

AGENCY OF NATURAL RESOURCES  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
WATERSHED MANAGEMENT DIVISION  
ONE NATIONAL LIFE DRIVE, MAIN BUILDING, 2<sup>nd</sup> FLOOR  
MONTPELIER VT 05620-3522

Permit No.: 3-1559  
PIN: EJ91-0002.09  
NPDES No.: VT0120037

**AMENDED**  
DISCHARGE PERMIT

In compliance with the provisions of the Vermont Water Pollution Control Act, as amended (10 V.S.A. chapter 47), the Vermont Water Pollution Control Permit Regulations as amended, and the federal Clean Water Act as amended (33 U.S.C. § 1251 *et. seq*)

International Business Machines  
8976 Wellington Road  
Manassas, VA 20109-3925

(hereinafter referred to as the "Permittee") is authorized, by the Secretary, Agency of Natural Resources, to discharge from a facility located at:

1000 River Road  
Essex Jct., VT

to the Winooski River, Class B at the point of discharge in accordance with effluent limitations, monitoring requirements, and other conditions set forth in Parts I, II, III hereof.

This permit shall become effective on date of signing.

This permit and the authorization to discharge shall expire on March 31, 2020.

State of Vermont  
Agency of Natural Resources

Emily Boedecker, Commissioner  
Department of Environmental Conservation

By: \_\_\_\_\_

Date: \_\_\_\_\_

**I. SPECIAL CONDITIONS**

**A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS**

- From the date of signing through March 31, 2020, the Permittee is authorized to discharge from outfall serial number S/N 001: treated contaminated groundwater from the “former Fire Training Area”. Such discharges shall be limited and monitored by the Permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow		14,400 gpd	Daily	Total Flow
Trichloroethylene	30 ug/l <sup>(1)</sup>		1 x month	Grab
Vinyl Chloride	2.4 ug/l <sup>(1)</sup>		1 x month	Grab
Total Dichloroethenes		monitor only ug/l	1 x month	Grab
pH		6.5 to 8.5 S.U.	1 x month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be collected after the treatment system, prior to the discharge entering the river.

<sup>(1)</sup> If sample results indicate that the effluent does not meet the specified limitation the Permittee shall collect an additional effluent sample within 7 days of receiving the sample results and analyze the sample for Trichloroethylene, Vinyl Chloride, and Total Dichloroethenes.

2. From the date of signing through March 31, 2020, the Permittee is authorized to discharge from outfall serial number S/N 002: contaminated groundwater after treatment via the “**Groundwater Treatment Facility 1**”. Such discharges shall be limited and monitored by the Permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow		<b>0.600 MGD</b>	Daily	Total Flow
Tetrachloroethylene	3.3 ug/l <sup>(1)</sup>		2 x month	Grab
Trichloroethylene	30 ug/l <sup>(1)</sup>		2 x month	Grab
Vinyl Chloride	2.4 ug/l <sup>(1)</sup>		2 x month	Grab
Total Dichloroethenes		monitor only ug/l	2 x month	Grab
Ethylbenzene		monitor only ug/l	2 x month	Grab
Total xylenes		monitor only ug/l	2 x month	Grab
pH		6.5 to 8.5 S.U.	2 x month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be collected prior to the discharge combining with stormwater in Storm Drain 2.

<sup>(1)</sup> If sample results indicate that the effluent does not meet the specified limitation the Permittee shall collect an additional effluent sample within 7 days of receiving the sample results and analyze the sample for Tetrachloroethylene, Trichloroethylene, Vinyl Chloride, and Total Dichloroethenes.

- a. This Condition shall supersede the effluent limitations and monitoring requirements specified in Condition I.A.2.c of Discharge Permit No. 3-1295 issued January 15, 2004.

3. From the date of signing through March 31, 2020, the Permittee is authorized to discharge from outfall serial number S/N 003: contaminated groundwater after treatment via the “Groundwater Treatment Facility 2”. Such discharges shall be limited and monitored by the Permittee as specified below:

Effluent Characteristic	Discharge Limitations		Monitoring Requirements	
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Flow		0.150 MGD	Daily	Total Flow
Tetrachloroethylene	3.3 ug/l <sup>(1)</sup>		2 x month	Grab
Trichloroethylene	30 ug/l <sup>(1)</sup>		2 x month	Grab
Vinyl Chloride	2.4 ug/l <sup>(1)</sup>		2 x month	Grab
Total Dichloroethenes		monitor only ug/l	2 x month	Grab
Ethylbenzene		monitor only ug/l	2 x month	Grab
Total xylenes		monitor only ug/l	2 x month	Grab
pH		6.5 to 8.5 S.U.	2 x month	Grab

Samples taken in compliance with the monitoring requirements specified above shall be collected prior to the discharge combining with stormwater in Storm Drain 11.

<sup>(1)</sup> If sample results indicate that the effluent does not meet the specified limitation the Permittee shall collect an additional effluent sample within 7 days of receiving the sample results and analyze the sample for Tetrachloroethylene, Trichloroethylene, Vinyl Chloride, and Total Dichloroethenes.

4. **Influent Monitoring**

The permittee shall monitor the influent to the treatment systems for the parameters listed in Conditions I.A.1., 2. and 3. above, excluding flow, above at a minimum frequency of once per month.

5. **Special Conditions**

- a. The permittee shall notify the Agency (Wastewater Management Program), in writing, at least 5 days prior to initiating the discharge from outfall S/N 001.
- b. The permittee shall replace the carbon adsorption canisters prior to breakthrough of dissolved hydrocarbons into the final effluent. The time of breakthrough shall be calculated based on flow data developed from operational tests, analysis of untreated contaminated groundwater, analysis of contaminate concentrations within the treatment systems, and analysis of the final effluent. The calculated breakthrough time shall be utilized as a schedule for replacing and rotating the carbon adsorption units unless ongoing analyses demonstrate that a different breakthrough time interval is appropriate in order to meet the effluent limitations specified in Part I.A.1., 2., and 3. above. The dates of carbon canister replacement shall be reported on form WR-43.

