SECTION 10.0

CLOSURE PLAN, POST-CLOSURE PLAN, AND FINANCIAL REQUIREMENTS

10.1 INTRODUCTION

This section describes the procedures GLOBALFOUNDRIES will use to close the facility partially (i.e. closure of one or more hazardous waste management units, such as a tank) during its operating life or to close the facility completely (i.e. final closure). This plan addresses all RCRA hazardous waste management units subject to this permit. GLOBALFOUNDRIES will retain a copy of the approved closure plan and any revisions to the plan at this facility until a certification of final closure has been submitted to and approved by the Vermont Agency of Natural Resources Secretary (Secretary). A Pre-closure Notification Form will be completed in conformance with Vermont's Hazardous Waste Generator Closure Procedure and must be submitted to the Secretary at least 90 days prior to the commencement of closure activities. In the event of partial closure, a unit specific partial closure plan may be required based on the Pre-closure Notification Form.

Closure activities discussed throughout this document are applicable to final and/or partial closure unless otherwise noted.

10.2 DESCRIPTION OF CLOSURE PLAN

10.2.1 Closure Performance Standard

This closure plan will minimize or eliminate post-closure maintenance and threats to human health and to the environment. The hazardous waste closure activities will be conducted in accordance with applicable Vermont (VHWMR § 7-309(c)), federal RCRA (40 CFR § 264.197) and other applicable regulations and guidance documents. GLOBALFOUNDRIES will update the closure plan whenever modifications to the facility make revisions necessary.

GLOBALFOUNDRIES is responsible for the remediation of any release of hazardous material that occurs after the July 1, 2015 transfer of facility ownership. IBM Corporation is responsible for remediation of any hazardous material release prior to the July 1, 2015 transfer of facility ownership. Including historic corrective action documented in State of Vermont Consent Order docket number 620-6-15CNCV. Discharge points, i.e. treated ground water, from the outlet of the corrective action remediation system(s) are also regulated under IBM's NPDES permit # 3-1559.

10.2.2 Closure Completion Guidelines

For the purpose of this plan, a 30-year life will be assumed for this facility, making the expected time of final closure March 1, 2048.

Facility closure shall not be considered to have been completed until:

(a) GLOBALFOUNDRIES and an independent Vermont-licensed professional engineer have provided the Secretary written certification that the closure has been completed in accordance with the provisions of the Closure Plan;
(b) The Secretary has inspected the facility (if applicable); and
(c) The Secretary has given written approval of the closure.

10.2.3 Maximum Waste Inventory

Current maximum waste inventory for each permitted hazardous waste management unit is identified below. Waste inventories will either be treated on-site or shipped off-site to a permitted reclamation, treatment, or disposal facilities in accordance with this permit and all applicable regulations. The final disposition method and facility for each waste type will be selected based on the waste characterization and relative cost. However, for the purposes of the closure cost estimate included as Table 10-2 of this plan, it has been assumed that all wastes will be transported off-site for disposal.

The maximum waste inventory for the facility is equivalent to the sum of the following volumes:

1. 5,280 gallons of hazardous waste in the CDC flammable waste storage room (equivalent to 96 55-gallon drums)

2. 60,720 gallons of hazardous waste in the CDC waste storage room (equivalent to 1,104 55-gallon containers, of which 545 55-gallon drums may contain liquid hazardous waste)

3. Above-ground waste tanks:

General Solvent	(3 tanks) 30,000 gallons
Mid-UV waste	(1 tank) 10,000 gallons
(Former Deep-UV waste Out Of Service)	(1 tank) 10,000 gallons
Deep-UV waste (former General Solvent)	(1 tank) 10,000 gallons
Building 963 north	(1 tank) 9,000 gallons
TOTAL	**(7 tanks) 69,000 gallons**

Spill containment tanks are normally empty and are not included in the site waste storage capacity.

10.2.4 Health and Safety Approach

All closure activities will be conducted in accordance with appropriate health and safety procedures, including the Emergency Response Plan, and Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1910.120. Confined space entry procedures will be conducted in accordance with 29 CFR 1910.146. GLOBALFOUNDRIES will ensure all personnel involved in closure activities have current 40-Hour OSHA training and use appropriate personal protective equipment (PPE). Initial assessment of working conditions will be completed prior to initiation of closure activities. Assessment of working conditions will continue throughout closure activities; air monitoring will be performed with a portable air monitoring device appropriate for the potential VOCs. Such devices as portable photoionization detector (PID), a flame ionization detector (FID) to evaluate whether respiratory protection is required and, if so, the level of respiratory protection required. . It is anticipated that no concentrations of total volatile organic compounds (VOCs) in air will be found above background concentrations, and therefore no respiratory protection should be necessary. Personnel responsible for safety under OSHA will determine additional appropriate actions. Spill equipment will be available for use in case of an inadvertent release of waste materials or wash water during decontamination activities.

