receiving stream, remedial actions to be taken to mitigate future occurrences and recommend additional investigations, controls and amendments to the SWPPP as necessary.

- v. If the odors are evident during a dry weather period or after the deicing season has ended and/or the dry weather discharges from storm water outfalls are found to contain detectable levels of propylene glycol, the recommendations must include a scope of work and implementation schedule to perform additional investigations of the collection system and an investigation of the potential for groundwater to be contaminated with propylene glycol and to what extent it may enter the storm drain system and contribute to the occurrences of nuisance odor conditions. The plan must also identify potential remedies that may be implemented and include an implementation schedule should the investigation indicate that groundwater contaminated with propylene glycol contributes or is responsible for nuisance odor conditions in the outfalls and the receiving waters.

The permittee shall develop and implement a plan to document the occurrence and extent of iron-fixing and/or *Sphaerotilus* bacteria growths at all outfalls that receive discharges of deicing fluids and the downstream receiving waters. The permittee shall perform this investigation annually to determine to what extent the conditions have changed and make recommendations for additional controls and amendments to the SWPPP as necessary should nuisance growths continue to occur. This plan should consider the removal of existing bacteria growth from outfalls and documenting the conditions associated with observed bacteria growths in an effort to understand contributing factors and identify measures to eliminate or reduce bacteria growth.

- d. Pesticide Management. The permittee shall develop and implement BMPs for pesticide management with the goal of reducing or eliminating the concentrations and loads of pesticides in storm water discharges to the receiving waters. Mosquito control products shall be employed in accordance with State requirements by qualified personnel.
- e. Illicit Discharge Detection and Elimination. The permittee shall maintain and continue to implement and enforce a program to detect and eliminate illicit discharges or flows into the Airport's storm drainage system. The program established in the SWPPP shall continue to include the following:
- (1) The plan must effectively prohibit non-storm water discharges into the system that are not authorized under this permit or the SWPPP. The plan shall include consideration of policies, contractual agreements, or other mechanisms that include sanctions for non-compliance. Procedures shall include inspections, site visits, audits, and notification for referral to DEM for enforcement action.
 - (2) The allowable non-storm water discharges listed in Part I.A.6.c. of the Permit must be addressed if they are identified by the permittee or the Department as being significant contributors of pollutants.
 - (3) The SWPPP must contain procedures to identify and locate illicit discharges, the source of the discharge, remove illicit discharges, document actions, and evaluate impact on storm water drainage system subsequent to the removal.
 - (4) The permittee must inform employees, businesses, contractors, and

tenants of hazards associated with illegal discharges and improper waste disposal including, but not limited to, vehicle wash water and dry weather discharge of deicing chemicals.

- (5) An annual inspection of catch basins and manholes for illicit connections, investigation of complaints, and dry weather field screening for non-storm water flows and field tests of selected parameters as indicators of illicit discharge sources as follows:
- i. The permittee must keep records of all inspections and corrective actions required and completed.
 - ii. Implementation of procedures for dry weather surveys including field screening for non-storm water flows and field tests of selected parameters and bacteria. Dry weather surveys must be conducted no less than 72 hours after the last rain fall of 0.10 inches or more. At a minimum, all dry weather flows observed during the screening from outfalls must be collected and analyzed for temperature, conductivity, pH, propylene glycol and bacteria. It is recommended that flow measurements be conducted. In addition, visual observations must include but not be limited to the following: odors, sheen, stressed vegetation, coloration/staining, algae growth, sedimentation and/or scouring in the vicinity of the outfalls. If visual observations indicate the presence of illicit discharges additional sampling and analysis for any other parameters that may be useful in the identification of the illicit discharge must be performed as warranted. Dry weather survey results must be summarized in a table and include at a minimum, the following information: location (latitude/longitude), size and type of outfall (e.g. 15" diameter concrete pipe), flow (indicate if flowing or not, include flow rate if determined), sample results, results of other parameters if measured (e.g. temperature, conductivity, and pH), and sample analysis method (e.g. Standard Methods for the Examination of Water and Wastewater). The permittee must perform one (1) survey annually, to be conducted between October 1st – March 31st.
 - iii. Annually, the permittee shall provide a report certifying that all discharges have been inspected and tested for the presence of non-storm water discharges. If no flow is observed the report shall include the date of outfall inspection and a certification that no flow was observed. If flow is observed the report must include a description of the results of any test for the presence of non-storm water discharges, the methods used, and the date of any testing. The report shall include a plan and schedule for investigating and removing the source of non-storm water flows.
- (6) The Plan must include development and implementation of sanitary waste handling BMPs to reduce the potential that storm water runoff will come in contact with or become contaminated by sanitary wastes associated with handling sanitary wastes from airplanes.
- f. Post-Construction Storm Water Management in New Development and Redevelopment. The permittee shall develop and implement a program to address storm water runoff from new development and redevelopment projects. The plan must address direct discharges of storm water to waters of the State in addition to the discharges to the storm drainage system. The program must ensure that

controls are in place to prevent or minimize water quality impacts. The post-construction program must include:

- (1) Development and implementation of strategies which include a combination of structural methods such as detention basins, wet basins, infiltration basins and trenches, dry wells, galleys, vegetated swales and vegetated filter strips and/or non-structural BMPs.
 - (2) Procedures for site plan review to ensure that design of controls to address post-construction runoff are consistent with: The State of Rhode Island Storm Water Design and Installation Manual (as amended).
 - (3) Procedures to ensure adequate and long-term operation and maintenance of BMPs.
 - (4) Procedures to develop and implement strategies to reduce runoff volume which may include minimizing impervious areas such as roads, parking, paving or other surfaces, encouraging infiltration of non-contaminated runoff, preventing channelization, encouraging sheet flow, and where appropriate, preserving, enhancing or establishing buffers along surface water bodies and tributaries.
 - (5) Planned construction activities (such as terminal expansion or future pavement reconstruction/maintenance) to evaluate and if determined necessary for glycol containment, add additional drainage infrastructure to facilitate and/or enhance glycol-impacted storm water capture in the area(s) of construction.
- g. Drainage Master Plan. The Drainage Master Plan dated October, 2008 shall be amended to incorporate the Deicer Fluid Collection and Management system described in Part I.B.4.a.(1). The plan shall provide the permittee with a detailed plan of the existing drainage, topography, and land use which will also be used to assess existing conditions and storm water impacts as well as to determine the impact of future development at the facility.
- h. Water Quality Monitoring. The permittee shall conduct instream water quality monitoring in order to evaluate storm water impacts on the receiving water bodies of the outfalls of the Airport's storm water drainage system. The monitoring shall be conducted annually and be coordinated with an outfall monitoring event during the deicing season as specified in Part I.A.1., I.A.2., I.A.4, and I.A.5. This monitoring will assist in determining the Airport's compliance with state water quality standards. The water quality monitoring plan shall consist of the following conditions:
- (1) Water Quality Monitoring Events and Locations. Instream monitoring shall be conducted at the following four (4) receiving water locations: 1. The inlet to Warwick Pond at Lake Shore Drive; 2. The outlet to Warwick Pond; 3. Buckeye Brook at West Shore Road and; 4. Old Mill Creek at Tidewater Drive. The monitoring shall be conducted during a frozen precipitation event (i.e. snow, sleet, freezing rain) during the deicing season (October 1 – March 31) at the T.F. Green Airport while aircraft deicing is occurring. This monitoring shall be coordinated with storm water outfall sampling as specified in Part I.A.1., I.A.2., I.A.4, and I.A.5 of the permit.
 - (2) Monitoring Parameters, Frequency, and Duration. Water quality parameters monitored will include pH, temperature, conductivity, dissolved

oxygen (DO), running average DO saturation over a 24-hour period, BOD₅, COD, and propylene glycol. During the collection of samples a visual observation of the receiving waterbody shall be made to account for any discoloration and/or foaming and an observation to account for the presence of any nuisance odors. The frequency of monitoring will occur every four-(4) hours after the onset of the deicing event. The duration of the monitoring shall be approximately 48 hours after the onset of the storm event. The water quality monitoring schedule is summarized in the following table:

Station Type	Locations	Parameters	Approximate Frequency	Duration
Receiving Waters	Warwick Pond (Inlet) Warwick Pond (Outlet) Buckeye Brook (at West Shore Road) Old Mill Creek (at Tidewater Drive)	pH Temperature Conductivity DO DO saturation BOD ₅ COD Propylene Glycol	Every 4 hours	2 days

- i. Site Inspection. An annual site inspection must be conducted by appropriate personnel named in the SWPPP to verify that the description of potential pollutant sources is accurate, that the drainage map has been updated or otherwise modified to reflect current conditions, and controls to reduce pollutants in storm water discharges associated with industrial activity identified in the Plan are being implemented and are adequate. A tracking or follow up procedure must be used to ensure that the appropriate action has been taken in response to the inspection. Records documenting significant observations made during the site inspection must be retained as part of the SWPPP for a minimum of five (5) years.
- j. Consistency with Other Plans. Storm water management controls may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under Section 311 of the Clean Water Act or Best Management Practices (BMP) Programs otherwise required by a RIPDES permit and may incorporate any part of such plans into the SWPPP by reference.