- c. Should these discharges exceed the effluent limitations specified in Part I.A.1., **2., or 3.** above at any time, then permittee shall:
1. Notify the Wastewater Management Program within 24 hours;
  2. Submit a written report within 5 days detailing the reason(s) for the violation and the procedures to be employed so that the discharge will once again be in compliance with the effluent limitations; and
  3. The Wastewater Management Program will evaluate the situation on a case-by- case basis and may require the Permittee to cease discharging until such time as treatment has been restored to a level that will consistently meet the effluent limitations.
- d. These discharges shall not cause erosion or contain sediment which causes or contributes to a violation of water quality standards of the receiving water.
- e. These discharges shall not contain a visible sheen, foam, or floating solids at any time.
- f. These discharges shall not cause a visible discoloration of the receiving water.
- g. These discharges shall not cause or contribute to a violation of water quality standards of the receiving water.

## **B. REAPPLICATION**

If the permittee desires to continue to discharge after the expiration date of this permit, he shall apply on the application forms then in use at least 180 days before the permit expires.

Reapply for a Discharge Permit by **September 30, 2019.**

## **C. OPERATING FEES**

This discharge is subject to operating fees as required by 3 V.S.A. § 2822.

## **D. MONITORING AND REPORTING**

### **1. Sampling and Analysis**

The sampling, preservation, handling, and analytical methods used shall conform to the test procedures published in the 40 C.F.R. Part 136.

Samples shall be representative of the volume and quality of effluent discharged over the sampling and reporting period. All samples are to be taken during normal operating hours. The Permittee shall identify the effluent sampling location used for each discharge.

### **2. Reporting**

The Permittee is required to submit monitoring results as specified on a Discharge Monitoring Report form WR-43 (WR-43) or other reporting form approved by the Secretary. Reports are due on the 15th day of each month, beginning with the month following the effective date of this permit.

If, in any reporting period, there has been no discharge, the Permittee must submit that information by the report due date.

Signed copies of these, and all other reports required herein, shall be submitted to the Secretary at the following address:

Agency of Natural Resources  
Department of Environmental Conservation  
Watershed Management Division  
One National Life Drive, Main Building, 2<sup>nd</sup> Floor  
Montpelier VT 05620-3522

All reports shall be signed:

- a. In the case of corporations, by a principal executive officer of at least the level of vice president, or his/her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge described in the permit form originates and the authorization is made in writing and submitted to the Secretary;
- b. In the case of a partnership, by a general partner;
- c. In the case of a sole proprietorship, by the proprietor;
- d. In the case of a municipal, State, or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

### **3. Recording of Results**

The Permittee shall maintain records of all information resulting from any monitoring activities required including:

- a. The exact place, date, and time of sampling or measurements;
- b. The individual(s) who perform the sampling or measurements;
- c. The dates and times the analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques and methods used including sample collection handling and preservation techniques;
- f. The results of such analyses.
- g. The records of monitoring activities and results, including all instrumentation and calibration and maintenance records;
- h. The original calculation and data bench sheets of the operator who performed analysis of the influent or effluent pursuant to requirements of Section I.A. of this permit.

The results of monitoring requirements shall be reported (in the units specified) on the Vermont reporting form WR-43 or other forms approved by the Secretary.

### **4. Additional Monitoring**

If the Permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results

of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report form WR-43. Such increased frequency shall also be indicated.

## PART II

### A. MANAGEMENT REQUIREMENTS

#### 1. Facility Modification / Change in Discharge:

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant more frequently than, or at a level in excess of, that identified and authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such a violation may result in the imposition of civil and/or criminal penalties pursuant to 10 V.S.A. chapters 47, 201, and/or 211. Any anticipated facility alterations or expansions or process modifications which will result in new, different, or increased discharges of any pollutants must be reported by submission of a new permit application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the Secretary of such changes. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

#### 2. Noncompliance Notification

The Permittee shall give advance notice to the Secretary of any planned changes in the facility or activity which may result in noncompliance with permit requirements.

In the event the permittee is unable to comply with any of the conditions of this permit due, among other reasons, to:

- a. breakdown or maintenance of waste treatment equipment (biological and physical- chemical systems including, all pipes, transfer pumps, compressors, collection ponds or tanks for the segregation of treated or untreated wastes, ion exchange columns, or carbon absorption units),
- b. accidents caused by human error or negligence, or
- c. any unanticipated bypass or upset which exceeds any effluent limitation in the permit;
- d. violation of a maximum day discharge limitation for any of the pollutants listed by the Secretary in this permit; or
- e. other causes such as acts of nature,

the Permittee shall notify the Secretary within 24 hours of becoming aware of such condition or by the next business day and shall provide the Secretary with the following information, in writing, within five days:

- i. cause of non-compliance
- ii. a description of the non-complying discharge including its impact upon the receiving water;

- iii. anticipated time the condition of non-compliance is expected to continue or, if such condition has been corrected, the duration of the period of non-compliance;
- iv. steps taken by the Permittee to reduce and eliminate the non-complying discharge; and
- v. steps to be taken by the Permittee to prevent recurrence of the condition of non-compliance.

### **3. Operation and Maintenance**

All waste collection, control, treatment, and disposal facilities shall be operated in a manner consistent with the following:

- a. The Permittee shall, at all times, maintain in good working order and operate as efficiently as possible all treatment and control facilities and systems (and related appurtenances) installed or used by the Permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the Permittee only when the operation is necessary to achieve compliance with the conditions of this permit.
- b. The Permittee shall provide an adequate operating staff which is duly qualified to carry out the operation, maintenance, and testing functions required to insure compliance with the conditions of this permit; and
- c. The operation and maintenance of this facility shall be performed only by qualified personnel. The personnel shall be certified as required under the Vermont Wastewater Treatment Facility Operator Certification Rule.

### **4. Quality Control**

The Permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at regular intervals to ensure accuracy of measurements, or shall ensure that both activities will be conducted.

The Permittee shall keep records of these activities and shall provide such records upon request of the Secretary.

The Permittee shall analyze any additional samples as may be required by the Secretary to ensure analytical quality control.

### **5. Bypass**

The bypass of facilities (including pump stations) is prohibited, except where authorized under the terms and conditions of an Emergency Pollution Permit issued pursuant to 10 V.S.A. § 1268. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the activity in order to maintain compliance with the conditions of this permit.