10.2.5 Preparation for Closure

10.2.5.1 Containerized Waste Removal

Containerized hazardous wastes will be handled and removed from permitted hazardous waste management storage rooms in accordance with this permit and applicable regulatory requirements and guidance. Waste will be loaded directly on trucks or rail cars with forklifts designed for moving either pallets that are securely loaded with multiple containers, or fitted with drum-handling devices for single-drum transfers.

All containers will be prepared for shipment and sealed in accordance with applicable Vermont, EPA and DOT requirements. All secondary containment trays used for storing containerized hazardous wastes in the permitted hazardous waste management units will be power-washed. The “power-wash” process will consist of power washing three times using industrial detergent and hot water prior to removal from the units. The resulting wash water will be collected in a portable container for analysis, characterization and disposal. A representative sample of the wash-water resulting from the third power wash will be analyzed for potential contaminants in order to verify they are below LDR Universal Treatment Standards for wastewaters.

10.2.5.2 Bulk Waste Removal

Prior to conducting any tank closure activities, all flow to the waste tanks will be shut off at the manufacturing buildings, and any waste contained in ancillary equipment and piping located between the manufacturing buildings and waste tanks will be drained into the tanks. Waste contained in the tanks will then be removed and transferred to trucks or rail cars using standard waste transfer practices, and shipped to off-site reclamation, treatment, or disposal facilities

permitted to accept such waste. After the waste has been removed from the tanks, the ancillary equipment and piping will be flushed with water and detergent three times. A representative sample of the each resulting wash-water will be collected for analysis and characterization. After the wash-water has been pumped out, the manway cover of each tank will be removed and the air present within the tanks will be tested for potentially explosive concentrations of vapors, oxygen content, and the presence of VOCs. As needed, tank entry will occur to manually remove residual liquid, sludge and scaling. Residual waste liquid, sludge and scaling removed from the tanks will either be accumulated in 55-gallon drums and transferred to trucks, or transferred directly to rail cars using standard waste transfer practices, and shipped to off-site reclamation, treatment, or disposal facilities permitted to accept such waste.

10.2.6 Decontamination Approach for Concrete and Coated Concrete

This section pertains to the decontamination of concrete and coated concrete structures including storage room walls and floors and secondary containment within the CDC tank farm. Decontamination of concrete and coated concrete will be conducted to achieve 40 CFR 268.45 Treatment standards for hazardous debris.

Prior to decontamination, any concrete will be visually inspected for evidence of releases, stains, and cracks and/or expansion joints. If no stains are observed in the vicinity of cracks and/or expansion joints, the cracks and/or expansions joints will be sealed with grout or cement. If staining is observed in the vicinity of cracks and or expansion joints, further investigation of the area will be conducted prior to sealing and decontamination. Such investigation may include testing of underlying soils.

Spill-control equipment consisting of absorbent materials, brooms, and shovels will be readily available near each hazardous waste management unit when decontamination activities are being conducted in the event that a spill occurs.

The following decontamination steps will be followed for concrete and coated concrete materials:

- Temporary berms and dikes will be placed in doorways (as applicable) and around the perimeter of the units to contain all wash-waters generated during decontamination activities.
- Surfaces of the units (i.e., concrete columns and walls), up to a height of 4 feet above the floor surface, along with the floor surfaces will be dry-swept and the resulting waste materials collected and containerized in 55-gallon steel drums for characterization, transportation, and off-site disposal.
- Surfaces of the units will be decontaminated as follows:
    - CDC Waste Storage room will be power-washed using an industrial detergent and hot water.

    - Since wastes stored in the CDC Flammable Waste Storage room are stored within secondary containment pallets and tubs, the room provides tertiary containment. The surfaces of the unit will be visually evaluated to determine if decontamination is required. Due to the room design for fire safety, decontamination would involve mopping and/or wiping surfaces with a detergent (decon per treatment standards for hazardous debris 40 CFR 268.45). Power-washing is not feasible due to the exterior wall design, the storage of virgin chemicals in the same area and no immediate means of wash water collection.
    - CDC Tank Farm surfaces of secondary containment will be power-washed using an industrial detergent and hot water.
- Wash-water from the cleaning operations will be collected in a portable bulk container for characterization and subsequent disposal at an off-site facility permitted to accept such waste. Within the CDC waste storage room, washwater will drain to the secondary containment tank, from which it will be transferred to a portable bulk container for characterization and subsequent disposal.