C. DETECTION LIMITS

The permittee shall assure that all stormwater testing required by this permit, is performed in conformance with the method detection limits listed below (**the EPA method is noted for reference, other EPA approved methods found in 40 CFR Part 136 may be utilized**). **All sludge testing required by this permit shall be in conformance with the method detection limits found in 40 CFR 503.8.** In accordance with 40 CFR Part 136, EPA approved analysis

techniques, quality assurance procedures and quality control procedures shall be followed for all reports required to be submitted under the RIPDES program. These procedures are described in "Methods for the Determination of Metals in Environmental Samples" (EPA/600/4-91/010) and "Methods for Chemical Analysis of Water and Wastes" (EPA/600/4-79/020).

The report entitled "Methods for the Determination of Metals in Environmental Samples" includes a test which must be performed in order to determine if matrix interferences are present, and a series of tests to enable reporting of sample results when interferences are identified. Each step of the series of tests becomes increasingly complex, concluding with the complete Method of Standard Additions analysis. The analysis need not continue once a result which meets the applicable quality control requirements has been obtained. Documentation of all steps conducted to identify and account for matrix interferences shall be submitted along with the monitoring reports.

If, after conducting the complete Method of Standard Additions analysis, the laboratory is unable to determine a valid result, the laboratory shall report "could not be analyzed". Documentation supporting this claim shall be submitted along with the monitoring report. If valid analytical results are repeatedly unobtainable, DEM may require that the permittee determine a method detection limit (MDL) for their effluent or sludge as outlined in 40 CFR Part 136, Appendix B.

Therefore, all sample results shall be reported as: an actual value, "could not be analyzed", less than the reagent water MDL, or less than an effluent or sludge specific MDL. The effluent or sludge specific MDL must be calculated using the methods outlined in 40 CFR Part 136, Appendix B. Samples which have been diluted to ensure that the sample concentration will be within the linear dynamic range shall not be diluted to the extent that the analyte is not detected. If this should occur the analysis shall be repeated using a lower degree of dilution.

When calculating sample averages for reporting on discharge monitoring reports (DMRs):

1. "could not be analyzed" data shall be excluded, and shall not be considered as failure to comply with the permit sampling requirements;
2. results reported as less than the MDL shall be included as values equal to the MDL, and the average shall be reported as "less than" the calculated value.

For compliance purposes, DEM will replace all data reported as less than the MDL with zeroes, provided that DEM determines that all appropriate EPA approved methods were followed. If the re-calculated average exceeds the permit limitation it will be considered a violation.

LIST OF TOXIC POLLUTANTS

The following list of toxic pollutants has been designated pursuant to Section 307(a)(1) of the Clean Water Act. The Method Detection Limits (MDLs) represent the required Rhode Island MDLs.

(Updated: March 28, 2000)