## **6. Duty to Mitigate**

The Permittee shall take all reasonable steps to minimize or prevent any adverse impact to waters of the State resulting from non-compliance with any condition specified in this permit, including accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge.

## **7. Records Retention**

All records and information resulting from the monitoring activities required by this permit including all records of analyses performed, all calibration and maintenance of instrumentation records and all original chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit shall be retained for a minimum of three years, and shall be submitted to the Secretary upon request. This period shall be extended during the course of unresolved litigation regarding the discharge of pollutants or when requested by the Secretary.

## **8. Solids Management**

Collected screenings, sludges, and other solids removed in the course of treatment and control of wastewaters shall be stored, treated and disposed of in accordance with 10 V.S.A. chapter 159 and with the terms and conditions of any certification, interim or final, transitional operation authorization or order issued pursuant to 10 V.S.A. chapter 159 that is in effect on the effective date of this permit or is issued during the term of this permit.

## **9. Emergency Pollution Permits**

Maintenance activities or emergencies resulting from equipment failure or malfunction, including power outages, which result in an effluent which exceeds the effluent limitations specified herein, shall be considered a violation of the conditions of this permit, unless the Permittee immediately applies for, and obtains, an emergency pollution permit under the provisions of 10 V.S.A., § 1268. The Permittee shall notify the Secretary of the emergency situation by the next working day.

10 V.S.A. § 1268 reads as follows:

“When a discharge permit holder finds that pollution abatement facilities require repairs, replacement or other corrective action in order for them to continue to meet standards specified in the permit, he may apply in the manner specified by the secretary for an emergency pollution permit for a term sufficient to effect repairs, replacements or other corrective action. The permit may be issued without prior public notice if the nature of the emergency will not provide sufficient time to give notice; provided that the secretary shall give public notice as soon as possible but in any event no later than five days after the effective date of the emergency pollution permit. No emergency pollution permit shall be issued unless the applicant certifies and the secretary finds that:

- (1) there is no present, reasonable alternative means of disposing of the waste other than by discharging it into the waters of the state during the limited period of time of the emergency;
- (2) the denial of an emergency pollution permit would work an extreme hardship upon the applicant;
- (3) the granting of an emergency pollution permit will result in some public benefit;

- (4) the discharge will not be unreasonably harmful to the quality of the receiving waters;
- (5) the cause or reason for the emergency is not due to willful or intended acts or omissions of the applicant.”

Application shall be made to the Secretary of Natural Resources, Department of Environmental Conservation, One National Life Drive, Main Building, 2<sup>nd</sup> Floor, Montpelier VT 05620-3522.

## 10. Power Failure

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

- a. Provide an alternative power source sufficient to operate the wastewater control facilities, or if such alternative power source is not in existence,
- b. 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.

## B. RESPONSIBILITIES

### 1. Right of Entry

The Permittee shall allow the Secretary or authorized representative, upon the presentation of proper credentials:

- a. to 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;
- b. to have access to and copy, at reasonable times, any records required to be kept under the terms and conditions of this permit;
- c. to inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- d. to sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

### 2. Transfer of Ownership or Control

This permit is not transferable without prior written approval of the Secretary. All application and operating fees must be paid in full prior to transfer of this permit. In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the Permittee shall provide a copy of this permit to the succeeding owner or controller and shall send written notification of the change in ownership or control to the Secretary **at least 30 days in advance of the proposed transfer date**. The notice to the Secretary shall include a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage and liability between them. The Permittee shall

also inform the prospective owner or operator of their responsibility to make an application for transfer of this permit

This request for transfer application must include as a minimum:

- a. A properly completed application form provided by the Secretary and the applicable processing fee.
- b. A written statement from the prospective owner or operator certifying:
  - i.. The conditions of the operation that contribute to, or affect, the discharge will not be materially different under the new ownership.
  - ii. The prospective owner or operator has read and is familiar with the terms of the permit and agrees to comply with all terms and conditions of the permit.
  - iii. The prospective owner or operator has adequate funding to operate and maintain the treatment system and remain in compliance with the terms and conditions of the permit.
- c. The date of the sale or transfer.

The Secretary may require additional information dependent upon the current status of the facility operation, maintenance, and permit compliance.

### **3. Confidentiality**

Pursuant to 10 V.S.A. § 1259(b):

“Any records, reports or information obtained under this permit program shall be available to the public for inspection and copying. However, upon a showing satisfactory to the secretary that any records, reports or information or part thereof, other than effluent data, would, if made public, divulge methods or processes entitled to protection as trade secrets, the secretary shall treat and protect those records, reports or information as confidential. Any records, reports or information accorded confidential treatment will be disclosed to authorized representatives of the state and the United States when relevant to any proceedings under this chapter.”

Claims for confidentiality for the following information will be denied:

- a. The name and address of any permit applicant or permittee;
- b. Permit applications, permits, and effluent data; and
- c. Information required by application forms, including information submitted on the forms themselves and any attachments used to supply information required by the forms.

### **4. Permit Modification, Suspension, and Revocation**

After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term for cause including the following:

- a. violation of any terms or conditions of this permit;
- b. obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
- c. a change in any condition that requires either a temporary or permanent reduction or elimination of the permitted 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 shall not stay any permit condition.

The Permittee shall provide to the Secretary, within a reasonable time, any information which the Secretary 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 Secretary upon request, copies of records required to be kept by this permit.

#### **5. Toxic Effluent Standards**

If a toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under section 307(a) of the Clean Water Act for a toxic pollutant which is present in the Permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in this permit, then this permit shall be modified or revoked and reissued in accordance with the toxic effluent standard or prohibition and the Permittee so notified

#### **6. Oil and Hazardous Substance Liability**

Nothing in this permit shall be construed to preclude the institution of legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under 10 V.S.A. § 1281.

#### **7. Civil and Criminal Liability**

Except as provided in, "Bypass" (Section II.A.5.), "Power Failure" (Section II.A.10.), and "Emergency Pollution Permits" (Section II.A.9.), nothing in this permit shall be construed to relieve the Permittee from civil or criminal penalties for noncompliance. Civil and criminal penalties for non-compliance are provided for in 10 V.S.A. Chapters 47, 201 and 211.