Post decontamination inspection of concrete will be performed to verify that decontamination is complete, any concrete will be visually inspected for evidence of releases, stains, and cracks and/or expansion joints. If post decontamination staining is observed in the vicinity of cracks and or expansion the area may be decontaminated a second time. After a second decontamination if stains are observed in the vicinity of cracks and or expansion joints then confirmatory sampling of the concrete and underlying soil will be conducted to verify that the contamination is at an acceptable level per 40 CFR 268.48 LDR Universal Treatment Standards.

10.2.7 Decontamination Approach for Metal

This section pertains to the decontamination of steel structures including bulk storage tanks, ancillary equipment, piping and secondary containment lining within the CDC tank farm.

Spill-control equipment consisting of absorbent materials, brooms, and shovels will be readily available near each hazardous waste management unit when decontamination activities are being conducted in the event a spill occurs.

The following decontamination steps will be followed for metal:

- Surfaces will be decontaminated as follows:
    - Ancillary equipment (i.e piping, pumps, valves, etc.) that came into contact with hazardous material will be decontaminated by flushing (with water and detergent) three times.
    - Interior tank surfaces will be power-washed. If tank entry is required, such entry will be performed using confined-space entry procedures. Qualified tank cleaning personnel will be outfitted with appropriate PPE (i.e., Level C or B), including respiratory protection.
    - The secondary containment structures for the bulk waste storage tanks will be swept and then visually inspected for evidence of releases, stains, and/or cracks.

Any resulting waste materials collected will be containerized in 55 gallon steel drums for characterization, transportation, and off-site disposal.
Prior to pressure-washing, deterioration of metal or welds will be sealed or welded to prevent seepage.

- All wash waters will be collected in a portable tank located near the unit being decontaminated for characterization and subsequent disposal at an off-site facility permitted to accept such waste.
- If the metal cannot be decontaminated until visibly clean and if analysis of a representative sample of the third wash-water shows residual contamination is at unacceptable levels, or if it is determined that decontamination is not practical, the metal will be transported and disposed of at an off-site disposal facility permitted to accept such waste.

The concrete secondary containment structures for the bulk storage tanks were lined with steel in 1989, which was tested for water tightness upon installation. The steel liners shall be sampled and removed and the concrete below them shall subsequently be inspected, decontaminated and sampled according to Section 10.2.6.

Post decontamination inspection of metal surfaces (e.g. bulk storage tanks, ancillary equipment, piping and secondary containment lining) will be visually inspected to verify that decontamination is complete.

10.2.8 Confirmatory Sampling

10.2.8.1 Concrete Confirmatory Sampling

Once decontamination/power-washing has been completed and if staining is observed a representative sample of the third wash-water or concrete core or chip samples will be collected for analysis in accordance with applicable regulations and guidance documents. Sample locations will be biased to grid squares where visible stains or cracks are found in the concrete, based on visual inspection of the concrete performed after decontamination.

10.2.8.2 Metal Confirmatory Sampling

After decontamination activities~~,~~ a representative sample of the third wash-water will be collected for analysis. The sample will be collected to confirm that the residual contamination is at an acceptable level.

If the residual contamination is at an acceptable level per 40 CFR 268.48 LDR Universal Treatment Standards, the metal will be considered to be non-hazardous waste and will be removed and disposed of at an off-site facility permitted to accept such waste. Alternatively, based on additional evaluation of the characterization data, the metal may be sent to a scrap

metal recycler. If any of the sample concentrations exceed acceptable levels, the metal will be decontaminated again and re-sampled until sample concentrations are acceptable.

Alternatively, at any time during the sampling activities, GLOBALFOUNDRIES or another third party representative, contractor may elect to remove the metal and dispose of it as a hazardous waste (based on characterization and in accordance with applicable regulations) at a permitted off-site disposal facility.