Volatiles - EPA Method 624		MDL ug/l (ppb)	Pesticides - EPA Method 608		MDL ug/l (ppb)
1V	acrolein	10.0	17P	heptachlor epoxide	0.040
2V	acrylonitrile	5.0	18P	PCB-1242	0.289
3V	benzene	1.0	19P	PCB-1254	0.298
5V	bromoform	1.0	20P	PCB-1221	0.723
6V	carbon tetrachloride	1.0	21P	PCB-1232	0.387
7V	chlorobenzene	1.0	22P	PCB-1248	0.283
8V	chlorodibromomethane	1.0	23P	PCB-1260	0.222
9V	chloroethane	1.0	24P	PCB-1016	0.494
10V	2-chloroethylvinyl ether	5.0	25P	toxaphene	1.670
11V	chloroform	1.0			
12V	dichlorobromomethane	1.0	Base/Neutral - EPA Method 625		MDL ug/l (ppb)
14V	1,1-dichloroethane	1.0	1B	acenaphthene *	1.0
15V	1,2-dichloroethane	1.0	2B	acenaphthylene *	1.0
16V	1,1-dichloroethylene	1.0	3B	anthracene *	1.0
17V	1,2-dichloropropane	1.0	4B	benzidine	4.0
18V	1,3-dichloropropylene	1.0	5B	benzo(a)anthracene *	2.0
19V	ethylbenzene	1.0	6B	benzo(a)pyrene *	2.0
20V	methyl bromide	1.0	7B	3,4-benzofluoranthene *	1.0
21V	methyl chloride	1.0	8B	benzo(ghi)perylene *	2.0
22V	methylene chloride	1.0	9B	benzo(k)fluoranthene *	2.0
23V	1,1,2,2-tetrachloroethane	1.0	10B	bis(2-chloroethoxy)methane	2.0
24V	tetrachloroethylene	1.0	11B	bis(2-chloroethyl)ether	1.0
25V	toluene	1.0	12B	bis(2-chloroisopropyl)ether	1.0
26V	1,2-trans-dichloroethylene	1.0	13B	bis(2-ethylhexyl)phthalate	1.0
27V	1,1,1-trichloroethane	1.0	14B	4-bromophenyl phenyl ether	1.0
28V	1,1,2-trichloroethane	1.0	15B	butylbenzyl phthalate	1.0
29V	trichloroethylene	1.0	16B	2-chloronaphthalene	1.0
31V	vinyl chloride	1.0	17B	4-chlorophenyl phenyl ether	1.0
			18B	chrysene *	1.0
			19B	dibenzo (a,h)anthracene *	2.0
			20B	1,2-dichlorobenzene	1.0
			21B	1,3-dichlorobenzene	1.0
			22B	1,4-dichlorobenzene	1.0
			23B	3,3'-dichlorobenzidine	2.0
			24B	diethyl phthalate	1.0
			25B	dimethyl phthalate	1.0
			26B	di-n-butyl phthalate	1.0
			27B	2,4-dinitrotoluene	2.0
			28B	2,6-dinitrotoluene	2.0
			29B	di-n-octyl phthalate	1.0
			30B	1,2-diphenylhydrazine (as azobenzene)	1.0
			31B	fluoranthene *	1.0
			32B	fluorene *	1.0
			33B	hexachlorobenzene	1.0
			34B	hexachlorobutadiene	1.0
			35B	hexachlorocyclopentadiene	2.0
			36B	hexachloroethane	1.0
			37B	indeno(1,2,3-cd)pyrene *	2.0
			38B	isophorone	1.0
			39B	naphthalene *	1.0
			40B	nitrobenzene	1.0
			41B	N-nitrosodimethylamine	1.0
			42B	N-nitrosodi-n-propylamine	1.0
			43B	N-nitrosodiphenylamine	1.0
			44B	phenanthrene *	1.0
			45B	pyrene *	1.0
			46B	1,2,4-trichlorobenzene	1.0
Acid Compounds - EPA Method 625		MDL ug/l (ppb)			
1A	2-chlorophenol	1.0			
2A	2,4-dichlorophenol	1.0			
3A	2,4-dimethylphenol	1.0			
4A	4,6-dinitro-o-cresol	1.0			
5A	2,4-dinitrophenol	2.0			
6A	2-nitrophenol	1.0			
7A	4-nitrophenol	1.0			
8A	p-chloro-m-cresol	2.0			
9A	pentachlorophenol	1.0			
10A	phenol	1.0			
11A	2,4,6-trichlorophenol	1.0			
Pesticides - EPA Method 608		MDL ug/l (ppb)			
1P	aldrin	0.059			
2P	alpha-BHC	0.058			
3P	beta-BHC	0.043			
4P	gamma-BHC	0.048			
5P	delta-BHC	0.034			
6P	chlordane	0.211			
7P	4,4'-DDT	0.251			
8P	4,4'-DDE	0.049			
9P	4,4'-DDD	0.139			
10P	dieldrin	0.082			
11P	alpha-endosulfan	0.031			
12P	beta-endosulfan	0.036			
13P	endosulfan sulfate	0.109			
14P	endrin	0.050			
15P	endrin aldehyde	0.062			
16P	heptachlor	0.029			