#### **8. 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 or regulation.

#### **9. Property Rights**

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

**10. Other Information**

If 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 Secretary, it shall promptly submit such facts or information.

**11. 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.

**12. Authority**

This permit is issued under authority of 10 V.S.A. §§ 1258 and 1259 of the Vermont Water Pollution Control Act, the Vermont Water Pollution Control Permit Regulation, and Section 402 of the Clean Water Act, as amended.

**III. ADDITIONAL CONDITIONS**

**A. OTHER REQUIREMENTS**

This permit shall be modified, suspended or revoked to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b) (2) (C), and (D), 304(b) (2), and 307 (a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
2. Controls any pollutant not limited in the permit.

The permit as modified under this paragraph shall also contain any other requirements of the Vermont Water Pollution Control Act then applicable.

**B. DEFINITIONS**

For purposes of this permit, the following definitions shall apply:

**Agency** – The Agency of Natural Resources

**Annual Average** - The highest allowable average of daily discharges calculated as the sum of all daily discharges (mg/l, lbs or gallons) measured during a calendar year divided by the number of daily discharges measured during that year.

**Average** - The arithmetic means of values taken at the frequency required for each parameter over the specified period.

**Bypass** – The intentional diversion of waste streams from any portion of a treatment facility.

**The Clean Water Act** - The federal Clean Water Act, as amended.

**Composite Sample** - A sample consisting of a minimum of one grab sample per hour collected during a 24-hour period (or lesser period as specified in the section on Monitoring and Reporting) and combined proportionally to flow over that same time period.

**Daily Discharge** - The discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling.

For pollutants with limitation expressed in pounds the daily discharge is calculated as the total pounds of pollutants discharged over the day.

For pollutants with limitations expressed in mg/l the daily discharge is calculated as the average measurement of the pollutant over the day.

**Department** – The Vermont Department of Environmental Conservation.

**Discharge** – Any wastes, directly or indirectly, that are placed, deposited or emitted into waters of the state.

**Grab Sample** - An individual sample collected in a period of less than 15 minutes.

**Incompatible Substance** - Any waste being discharged into the treatment works which interferes with, passes through without treatment, or is otherwise incompatible with said works or would have a substantial adverse effect on the works or on water quality. This includes all pollutants required to be regulated under the Clean Water Act.

**Instantaneous Maximum** - A value not to be exceeded in any grab sample.

**Major Contributing Industry** - One that: (1) has a flow of 50,000 gallons or more per average work day; (2) has a flow greater than five percent of the flow carried by the municipal system receiving the waste; (3) has in its wastes a toxic pollutant in toxic amounts as defined in standards issued under Section 307(a) of the Act; or (4) has a significant impact, either singly or in combination with other contributing industries, on a publicly owned treatment works or on the quality of effluent from that treatment works.

**Maximum Day** (maximum daily discharge limitation) - The highest allowable "daily discharge" (mg/l, lbs, or gallons).

**Mean** - The mean value is the arithmetic mean.

**Monthly Average** - (Average monthly discharge limitation) - The highest allowable average of daily discharges (mg/l, lbs, or gallons) over a calendar month, calculated as the sum of all daily discharges (mg/l, lbs, or gallons) measured during a calendar month divided by the number of daily discharges measured during that month.

**NPDES** - The National Pollutant Discharge Elimination System.

**Secretary** - The Secretary of the Agency of Natural Resources

**State Certifying Agency** Agency of Natural Resources  
Department of Environmental Conservation  
Watershed Management Division  
One National Life Drive, Main Building, 2<sup>nd</sup> Floor  
Montpelier VT 05620-3522

**Waste** – Effluent, sewage or any substance or material, liquid, gaseous, solid or radioactive, including heated liquids, whether or not harmful or deleterious to waters.

**Weekly Average** - (Average weekly discharge limitation) - The highest allowable average of daily discharges (mg/l, lbs or gallons) over a calendar week, calculated as the sum of all daily discharges (mg/l, lbs or gallons) measured during a calendar week divided by the number of daily discharges measured during that week.

AGENCY OF NATURAL RESOURCES  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
1 NATIONAL LIFE DRIVE  
BUILDING MAIN-2  
MONTPELIER, VERMONT 05620-3522

AMENDED FACT SHEET

May 2017

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT  
TO DISCHARGE TO WATERS OF THE UNITED STATES

FILE NO.: 04-06

NPDES NO.: VT0120037 PERMIT

NO.: 3-1559

NAME AND ADDRESS OF APPLICANT:

International Business Machines Corporation  
8976 Wellington Road  
Manassas, VA 20109-3925

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

1000 River Road  
Essex Junction, Vermont

RECEIVING WATER: Winooski River, Class B with a waste management zone. Class B waters are suitable for swimming and other forms of water based recreation, irrigation of crops and other agricultural uses without treatment; good aesthetic value; aquatic biota and wildlife sustained by high quality aquatic habitat; and acceptable for public water supply with filtration and disinfection. A waste management zone is a specific reach of Class B waters designated by a permit to accept the discharge of properly treated wastes that prior to treatment contained organisms pathogenic to human beings.

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

The Secretary of the Vermont Agency of Natural Resources (Secretary) received an application to amend the discharge permit from the above-named applicant on April 25, 2017. The applicant operates groundwater remediation systems located within an industrial complex facility that is engaged in the manufacture of semiconductors. The applicant is requesting authorization to decrease the flow limitation for existing outfall S/N 002 and to add new outfall S/N 003 for the discharge of treated groundwater from new remediation systems. At this time the Secretary has made a tentative decision to amend the discharge permit for these remediation activities. The discharges are from the applicant's groundwater remediation systems to the Winooski River. A map of the outfall locations is attached to this Fact Sheet as Attachment A.



## II. Description of Discharge

A quantitative description of the discharge in terms of significant effluent parameters is based upon state and federal laws and regulations and upon self-monitoring data.

## III. Limitations and Conditions

The effluent limitations and sampling frequencies included in this draft permit may be found on pages 2, 3, and 4.