10.2.9 Removal

10.2.9.1 Concrete Removal

Prior to demolition and removal, concrete will be visually inspected, decontaminated and sampled per section 10.2.6. If the contaminant concentrations in the concrete samples are below the standards set forth in section 10.2.6 and do not exhibit any RCRA hazardous waste characteristics, the concrete will be considered as non-hazardous waste and will be rubblized, removed and disposed of at a permitted off-site facility. Alternatively, the concrete may be used as fill upon written approval from the Vermont Solid Waste Management Program. If any of the sample concentrations exceed the standards set forth in 10.2.6, the structure will be decontaminated again and re-sampled. If the contaminant concentrations in the second sample exceed the standards set forth in 10.2.6 the concrete will be managed as hazardous waste.

Alternatively, at any time during the sampling activities, GLOBALFOUNDRIES or a third party representative may elect to remove the concrete and dispose of it as a hazardous waste, in accordance with applicable regulations, at a permitted off-site disposal facility.

Concrete will be rubblized. For practical purposes, concrete debris may be marked (e.g., with orange spray paint) and visually segregated and stockpiled on-site after demolition of selected building sections. Concrete debris will be transferred to stockpiles underlain and overlain with plastic sheeting and/or lined roll-off boxes.

10.2.9.2 Metal Removal

Metal piping, tanks, and structures will be disassembled or cut into pieces, as needed, and removed for recycling or disposal based on confirmatory wash-water sampling results. If the metal cannot be adequately decontaminated, it will be transferred to stockpiles underlain and overlain with plastic sheeting and/or lined roll-off boxes. For the purposes of developing the cost estimate for disposal of metal for this closure plan, it was assumed that the tanks and piping would be disposed of as non-hazardous scrap metal in accordance with VHWMR §7-204(e).

10.2.9.3 Soil Removal

If soil contamination is identified or suspected during closure, soil will be evaluated and managed in accordance with the Agency's **Investigation and Remediation of Contaminated Properties Rule**.

10.2.10 Hazardous Waste Management Approach

10.2.10.1 Hazardous Waste Characterization

Characterization data for all waste materials generated during closure activities (e.g., floor sweepings, wash-water, concrete) will be compared to the standards in Vermont Hazardous Waste Management Regulations Subchapter 2, §7-205 (Ignitability), §7-206 (Corrosivity), §7-207 (Reactivity) and §7-208 (Toxicity) Table 1, entitled, "Maximum Concentration for the Toxicity Characteristic" (also known as TCLP limits), excluding pesticides and herbicides. Listed hazardous waste codes will be applied based on a combination of site history and analysis as required. If appropriate, generator knowledge and previous waste stream characterization information may be utilized to determine if wastes are characteristically and/or listed hazardous waste. Should the results of the waste characterization process show that the waste does not exhibit a characteristic of hazardous waste and no evidence exists to support the application of a hazardous waste listing, the waste may be managed as non-hazardous waste.

A minimum of one representative sample of each waste generated during closure of each hazardous waste management unit will be collected and analyzed. The samples will be collected and analyzed using EPA Method SW-846 test methods to determine appropriate waste disposal methods. Waste characterization and disposition will be documented in the Closure Certification Report.

10.2.10.2 Off-Site Disposal Procedures

Shipments of waste materials from the site will be made in accordance with applicable waste management and transportation regulations. The materials will be transported using a waste transporter permitted according to Vermont regulations. Shipments will be disposed of at off-site facilities permitted to accept such waste.

Information about all wastes streams generated during closure; the disposal option selected for each waste stream; and the waste transporters, disposal facilities, and scrap facilities to which waste was shipped will be documented in the Closure Certification Report. Copies of all shipping documents, including hazardous waste manifests, used to transport wastes shipped off-site will be provided as attachments to the Closure Certification Report.

10.3 SCHEDULE FOR CLOSURE

See Table 10-1.

Table 10-1
Closure Schedule

Task	Scheduled Completion (Days after receipt of last hazardous waste)
Pre-closure notification form submitted	90 days prior to closure commencement
Start of final closure (begin inventory removal)	30
Removal of tank and container waste inventory (treated on-site or shipped off-site)	90
Decontamination of tanks and associated piping, pumps, valves, and ancillary equipment	150
Decontamination of CDC Waste Storage Room, CDC Transfer Room, and CDC Flammable Waste Storage Room	150
Decontamination of secondary containment system	170
Treatment / disposal of wash solutions	180
Disassembly of piping, pumps, valves, and ancillary equipment	180
Removal of aboveground waste storage tanks and secondary containment tank and structures	180

10.4 POST CLOSURE PLANS

IBM's (previous property owner) industrial landfill was closed prior to November 19, 1980. Post-closure plans are not required.