OTHER TOXIC POLLUTANTS

Updated: March 28, 2000

	MDL ug/l (ppb)
Antimony, Total	5.0 - EPA Method 200.9
Arsenic, Total	5.0 - EPA Method 206.9
Beryllium, Total	0.2 - EPA Method 210.2 ¹
Cadmium, Total	1.0 - EPA Method 200.9
Chromium, Total	5.0 - Standard Methods 18 th Ed. 3113B
Chromium, Hexavalent ^{***}	20.0 - Standard Methods 16 th Ed., 312.B
Copper, Total	20.0 - EPA Method 200.7
Lead, Total	3.0 - EPA Method 200.9
Mercury, Total	0.5 - EPA Method 245.1
Nickel, Total	10.0 - EPA Method 200.7
Selenium, Total	5.0 - EPA Method 200.9
Silver, Total	1.0 - Standard Methods 18 th Ed. 3113B
Thallium, Total	5.0 - EPA Method 200.9
Zinc, Total	20.0 - EPA Method 200.7
Asbestos	**
Cyanide, Total	10.0 - EPA Method 335.4
Phenols, Total ^{***}	50.0 - EPA Method 420.2
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0 - EPA Method 524.2

* Polynuclear Aromatic Hydrocarbons

** No Rhode Island Department of Environmental Management (RIDEM) MDL

*** Not a priority pollutant as designated in the 1997 Water Quality Regulations (Table 5)

NOTE:

All MDLs have been established in accordance with the definition of "Detection Limits" in the RIDEM Water Quality Regulations for Water Pollution Control. Unless otherwise noted the MDLs have been determined in reagent water by the Rhode Island Department of Health, Division of Laboratories. The MDL for a given analyte may vary with the type of sample. MDLs which are determined in reagent water may be lower than those determined in wastewater due to fewer matrix interferences. Variability in instrument performance can also lead to inconsistencies in determinations of MDLs.

¹Method detection limits for these metals analyses were determined by the USEPA. They are not contrived values and should be obtainable with any satisfactory atomic absorption spectrophotometer. To insure valid data the analyst must analyze for matrix interference effects and if detected treat accordingly using either successive dilution matrix modification or method of Standard Additions (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

To help verify the absence of matrix or chemical interference the analyst is required to complete specific quality control procedures. For the metals analyses listed above the analyst must withdraw from the sample two equal aliquots; to one aliquot add a known amount of analyte, and then dilute both to the same volume and analyze. The unspiked aliquot multiplied by the dilution factor should be compared to the original. Agreement of the results within 10% indicates the absence of interference. Comparison of the actual signal from the spiked aliquot to the expected response from the analyte in an aqueous standard should help confirm the finding from the dilution analysis. (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

For Methods 624 and 625 the laboratory must on an ongoing basis, spike at least 5% of the samples from each sample site being monitored. For laboratories analyzing 1 to 20 samples per month, at least one spiked sample per month is required. The spike should be at the discharge permit limit or 1 to 5 times higher than the background concentration determined in Section 8.3.2, whichever concentration would be larger. (40 CFR Part 136 Appendix B Method 624 and 625 subparts 8.3.1 and 8.3.11).

D. MONITORING AND REPORTING

1. Monitoring

All monitoring required by this permit shall be done in accordance with sampling and analytical testing procedures specified in Federal Regulations (40 CFR Part 136).

2. Reporting

a. *Discharge Monitoring Report (DMR) Forms.* Monitoring results obtained during the previous quarter shall be summarized and reported on DMR Forms, postmarked no later than the 15th day of the month following the completed reporting period. A copy of the analytical laboratory report, specifying analytical methods used, shall be included with each report submission. Testing shall be reported as follows:

	<u>Quarter Testing To be performed</u>	<u>Report Due No later than</u>	<u>Results Submitted on DMR for</u>
First Quarter:	January 1– March 31	April 15	March
Second Quarter:	April 1– June 30	July 15	June
Third Quarter:	July 1– September 30	October 15	September
Fourth Quarter:	October 1–December 31	January 15	December

The first report is due on April 15, 2005.

b. *End of Season Deicing Summary and Management Report.* An annual report must be prepared which provides a summary and description of glycol usage, collection and management activities during the previous deicing season. Such report shall be submitted annually, no later than June 15 following the deicing season and must include, at a minimum, the following:

- i. Tabular summary of aircraft deicing fluid usage and collection volumes (daily log of volumes of glycol used by each tenant/entity, total glycol used and collected per day that deicing occurs, total glycol used and collected annually, annual % glycol collected, and % glycol collected per storm event);