## IV. **Permit Basis and Explanation of Effluent Limitation Derivation**

International Business Machines (IBM) owns and operates a semiconductor manufacturing facility in Essex Junction, VT. IBM began operations at this facility in the 1960s and the discharges from the facility are currently authorized under the terms and conditions of Discharge Permit No. 3-1295. Due to past chemical and waste handling at the site, the groundwater has been contaminated. To remediate this problem, IBM has been extracting, collecting, and treating the contaminated groundwater. Currently Global Foundries U.S. Inc. (Global) is in the process of purchasing this manufacturing site. It is expected that the sale of the site will be completed in May 2015. Per the conditions of the sale, IBM will continue to operate groundwater remediation systems at the facility. Global will be responsible for the other discharges authorized by Discharge Permit No. 3-1295. **The sale was finalized in June 2015.**

### **Receiving Water**

The Winooski River downstream of the IBM discharge is a Class B water, with a waste management zone. It is classified as a warm water fishery from June 1st through September 30th. Summer 7Q10 flow is 167 cfs. Winter 7Q10 flow is 346 cfs. Low median monthly summer flow is 473 cfs.

There are no permitted direct discharges within 10 miles upstream of the IBM discharge.

### **Discharge Point S/N 001 (Fire Training Area)**

This area was formerly used for fire training exercises from the 1960s through the mid-1980s. Petroleum products and organic solvents were burned in unlined pits. The contaminated groundwater is collected from a drainage system associated with a contaminated soil staging pad and from recovery wells. The contaminated water is then pump through two sediment filters in series for particulate removal then through two carbon canisters in series for contaminate removal;the treated water then enters an equalization tank. This system was constructed in 1993. After treatment this discharge is currently conveyed to the Industrial Wastewater Treatment Facility (IWWTF) and comingles with treated process wastewaters and is discharged to the Winooski River. Upon transfer of the site to Global, IBM will no longer have authorization to convey this wastestream to the IWWTF and has requested authorization to discharge this treated groundwater directly to the Winooski River.

### Flow

The draft permit contains a 14,400 gpd limitation for flow. This effluent limitation is based on the maximum capacity of the recovery wells and the design of the treatment system. While this system is designed to be a continuous discharge the volume of the discharge will vary based on season due to the elevation of the groundwater table and surface water infiltration. Typically, the discharge from this remediation system averages approximately 1,000 gpd.

### Trichloroethylene

Trichloroethylene has been routinely detected in groundwater at this area of the site. The draft permit establishes a monthly average trichloroethylene effluent limitation of 30 ug/l. This limitation was based upon the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on the design of the treatment system and past effluent monitoring data, this effluent limitation can be reliably met. Sampling is required once per month.

### Vinyl chloride

Vinyl chloride has been routinely detected in the groundwater at this area of the site and can be a breakdown product of trichloroethylene. The draft permit establishes a monthly average vinyl chloride effluent limitation of 2.4 ug/l. This limitation was based upon the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on the design of the treatment system and past effluent monitoring data, this effluent limitation can be reliably met. Sampling is required once per month.

### Total Dichloroethenes

Various forms of dichloroethenes have been detected in the groundwater at this area of the site and can result from the breakdown of trichloroethylene. Appendix C of the Vermont Water Quality Standards does not contain any criteria for Total Dichloroethenes. Therefore a "monitor only" requirement for Total Dichloroethenes has been included in this permit. Sampling is required once per month.

### pH

The permit establishes a pH limitation of 6.5 - 8.5 Standard Units. This limitation is based on the Vermont Water Quality Standards. Sampling is once per month

### Anti-Degradation

This discharge is the result of site remediation activities design to control and remove contaminated groundwater from a listed hazardous waste site. Per Section III.C.1 of the Agency's "Interim Anti-Degradation Implementation Procedure" dated October 12, 2010, this discharge does not trigger the Anti-Degradation requirements of the Vermont Water Quality Standards and the Agency's Procedure.

### Discharge Criteria

Per Section 1-04.A of the Vermont Water Quality Standards, new discharges of wastes may be allowed only when all the following criteria are met:

1. The proposed discharge is in conformance with all applicable provisions of these rules including classification of the receiving waters adopted by the Board as set forth in Chapter 4 of these rules.

2. There is neither an alternative method of waste disposal, nor an alternative location for waste disposal, that would have a lesser impact on water quality including the quality of groundwater, or if there is such an alternative method or location, it would clearly be unreasonable to require its use.
3. The design and operation of any waste treatment or disposal facility is adequate and sufficiently reliable to ensure the full support of uses and to ensure compliance with these rules and with all applicable state and federal treatment requirements and effluent limitations.
4. Except as provided for in 10 V.S.A. 1259(d) and (f), the discharge of wastes other than nonpolluting wastes and stormwater is prohibited in Class A waters regardless of the degree of treatment provided.
5. Except as provided for in 10 V.S.A. 1259, the discharge of wastes that, prior to treatment, contained organisms pathogenic to human beings is prohibited.
6. The receiving waters will have sufficient assimilative capacity to accommodate the proposed discharge.
7. Assimilative capacity has been allocated to the proposed discharge consistent with the classification set forth in Chapter 4 of these rules.
8. The discharge of wastes to the thermocline or hypolimnion of any lake in a manner that may prevent full support of uses is prohibited.
9. The discharge of sewage into Class B waters shall not pose more than a negligible risk public health. Compliance with this criterion shall include as assessment of both the level and reliability of treatment achieved and the impact of the discharge on the water quality of the receiving waters.