10.5 NOTICE IN DEED AND NOTICE TO LOCAL LAND AUTHORITY

IBM's (previous property owner) industrial landfill was closed prior to November 19, 1980. Requirements for a notice in the property deed and notification of local land authority do not apply.

Some general property use restrictions have been identified as part of the transfer of ownership of the property from IBM Corporation to GLOBALFOUNDRIES U.S. 2 LLC.

10.6 CLOSURE COST ESTIMATE

The final closure cost in updated 2019 dollars for the disposal of the maximum hazardous waste inventory and decontamination and closure of the hazardous waste management facility is estimated to be $5,056,003 (Table 10-2). The costs were projected from current waste disposal costs and all third-party costs associated with closure activities. The costs provided in Table 10-2

include all project oversight and labor costs, and expenses associated with the waste sampling and profiling; waste disposal; tank, equipment and secondary containment area decontamination; some estimated soil excavation and disposal; verification sampling, and final reporting and third-party certification activities. These costs reflect the most expensive costs associated with the closure of the hazardous waste storage facility (e.g., the tanks contain the maximum capacity of waste, the storage areas contain the maximum number of containers of waste allowed under the permit) (containerized and bulk waste composition are based on 2006 usage). See Attachment 10-1 for the detailed closure cost estimates compiled for GLOBALFOUNDRIES by a third-party consultant in 2007. These estimates are the basis for the costs identified in Table 10-2 and have since been adjusted annually for inflation.

The more expensive disposal option was selected whenever multiple disposal options were available for a waste stream (e.g., disposal of soil or concrete wastes generated during closure was assumed to be hazardous waste disposal). Steel tanks and equipment were not considered to be scrap and therefore no salvage value was assumed, but rather they were assumed to be disposed of as either hazardous or non-hazardous waste as previously discussed. Table 10-2 summarizes these costs. In conformance with GLOBALFOUNDRIES current operating practices, it is likely that some waste streams will be sold for reclamation or fuel blending at final closure; however, the costs included in Table 10-2 reflect off-site disposal of all wastes associated with the closure activities.

This closure cost estimate will be revised whenever changes occur in the closure plan that affect closure costs, and, at a minimum, the closure cost estimate will also be adjusted annually to account for inflation. A copy of the closure cost estimate will be filed at GLOBALFOUNDRIES and submitted to the Secretary at least annually. The annually updated closure cost estimate will be used in the demonstration of financial assurance required by 40 CFR 264.143, as included in Appendix F.

Table 10-2 Overall Cost Estimate for RCRA Closure Activities	
	Estimated Cost (Updated 2019 Dollars)
CDC WASTE STORAGE ROOM (INCLUDES CDC TRANSFER ROOM)	
Engineering	$164,302.96
Construction	$329,841
Transportation & Disposal – Max Inventory	$456,886
Transportation & Disposal – Closure Wastes	$359,688
Laboratory Analytical	$84,005
TOTAL CDC WASTE STORAGE ROOM	$1,394,722
CDC FLAMMABLE WASTE STORAGE ROOM	
Engineering	$53,121
Construction	$38,296
Transportation & Disposal – Max Inventory	$39,729
Transportation & Disposal – Closure Wastes	$39,334
Laboratory Analytical	$13,589
TOTAL CDC FLAMMABLE WASTE STORAGE ROOM	$184,069
CDC TANK FARM	
Engineering	$196,422
Construction	$1,295,770
Transportation & Disposal – Max Inventory	$144,537
Transportation & Disposal – Closure Wastes	$897,366
Laboratory Analytical	$90,923
TOTAL CDC TANK FARM	$2,625,018
BUILDING 963 NORTH TANK	
Engineering	$39,532
Construction	$56,827
Transportation & Disposal – Max Inventory	$21,681
Transportation & Disposal – Closure Wastes	$62,324
Laboratory Analytical	$12,354
TOTAL BUILDING 963 NORTH TANK	$192,716
SUBTOTAL	$4,396,525
TOTAL CONTINGENCY (15%)	$659,479
TOTAL CLOSURE COSTS	**$5,056,003**