- ii. Summary of overall seasonal weather conditions;
 - iii. A summary of all odor complaints received and any investigations and related amendments to the SWPPP and associated BMPs,
 - iv. Recommendations for usage and collection procedures, and equipment to improve collection efficiencies and overall program management, enhanced BMPs and recommendations to amend the SWPPP. This shall include an assessment of the applicability of source reduction BMPs such as anti-icing techniques and innovative technologies as well as an assessment of practices and procedures employed during the monitoring event to identify necessary improvements for the next deicing season. The recommendations must include a schedule to amend the SWPPP and implement enhanced BMPs subject to the Director's approval.
- c. *Wet Weather Deicing Event Specific Deicing Fluid Collection and Management Report.* For each wet weather event in which aircraft deicing occurs, an event specific report must be prepared. Such report(s) shall be submitted with the DMR Forms as specified in Part I.D, and must include, at a minimum, the following:
- i. Tabular summary of aircraft deicing fluid usage and collection volumes (daily log of volumes of glycol used by each tenant/entity, total glycol used and collected per day that deicing occurs, and % glycol collected per storm event. The report shall identify the amounts used and collected for the terminal and cargo areas and secondary deicing areas;
 - ii. Summary of climatic conditions that includes a discussion of types and timing of storms and resulting effect(s) on collection activities for each individual storm event;
 - iii. A daily log of collection efforts and glycol monitoring that includes the number of employees dedicated to GRV collection efforts, the times and amounts collected from each deicing area, times and locations of collection efforts at each deicing area, efforts made to collect runoff in a timely manner as soon as practical to the time of application and identification of any impediments to timely and efficient collection of concentrated runoff prior to dilution and observations and/or recommendations for improvements.
 - iv. A summary and event specific discussion of outfall and in-stream monitoring results for sampling events conducted under Part I.A.1 and Part I.B.4.h. and calibration sampling conducted under Part I.B.4.a.(1).viii.f ;
 - v. A summary of any odor complaints received during or subsequent to the deicing event and any associated investigations performed by RIAC;
 - vi. Recommendations for usage and collection procedures, equipment to improve collection efficiencies and overall program management, enhanced BMPs and recommendations to amend the SWPPP. This shall include an assessment of the applicability of source reduction BMPs such as anti-icing techniques and innovative technologies as well as an assessment of practices and procedures employed during the monitoring event to identify necessary improvements for the next wet weather deicing event. The permittee shall immediately amend the plan in accordance with Part I.B.3. and submit changes to the plan to the DEM within thirty (30) days of amending the plan.
- d. *Water Quality Monitoring Results.* All results obtained from the instream water quality monitoring in Part I.B.4.h. shall be summarized and reported in a water quality monitoring report postmarked no later than the 15th day of the third month following the end of the winter deicing season. The first report shall be due on

-
3. Signed copies of DMR Forms, and all other reports required herein, shall be submitted to:

Annie McFarland
Electronic Computer Operator
Office of Water Resources
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908

PART II
TABLE OF CONTENTS

GENERAL REQUIREMENTS

- (a) Duty to Comply
- (b) Duty to Reapply
- (c) Need to Halt or Reduce Not a Defense
- (d) Duty to Mitigate
- (e) Proper Operation and Maintenance
- (f) Permit Actions
- (g) Property Rights
- (h) Duty to Provide Information
- (i) Inspection and Entry
- (j) Monitoring and Records
- (k) Signatory Requirements
- (l) Reporting Requirements
- (m) Bypass
- (n) Upset
- (o) Change in Discharge
- (p) Removed Substances
- (q) Power Failures
- (r) Availability of Reports
- (s) State Laws
- (t) Other Laws
- (u) Severability
- (v) Reopener Clause
- (w) Confidentiality of Information
- (x) Best Management Practices
- (y) Right of Appeal

DEFINITIONS

GENERAL REQUIREMENTS

(a) Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Chapter 46-12 of the Rhode Island General Laws and the Clean Water Act (CWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

- (1) The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.
- (2) The CWA provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions implementing Sections 301, 302, 306, 307 or 308 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 of not more than 1 year, or both.
- (3) Chapter 46-12 of the Rhode Island General Laws provides that any person who violates a permit condition is subject to a civil penalty of not more than \$5,000 per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a criminal penalty of not more than \$10,000 per day of such violation and imprisonment for not more than 30 days, or both. Any person who knowingly makes any false statement in connection with the permit is subject to a criminal penalty of not more than \$5,000 for each instance of violation or by imprisonment for not more than 30 days, or both.