The Agency finds that these criteria have been met. Specifically,

1. This discharge conforms with the classification of the receiving water.
2. Currently this discharge, after treatment, is conveyed to the IWWTF and comingles with the treated process wastewaters from manufacturing operations and is discharged to the Winooski River. Global will be assuming ownership and operation of the IWWTF and has indicated that IBM will no longer be authorized to discharge this wastestream into the IWWTF. Due to the geologic formations and site limitations, infiltration or spray irrigation is not a feasible alternative for disposal of this wastewater nor, due to excessive cost, is it reasonable to construct a pipe system to convey this wastestream to the Central Groundwater Treatment System. In addition this site is not within the area served by the Essex Junction WWTF. Therefore, the only reasonable alternative is to discharge this wastewater to waters of the State.
3. Based on the current design of the treatment system and the permitted effluent limitations, the pollutants in this discharge will meet the Vermont Water Quality Standards and will not result in any measurable change in the receiving water and will ensure full support of all uses.
4. The discharge is not to a Class A water.
5. The discharge does not contain organisms pathogenic to humans.
6. Adequate assimilative capacity exists to accommodate this discharge. The instream Water Quality criteria of Appendix C of the Vermont Water Quality Standards are being implemented as the effluent limitations which will not result in a measurable change in the water quality of the receiving water.

7. See 6 above.
8. The receiving water for the discharge is the Winooski River and is not to the thermocline or hypolimnion portion of a lake.
9. The discharge does not contain sewage.

#### **Discharge Point S/N 002 (Central Groundwater Treatment System)**

This system collects contaminated groundwater from various production and shallow water wells throughout the site. The system also receives contaminated wastewater from air pollution control equipment and solvent recovery systems. The treatment system consists of ozone injection, peroxide injection, and carbon vessels. The treated water is then discharged to the Winooski River via "Storm Drain 2" which also conveys Reverse Osmosis (R.O.) reject water and stormwater to the river. Per Section 1-01.b of the Vermont Water Quality Standards, this is an "Existing Discharge". The current treatment system has been in operation since the late 1980s and was previously regulated under the terms and conditions of Discharge Permit No. 3-1295. This treatment system will continue to be operated by IBM after Global purchases the site and will be regulated by the terms and conditions of this permit. **Groundwater Treatment Facility 1 is a new facility being constructed to replace the existing Central Groundwater Treatment System. The new facility will not receive contaminated wastewater from air pollution control equipment and solvent recovery systems. The treatment system consists of an air stripper, a carbon adsorption unit, and a resin unit to remove contaminants. The treated groundwater will be discharged to the Winooski River via "Storm Drain 2" which also conveys stormwater to the river.**

#### Flow

The flow limitation for the Central Groundwater Treatment System remains at 0.750 mgd, maximum day, and is unchanged from the permit that currently authorizes this discharge. This limitation is based on the treatment system's design flow. This is a continuous discharge. **The amended flow limitation for the Groundwater Treatment Facility 1 is proposed at 0.600 MGD, maximum day. This reduction will offset the proposed flow limitation of 0.150 MGD for new outfall S/N 003 for Groundwater Treatment Facility 2.**

#### Tetrachloroethylene

Tetrachloroethylene is present in groundwater extracted at the site. The draft permit contains a monthly average tetrachloroethylene effluent limitation of 3.3 ug/l. This limitation is based on the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on past effluent monitoring data and the design of the treatment system, this effluent limitation can be reliably met. Sampling is required twice per month.

#### Trichloroethylene

Trichloroethylene is present in groundwater extracted at the site. The draft permit contains a monthly average trichloroethylene effluent limitation of 30 ug/l. This limitation is based upon the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on past effluent monitoring data and the design of the treatment system, this effluent limitation can be reliably met. Sampling is required twice per month.

Vinyl chloride

Vinyl chloride results from the breakdown of trichloroethylene and tetrachloroethylene and is present in the contaminated groundwater. The draft permit contains a monthly average vinyl chloride effluent limitation of 2.4 ug/1. This limitation is based upon the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on past effluent monitoring data and the design of the treatment system, this effluent limitation can be reliably met. Sampling is required twice per month.

Total Dichloroethenes, Ethylbenzene and xylene

Dichloroethenes result from the breakdown of trichloroethylene and tetrachloroethylene and various forms of dichloroethenes are present in groundwater at the site. Appendix C of the Vermont Water Quality Standards does not contain any criteria for Total Dichloroethenes. Therefore a "monitor only" requirement for Total Dichloroethenes has been included in this permit. Sampling is required twice per month.

Ethylbenzene and xylene have been detected in the extracted groundwater in low concentrations. Therefore a "monitor only" requirement with sampling once per quarter was established in the permit that currently authorizes this discharge to confirm the proper operation of the treatment system. This permit proposes to maintain these monitoring and sampling requirements.

pH

The permit establishes a pH limitation of 6.5 - 8.5 Standard Units. This limitation is based on the Vermont Water Quality Standards. Sampling is required twice per month.

**Discharge Point S/N 003 (Groundwater Treatment Facility 2) – new outfall**

This system collects contaminated groundwater from various shallow water wells throughout the site. Groundwater Treatment Facility 2 is a new facility that is being constructed. The treatment system consists of an air stripper, a carbon adsorption unit, and a resin unit to remove contaminants. The treated groundwater will be discharged to the Winooski River via "Storm Drain 11" which also conveys stormwater to the river. Proposed outfall S/N 003 is approximately 1,030 feet downstream of existing outfall S/N 001.

Flow

The flow limitation for the Groundwater Treatment Facility 2 is proposed at 0.150 MGD, maximum day. This will be a continuous discharge.

Tetrachloroethylene

Tetrachloroethylene is present in groundwater extracted at the site. The draft permit contains a monthly average tetrachloroethylene effluent limitation of 3.3 ug/1. This limitation is based on the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on past effluent monitoring data from the Central Groundwater Treatment System and the design of the proposed treatment system, this effluent limitation can be reliably met. Sampling is required twice per month.

Trichloroethylene

Trichloroethylene is present in groundwater extracted at the site. The draft permit contains a monthly average trichloroethylene effluent limitation of 30 ug/1. This limitation is based upon the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on past effluent monitoring data from the Central Groundwater Treatment System and the design of the proposed treatment system, this effluent limitation can be reliably met. Sampling is required twice per month.

Vinyl chloride

Vinyl chloride results from the breakdown of trichloroethylene and tetrachloroethylene and is present in the contaminated groundwater. The draft permit contains a monthly average vinyl chloride effluent limitation of 2.4 ug/1. This limitation is based upon the instream criteria for "Organisms Only Consumption" in the Vermont Water Quality Standards. Based on past effluent monitoring data from the Central Groundwater Treatment System and the design of the proposed treatment system, this effluent limitation can be reliably met. Sampling is required twice per month.