ATTACHMENT 10-1

2007 BASIS FOR CLOSURE COST ESTIMATE

OVERALL COST ESTIMATE

7/11/2007

RCRA CLOSURE ACTIVITIES
INTERNATIONAL BUSINESS MACHINE
ESSEX JUNCTION, VERMONT

WASTE STORAGE UNIT	ENGINEERING	CONSTRUCTION	TRANSPORTATION & DISPOSAL	LABORATORY ANALYTICAL	TOTAL
CDC Container Storage Area	$133,000	$267,000	$661,000	$68,000	$1,129,000
CDC Flammable Waste Storage Room	$43,000	$31,000	$64,000	$11,000	$149,000
CDC Tank Farm	$159,000	$493,000	$724,000	$80,000	$1,456,000
AST Northeast of Building 963	$32,000	$46,000	$68,000	$10,000	$156,000
Subtotal	$367,000	$837,000	$1,517,000	$169,000	
Contingency (15%)	$55,000	$126,000	$228,000	$25,000	
TOTAL	$422,000	$963,000	$1,745,000	$194,000	**$3,320,000**

COST ESTIMATE

CHEMICAL DISTRIBUTION CENTER CONTAINER STORAGE AREA (INCLUDING SOLVENT TRANSFER ROOM)
INTERNATIONAL BUSINESS MACHINE
ESSEX JUNCTION, VERMONT

	Closure Units	*Approximate Quantity*	*Unit Price*	*Maximum Total Price*
Engineering Costs				
Preparation of SOW	-	-	-	$24,306
Engineering/Oversight - Waste Removal	-	-	-	$14,444
Engineering/Oversight - Decontamination	-	-	-	$13,685
Engineering/Oversight - Verification	-	-	-	$14,444
Engineering/Oversight - Decommission	-	-	-	$18,860
Engineering/Oversight - Investigation, if necessary	-	-	-	$13,064
Engineering/Oversight - Remediation, if necessary	-	-	-	$16,818
Field Equipment - Sampling, PPE, Drilling Subcontractor	-	-	-	$8,000
Certification	-	-	-	$9,736
			Engineering Costs Sub-Total	**$133,357**
Construction Subcontractor Costs				
Decontamination Pad	Each	1	$2,105	$2,105
Decontamination - Floor	Sq. Ft.	5425	$5	$27,125
Concrete Removal (8-inch thick) - Handling / Segregation / Loading	Ton	276	$150	$41,400
Soil Excavation (3-foot depth)	Ton	900	$25	$22,500
Backfill and Grading	Ton	900	$12	$10,800
Restoration (Concrete replacement)	Sq. Ft.	5425	$30	$162,750
			Construction Subcontractor Costs Sub-Total	**$266,680**
Transportation and Disposal Costs				
Hazardous Waste (55-gal drums)	Each	1104	$335	$369,840
Wash solution (0.5 gal / ft^2)	Gal.	2700	$1.10	$2,970
Concrete (Hazardous)	Ton	276	$245	$67,620
Soil (Hazardous)	Ton	900	$245	$220,500
			Transportation and Disposal Costs Sub-Total	**$660,930**
Analytical Laboratory Costs				
Investigation/Confirmatory Samples (1)				
Appendix IX VOCs, SVOCs, metals	Ea.	106	$433	$45,898
PCBs	Ea.	106	$50	$5,300
Appendix IX Pesticides/Herbicides	Ea.	10	$203	$2,030
Waste Characterization				
Liquid Waste in Drums	Ea.	10	$909	$9,090
Concrete	Ea.	2	$909	$1,818
Soil	Ea.	2	$909	$1,818
Decontamination Wash Water	Ea.	2	$909	$1,818
			Analytical Laboratory Costs Sub-Total	**$67,772**
			Total Costs	**$1,128,739**

Notes:

(1) Per The Vermont Hazardous Waste Generator and Facility Closure Guidance Document revised May 2005.
The Container Storage Area includes the Solvent Transfer Room.