(b) Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The permittee shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director. (The Director shall not grant permission for applications to be submitted later than the expiration date of the existing permit.)

(c) Need to Halt or Reduce Not a Defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(d) Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

(e) Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures, and, where applicable, compliance with DEM "Rules and Regulations Pertaining to the Operation and Maintenance of Wastewater Treatment Facilities" and "Rules and Regulations Pertaining to the Disposal and Utilization of Wastewater Treatment Facility Sludge." This provision requires the operation of back-up or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of the permit.

(f) Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause, including but not limited to: (1) Violation of any terms or conditions of this permit; (2) Obtaining this permit by misrepresentation or failure to disclose all relevant facts; or (3) A change in any conditions that requires either a temporary or permanent reduction or elimination of the authorized discharge. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(g) Property Rights

This permit does not convey any property rights of any sort, or any exclusive privilege.

(h) 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.

(i) Inspection and Entry

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

- (1) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
- (2) Have access to and copy, at reasonable times any records that must be kept under the conditions of this permit;
- (3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and

- (4) Sample or monitor any substances or parameters at any location, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA or Rhode Island law.

(j) Monitoring and Records

- (1) Samples and measurements taken for the purpose of monitoring shall be representative of the volume and nature of the discharge over the sampling and reporting period.
- (2) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings from continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 5 years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.
- (3) Records of monitoring information shall include:
 - (i) The date, exact place, and time of sampling or measurements;
 - (ii) The individual(s) who performed the sampling or measurements;
 - (iii) The date(s) analyses were performed;
 - (iv) The individual(s) who performed the analyses;
 - (v) The analytical techniques or methods used; and
 - (vi) The results of such analyses.
- (4) Monitoring must be conducted according to test procedures approved under 40 CFR Part 136 and applicable Rhode Island regulations, unless other test procedures have been specified in this permit.
- (5) The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall upon conviction, be punished by a fine of not more than \$10,000 per violation or by imprisonment for not more than 6 months per violation or by both. Chapter 46-12 of the Rhode Island General Laws also provides that such acts are subject to a fine of not more than \$5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.
- (6) Monitoring results must be reported on a Discharge Monitoring Report (DMR).
- (7) If the permittee monitors any pollutant more frequently than required by the permit, using test procedures approved under 40 CFR Part 136, applicable State regulations, or as specified in the permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

(k) Signatory Requirement

All applications, reports, or information submitted to the Director shall be signed and certified in accordance with Rule 12 of the Rhode Island Pollutant Discharge Elimination System (RIPDES) Regulations. Rhode Island General Laws, Chapter 46-12 provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$5,000 per violation, or by imprisonment for not more than 30 days per violation, or by both.

(l) Reporting Requirements

- (1) Planned changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility.
- (2) Anticipated noncompliance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with the permit requirements.
- (3) Transfers. This permit is not transferable to any person except after written notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under State and Federal law.
- (4) Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.
- (5) Twenty-four hour reporting. The permittee shall immediately report any noncompliance which may endanger health or the environment by calling DEM at (401) 222-3961, (401) 222-6519 or (401) 222-2284 at night.

A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

The following information must be reported immediately:

- (i) Any unanticipated bypass which causes a violation of any effluent limitation in the permit; or
- (ii) Any upset which causes a violation of any effluent limitation in the permit; or
- (iii) Any violation of a maximum daily discharge limitation for any of the pollutants specifically listed by the Director in the permit.

The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

- (6) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (1), (2), and (5), of this section, at the time monitoring reports are submitted. The reports shall contain the information required in paragraph (1)(5) of the section.
- (7) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, they shall promptly submit such facts or information.

(m) Bypass

"Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

- (1) Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs (2) and (3) of this section.
- (2) Notice.
 - (i) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten (10) days before the date of the bypass.
 - (ii) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Rule 14.18 of the RIPDES Regulations.
- (3) Prohibition of bypass.
 - (i) Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
 - (A) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, where "severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production;
 - (B) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - (C) The permittee submitted notices as required under paragraph (2) of this section.

- (ii) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in paragraph (3)(i) of this section.

(n) Upset

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. 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.