Total Dichloroethenes, Ethylbenzene and xylene

Dichloroethenes result from the breakdown of trichloroethylene and tetrachloroethylene and various forms of dichloroethenes are present in groundwater at the site. Appendix C of the Vermont Water Quality Standards does not contain any criteria for Total Dichloroethenes. Therefore a "monitor only" requirement for Total Dichloroethenes has been included in this permit. Sampling is required twice per month.

Ethylbenzene and xylene have been detected in the extracted groundwater in low concentrations. Therefore a "monitor only" requirement with sampling once per quarter is proposed to confirm the proper operation of the treatment system.

pH

The permit establishes a pH limitation of 6.5 - 8.5 Standard Units. This limitation is based on the Vermont Water Quality Standards. Sampling is required twice per month.

V. Procedures for Formulation of Final Determinations

The public comment period for receiving comments on this draft permit is from **May 26 through June 26, 2017** during which time interested persons may submit their written views on the draft permit. All written comments received by 4:30 PM on **June 26, 2017** will be retained by the Secretary and considered in the formulation of the final determination to issue, deny or modify the draft permit. The period of comment may be extended at the discretion of the Secretary.

Written comments should be sent to:

Agency of Natural Resources  
Department of Environmental Conservation  
Watershed Management Division  
One National Life Drive, Main Building, 2nd Floor  
Montpelier, VT 05620-3522

Comments may also be faxed to 802-828-1544 or submitted by e-mail to [ANR.WSMDWastewaterComments@vermont.gov](mailto:ANR.WSMDWastewaterComments@vermont.gov)

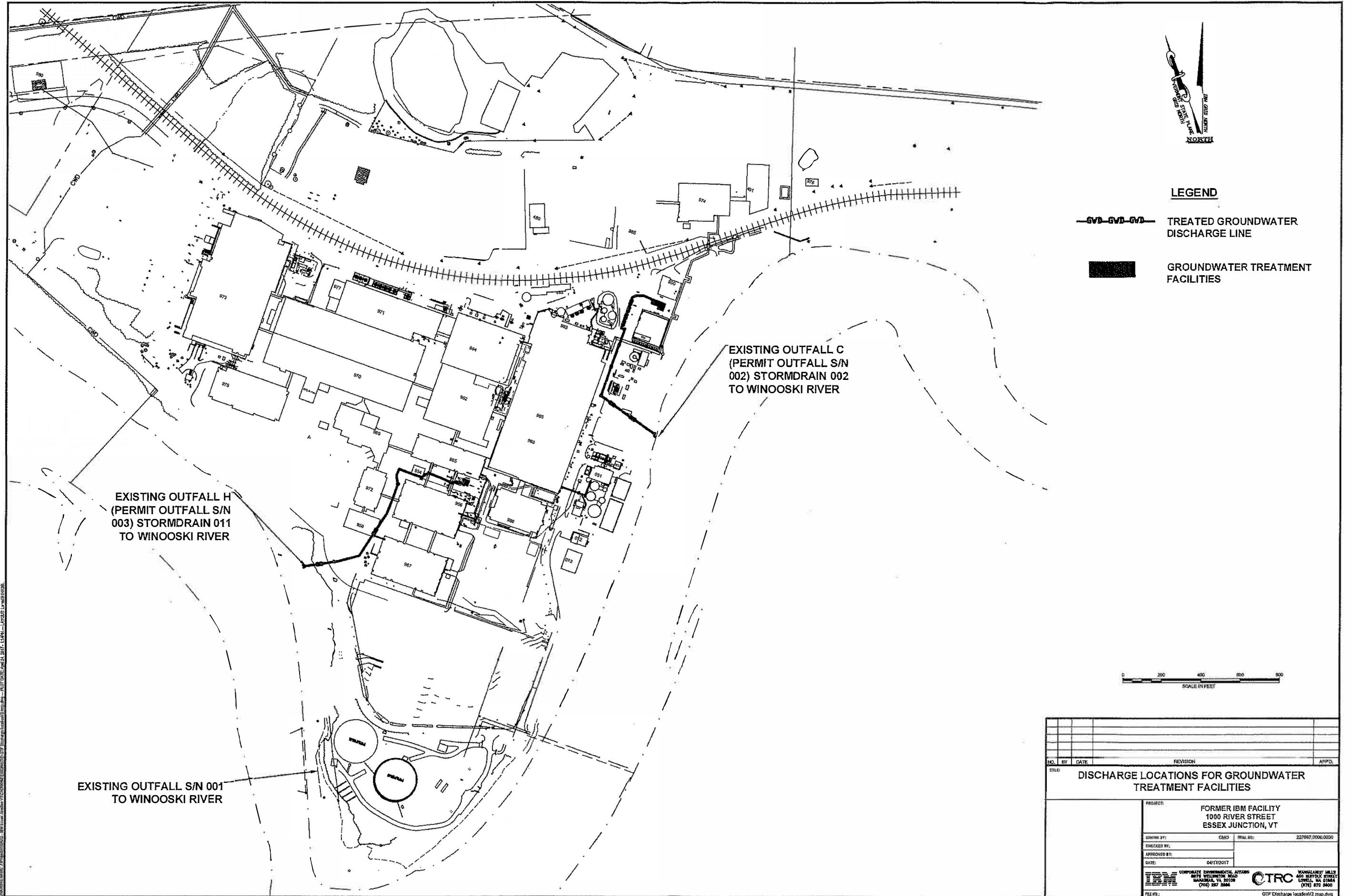
For additional information, contact Jessica Bulova at 802-828-1535.

Any interested person or groups of persons may request or petition for a public hearing with respect to this draft permit. Any such request or petition for a public hearing shall be filed within the public comment period described above and shall indicate the interest of the party filing such request and the reasons why a hearing is warranted.

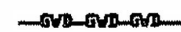

The Secretary will hold a hearing if there is significant public interest in holding such a hearing. Any public hearing brought in response to such a request or petition will be held in the geographical area of the proposed discharge or other appropriate area, at the discretion of the Secretary and may, as appropriate, consider related groups of draft permits. Any person may submit oral or written statements and data concerning the draft permit at the public hearing. The Secretary may establish reasonable limits on the time allowed for oral statements and may require the submission of statements in writing. All statements, comments, and data presented at the public hearing will be retained by the Secretary and considered in the formulation of the final determination to issue, deny, or modify the draft permit.