7/11/2007

COST ESTIMATE

CHEMICAL DISTRIBUTION CENTER FLAMMABLE WASTE STORAGE ROOM
INTERNATIONAL BUSINESS MACHINE
ESSEX JUNCTION, VERMONT

	Closure Units	*Approximate Quantity*	*Unit Price*	*Maximum Total Price*
Engineering Costs				
Preparation of SOW	-	-	-	$6,698
Engineering/Oversight - Waste Removal	-	-	-	$4,393
Engineering/Oversight - Decontamination	-	-	-	$3,669
Engineering/Oversight - Verification	-	-	-	$3,795
Engineering/Oversight - Decommission	-	-	-	$3,174
Engineering/Oversight - Investigation, if necessary	-	-	-	$5,014
Engineering/Oversight - Remediation, if necessary	-	-	-	$6,302
Field Equipment - Sampling, PPE, Drilling Subcontractor	-	-	-	$4,750
Certification	-	-	-	$4,888
		Engineering Costs Sub-Total		**$42,682**
Construction Subcontractor Costs				
Decontamination Pad	Each	1	$2,105	$2,105
Decontamination - Floor	Sq. Ft.	600	$5	$3,000
Concrete Removal (8-inch thick) - Handling / Segregation / Loading	Ton	30	$150	$4,500
Soil Excavation (3-foot depth)	Ton	100	$25	$2,500
Backfill and Grading	Ton	100	$12	$1,200
Restoration (Concrete Replacement)	Sq. Ft.	600	$30	$18,000
		Construction Subcontractor Costs Sub-Total		**$31,305**
Transportation and Disposal Costs				
Hazardous Waste (55-gal drums)	Each	96	$335	$32,160
Wash solution (0.5 gal / ft^2)	Gal.	300	$1.50	$450
Concrete (Hazardous)	Ton	30	$245	$7,350
Soil (Hazardous)	Ton	100	$245	$24,500
		Transportation and Disposal Costs Sub-Total		**$64,460**
Analytical Laboratory Costs				
Investigation/Confirmatory Samples [(1)]				
Appendix IX VOCs, SVOCs, metals	Ea.	12	$433	$5,196
PCBs	Ea.	12	$50	$600
Appendix IX Pesticides/Herbicides	Ea.	2	$203	$406
Waste Characterization				
Liquid Waste in Drums	Ea.	2	$909	$1,818
Concrete	Ea.	1	$909	$909
Soil	Ea.	1	$909	$909
Decontamination Wash Water	Ea.	1	$909	$909
		Analytical Laboratory Costs Sub-Total		**$10,747**
			Total Costs	**$149,194**

Notes:

(1) Per The Vermont Hazardous Waste Generator and Facility Closure Guidance Document revised May 2005.

COST ESTIMATE

CHEMICAL DISTRIBUTION CENTER ABOVEGROUND STORAGE TANK FARM
INTERNATIONAL BUSINESS MACHINE
ESSEX JUNCTION, VERMONT

	Closure Units	*Approximate Quantity*	*Unit Price*	*Maximum Total Price*
Engineering Costs				
Preparation of SOW	-	-	-	$31,492
Engineering/Oversight - Waste Removal	-	-	-	$19,159
Engineering/Oversight - Decontamination	-	-	-	$15,410
Engineering/Oversight - Verification	-	-	-	$11,891
Engineering/Oversight - Decommission	-	-	-	$23,092
Engineering/Oversight - Investigation, if necessary	-	-	-	$15,663
Engineering/Oversight - Remediation, if necessary	-	-	-	$16,210
Field Equipment - Sampling, PPE, Drilling Subcontractor	-	-	-	$16,000
Certification	-	-	-	$9,736
		Engineering Costs Sub-Total		**$158,653**
Construction Subcontractor Costs				
Decontamination Pad	Each	1	$2,105	$2,105
Decontamination - Tanks (triple rinse) / Secondary Containment	Each	7	$7,600	$53,200
Decontamination - Piping (2-inch SS) and ancillary valves/pumps	L.F.	12100	$5	$60,500
Steel Removal - Tanks	Each	7	$7,500	$52,500
Steel Removal - Piping (all pipes summed and removed together)	L.F.	2300	$33	$75,900
Steel Removal - Secondary Containment	Ton	245	$250	$61,250
Concrete Removal (12-inch thick floor and sidewalls) - Handling / Segregation / Loading	Ton	791	$150	$118,650
Soil Excavation (3-foot depth)	Ton	1250	$25	$31,250
Backfill and Grading	Ton	1250	$12	$15,000
Restoration (Soil cap)	Sq. Ft.	7400	$3	$22,200
		Construction Subcontractor Costs Sub-Total		**$492,555**
Transportation and Disposal Costs				
Hazardous Waste - Bulk General Solvent	Gal.	30000	$1.95	$58,500
Hazardous Waste - Mid-UV Waste	Gal.	20000	$1.95	$39,000
Hazardous Waste - Deep-UV Waste	Gal.	10000	$1.95	$19,500
Hazardous Waste - Ethylene Glycol	Gal.	10000	$1.95	$19,500
Wash solution (2,400 gal/tank & 1.5 gal/ft^2 for concrete & 1 gal/ft of pipe)	Gal.	33380	$1.10	$36,718
Concrete (Hazardous)	Ton	791	$245	$193,795
Steel (tanks) - Non-hazardous	Ton	273	$35	$9,555
Steel (secondary containment, piping) - Hazardous	Ton	267	$150	$40,050
Vapor Phase Carbon (7 55-gal drums) - Hazardous	Drum	7	$135.00	$945
Soil (Hazardous)	Ton	1250	$245	$306,250
		Transportation and Disposal Costs Sub-Total		**$723,813**
Analytical Laboratory Costs				
Investigation/Confirmatory Samples (1)				
Appendix IX VOCs, SVOCs, metals	Ea.	111	$433	$48,063
PCBs	Ea.	111	$50	$5,550
Appendix IX Pesticides/Herbicides	Ea.	11	$203	$2,233
Waste Characterization				
Liquid Waste in Tanks	Ea.	9	$909	$8,181
Concrete	Ea.	7	$909	$6,363
Soil	Ea.	2	$909	$1,818
Steel	Ea.	1	$909	$909
Vapor Phase Carbon	Ea.	1	$909	$909
Decontamination Wash Water	Ea.	7	$909	$6,363
		Analytical Laboratory Costs Sub-Total		**$80,389**
			Total Costs	**$1,455,410**