- (1) Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of paragraph (2) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
- (2) Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - (a) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - (b) The permitted facility was at the time being properly operated;
 - (c) The permittee submitted notice of the upset as required in Rule 14.18 of the RIPDES Regulations; and
 - (d) The permittee complied with any remedial measures required under Rule 14.05 of the RIPDES Regulations.
- (3) Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

(o) Change in Discharge

All discharges authorized herein shall be consistent with the terms and conditions of this permit. Discharges which cause a violation of water quality standards are prohibited. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Any anticipated facility expansions, production increases, or process modifications which will result in new, different or increased discharges of pollutants must be reported by submission of a new NPDES application at least 180 days prior to commencement of such discharges, or if such changes will not violate the effluent limitations specified in this permit, by notice, in writing, to the Director of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by the permit constitutes a violation.

(p) Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner consistent with applicable Federal and State laws and regulations including, but not limited to the CWA and the Federal Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq., Rhode Island General Laws, Chapters 46-12, 23-19.1 and regulations promulgated thereunder.

(q) Power Failures

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

In accordance with the Schedule of Compliance contained in Part I, provide an alternative power source sufficient to operate the wastewater control facilities;

or if such alternative power source is not in existence, and no date for its implementation appears in Part I,

Halt reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

(r) Availability of Reports

Except for data determined to be confidential under paragraph (w) below, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the DEM, 291 Promenade Street, Providence, Rhode Island. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA and under Section 46-12-14 of the Rhode Island General Laws.

(s) State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law.

(t) Other Laws

The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, nor does it relieve the permittee of its obligation to comply with any other applicable Federal, State, and local laws and regulations.

(u) Severability

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

(v) Reopener Clause

The Director reserves the right to make appropriate revisions to this permit in order to incorporate any appropriate effluent limitations, schedules of compliance, or other provisions which may be authorized under the CWA or State law. In accordance with Rules 15 and 23 of the RIPDES Regulations, if any effluent standard or prohibition, or water quality standard is promulgated under the CWA or under State law which is more stringent than any limitation on the pollutant in the permit, or controls a pollutant not limited in the permit, then the Director may promptly reopen the permit and modify or revoke and reissue the permit to conform to the applicable standard.

(w) Confidentiality of Information

(1) Any information submitted to DEM pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, DEM may make the information available to the public without further notice.

(2) Claims of confidentiality for the following information will be denied:

- (i) The name and address of any permit applicant or permittee;
- (ii) Permit applications, permits and any attachments thereto; and
- (iii) NPDES effluent data.

(x) Best Management Practices

The permittee shall adopt Best Management Practices (BMP) to control or abate the discharge of toxic pollutants and hazardous substances associated with or ancillary to the industrial manufacturing or treatment process and the Director may request the submission of a BMP plan where the Director determines that a permittee's practices may contribute significant amounts of such pollutants to waters of the State.

(y) Right of Appeal

Within thirty (30) days of receipt of notice of a final permit decision, the permittee or any interested person may submit a request to the Director for an adjudicatory hearing to reconsider or contest that decision. The request for a hearing must conform to the requirements of Rule 49 of the RIPDES Regulations.

DEFINITIONS

1. For purposes of this permit, those definitions contained in the RIPDES Regulations and the Rhode Island Pretreatment Regulations shall apply.
2. The following abbreviations, when used, are defined below.

cu. M/day or M ³ /day	cubic meters per day
mg/l	milligrams per liter
ug/l	micrograms per liter
lbs/day	pounds per day
kg/day	kilograms per day
Temp. °C	temperature in degrees Centigrade
Temp. °F	temperature in degrees Fahrenheit
Turb.	turbidity measured by the Nephelometric Method (NTU)
TNFR or TSS	total nonfilterable residue or total suspended solids
DO	dissolved oxygen
BOD	five-day biochemical oxygen demand unless otherwise specified
TKN	total Kjeldahl nitrogen as nitrogen
Total N	total nitrogen
NH ₃ -N	ammonia nitrogen as nitrogen
Total P	total phosphorus
COD	chemical oxygen demand
TOC	total organic carbon
Surfactant	surface-active agent
pH	a measure of the hydrogen ion concentration
PCB	polychlorinated biphenyl
CFS	cubic feet per second
MGD	million gallons per day
Oil & Grease	Freon extractable material
Total Coliform	total coliform bacteria
Fecal Coliform	total fecal coliform bacteria
ml/l	milliliter(s) per liter
NO ₃ -N	nitrate nitrogen as nitrogen
NO ₂ -N	nitrite nitrogen as nitrogen
NO ₃ -NO ₂	combined nitrate and nitrite nitrogen as nitrogen
Cl ₂	total residual chlorine