The complete application, draft permit, and other information are on file and may be inspected by appointment on the 2nd floor of the Main Building at One National Life Drive, Montpelier, Vermont. Copies may be obtained by calling 802-828-1535 from 7:45 AM to 4:30 PM Monday through Friday, and will be made at a cost based upon the current Secretary of State Official Fee Schedule for Copying Public Records. The draft permit and Fact Sheet may also be viewed on the Watershed Management Division's website at <http://www.watershedmanagement.vt.gov>.

# ATTACHMENT A



### LEGEND

-  TREATED GROUNDWATER DISCHARGE LINE
-  GROUNDWATER TREATMENT FACILITIES

EXISTING OUTFALL H  
(PERMIT OUTFALL S/N  
003) STORMDRAIN 011  
TO WINOOSKI RIVER

EXISTING OUTFALL C  
(PERMIT OUTFALL S/N  
002) STORMDRAIN 002  
TO WINOOSKI RIVER

EXISTING OUTFALL S/N 001  
TO WINOOSKI RIVER



NO.	BY	DATE	REVISION	APPRO.
<b>TITLE</b> DISCHARGE LOCATIONS FOR GROUNDWATER TREATMENT FACILITIES				
<b>PROJECT</b> FORMER IBM FACILITY 1000 RIVER STREET ESSEX JUNCTION, VT				
<b>DRAWN BY:</b> CMG		<b>FINAL NO.:</b> 227597.0000.0000		
<b>CHECKED BY:</b>				
<b>APPROVED BY:</b>				
<b>DATE:</b> 04/17/2017				
<small>                         CORPORATE ENVIRONMENTAL AFFAIRS                          1075 WASHINGTON ROAD                          WASHINGTON, VT 05676                          (705) 257-3384                     </small>		<small>                         ENVIRONMENTAL HILLS                          400 HARTFORD STREET                          CORVALLIS, VA 21844                          (878) 870-8600                     </small>		
<b>FILE NO.:</b> GTF Discharge_locs6x12.mxd.dwg				



AGENCY OF NATURAL RESOURCES  
DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
WATERSHED MANAGEMENT DIVISION  
1 NATIONAL LIFE DRIVE – MAIN 2  
MONTPELIER, VERMONT 05620-3522

NOTICE: DRAFT AMENDED DISCHARGE PERMIT

PUBLIC NOTICE NUMBER: 3-1559

PUBLIC COMMENT PERIOD: May 26 – June 26, 2017

**PERMITTEE INFORMATION**

PERMITTEE NAME: International Business Machines

PERMITTEE ADDRESS: 8976 Wellington Road  
Manassas, VA 20109-3925

PERMIT NUMBER: 3-1559

PROJECT ID NUMBER: EJ91-0002.09

**DISCHARGE INFORMATION**

NATURE: Treated groundwater from groundwater remediation systems.

VOLUME: 0.7644 MGD total from three outfalls

RECEIVING WATER: Winooski River

EXPIRATION DATE: March 31, 2020

DESCRIPTION: This is a draft amended discharge permit proposed for issuance to IBM for the discharge of treated groundwater from groundwater remediation systems from their facility on 1000 River Road in Essex Junction to the Winooski River.

**TENTATIVE DETERMINATIONS**

Tentative determinations regarding effluent limitations and other conditions to be imposed on the pending Vermont permit have been made by the State of Vermont Agency of Natural Resources (VANR). The limitations imposed will assure that the Vermont Water Quality Standards and applicable provisions of the Federal Clean Water Act, PL 92-500, as amended, will be met.

**FURTHER INFORMATION**

The complete application, proposed permit, and other information are on file and may be inspected by appointment on the 2<sup>nd</sup> floor of the Main Building at 1 National Life Drive, Montpelier, Vermont. Copies, obtained by calling 802-828-1535 from 7:45 AM to 4:30 PM Monday through Friday, will be made at a cost based upon the current Secretary of State Official Fee Schedule for Copying Public Records. The draft permit and fact sheet may also be viewed on the Division's website at <http://dec.vermont.gov/watershed/wastewater/public-notices--fact-sheets--draft-permits>.

**PUBLIC COMMENTS/PUBLIC HEARINGS**

Written public comments on the proposed permit are invited and must be received on or before the close of the business day (4:30 pm) on **June 26, 2017** to the Agency of Natural Resources, Department of Environmental Conservation, Watershed Management Division, 1 National Life Drive – Main 2, Vermont 05620-3522. Comments may also be submitted by e-mail using the e-mail comment provisions included at <http://dec.vermont.gov/watershed/wastewater/public-notices--fact-sheets--draft-permits>. All comments received by the above date will be considered in formulation of the final determinations.

During the notice period, any person may submit a written request to this office for a public meeting to consider the proposed permit. The request must state the interest of the party filing such request and the reasons why a meeting is warranted. A meeting will be held if there is a significant public interest (including the filing of requests or petitions for such meeting) in holding such a meeting.

**FINAL ACTION/RIGHTS TO APPEAL TO THE ENVIRONMENTAL COURT**

At the conclusion of the public notice period and after consideration of additional information received during the public notice period, VANR will make a final determination to issue or to deny the permit. Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Court within 30 days of the date of the decision. The appellant must submit the Notice of Appeal and include the applicable filing fee, payable to the state of Vermont.

The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Court; and must be signed by the appellant or their attorney. In addition, the appeal must give the address or location and the description of the property, project or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal.

The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings.

The address for the Vermont Environmental Court is: Vermont Superior Court, Environmental Division, 32 Cherry Street, 2<sup>nd</sup> Floor, Suite 303, Burlington VT 05401 (Tel. (802) 951-1740). For further information, see the Vermont Rules for Environmental Court Proceedings, available online at [www.vermontjudiciary.org](http://www.vermontjudiciary.org).

Emily Boedecker, Commissioner  
Department of Environmental Conservation