Notes:
(1) Per The Vermont Hazardous Waste Generator and Facility Closure Guidance Document revised May 2005.

7/11/2007

COST ESTIMATE

BUILDING 963 ABOVEGROUND STORAGE TANK
INTERNATIONAL BUSINESS MACHINE
ESSEX JUNCTION, VERMONT

	Closure Units	*Approximate Quantity*	*Unit Price*	*Maximum Total Price*
Engineering Costs				
Preparation of SOW	-	-	-	$4,800
Engineering/Oversight - Waste Removal	-	-	-	$3,703
Engineering/Oversight - Decontamination	-	-	-	$2,875
Engineering/Oversight - Verification	-	-	-	$2,507
Engineering/Oversight - Decommission	-	-	-	$1,886
Engineering/Oversight - Investigation, if necessary	-	-	-	$3,945
Engineering/Oversight - Remediation, if necessary	-	-	-	$3,646
Field Equipment - Sampling, PPE, Drilling Subcontractor	-	-	-	$4,750
Certification	-	-	-	$4,178
		Engineering Costs Sub-Total		**$32,289**
Construction Subcontractor Costs				
Decontamination Pad	Each	1	$2,105	$2,105
Decontamination - Tank/Secondary Cont.	Each	1	$7,600	$7,600
Decontamination - Piping and ancillary valves/pumps	L.F.	200	$5	$1,000
Steel Removal - Tanks	Each	1	$7,500	$7,500
Steel Removal - Piping	L.F.	200	$33	$6,600
Steel Removal - Secondary Containment	Ton	25	$250	$6,250
Concrete Removal (12-inch thick floor and sidewalls) - Handling / Segregation / Loading	Ton	60	$150	$9,000
Soil Excavation (3-foot depth)	Ton	105	$25	$2,625
Backfill and Grading	Ton	105	$12	$1,260
Restoration (Soil cap)	Sq. Ft.	625	$3	$1,875
		Construction Subcontractor Costs Sub-Total		**$45,815**
Transportation and Disposal Costs				
Hazardous Waste - Bulk Waste	Gal.	9000	$1.95	$17,550
Wash solution (2,400 gal/tank & 1.5 gal/ft^2 for concrete & 1 gal/ft of pipe)	Gal.	3538	$1.10	$3,891
Concrete (Hazardous)	Ton	60	$245	$14,700
Steel (tanks) - Non-hazardous	Ton	35	$35	$1,225
Steel (secondary containment, piping) - Hazardous	Ton	32	$150	$4,800
Soil (Hazardous)	Ton	105	$245	$25,725
		Transportation and Disposal Costs Sub-Total		**$67,891**
Analytical Laboratory Costs				
Investigation/Confirmatory Samples [(1)]				
Appendix IX VOCs, SVOCs, metals	Ea.	12	$433	$5,196
PCBs	Ea.	12	$50	$600
Appendix IX Pesticides/Herbicides	Ea.	2	$203	$406
Waste Characterization				
Liquid Waste in Tank	Ea.	1	$909	$909
Concrete	Ea.	1	$909	$909
Soil	Ea.	1	$909	$909
Decontamination Wash Water	Ea.	1	$909	$909
		Analytical Laboratory Costs Sub-Total		**$9,838**
			Total Costs	**$155,833**

Notes:

(1) Per The Vermont Hazardous Waste Generator and Facility Closure Guidance Document revised May 2005.