

SECTION 2.0

FACILITY DESCRIPTION

2.1 INTRODUCTION

This section provides a general description of GLOBALFOUNDRIES U.S. 2 LLC's manufacturing and hazardous waste storage facilities, topographic maps, traffic patterns, information to address the location standards for storage facilities, and other information required by 40 Code of Federal Regulations (CFR) Part 270.14(b).

2.2 GENERAL DESCRIPTION

The GLOBALFOUNDRIES U.S. 2 LLC (GLOBALFOUNDRIES) facility is located in Chittenden County, Vermont, on approximately 729 acres that are divided by the Winooski River and connected by a company-owned bridge. The GLOBALFOUNDRIES facility is part of the Champlain Valley Technology and Innovation Park. The Champlain Valley Technology and Innovation Park currently includes GLOBALFOUNDRIES and tenants to GLOBALFOUNDRIES. In the future, the technology park may include non-GLOBALFOUNDRIES business entities (land parcels owned by non-GLOBALFOUNDRIES businesses within the technology park footprint). GLOBALFOUNDRIES develops, manufactures, and tests semiconductor products for a variety of computer and consumer applications. The manufacturing facility, including the hazardous waste storage and treatment units, is located on approximately 237 acres which lie west of the Winooski River in the town of Essex and the village of Essex Junction. The remaining 492 acres are located east of the river in the town of Williston and contain non-manufacturing buildings. Off-site leased locations may be used for satellite operations as business needs dictate, and these operations may generate hazardous waste. GLOBALFOUNDRIES is not currently using any off-site locations. In addition, hazardous waste may be generated by emergency incidents to which GLOBALFOUNDRIES Emergency Services responds. GLOBALFOUNDRIES also operates similar manufacturing facilities in New York State that could potentially send waste to this location for storage and shipment with similar wastes generated at this location.

The mailing address for this facility is:

GLOBALFOUNDRIES U.S. 2 LLC – Vermont Facility
1000 River Street – B966
Essex Junction, Vermont 05452

The manager responsible for hazardous waste management at the facility is:

Andrew Lacourciere, Northeast Regional Environmental Manager
Telephone (802)769-0580

GLOBALFOUNDRIES will maintain, at a minimum, the Facility Operating Record required under Permit Condition 4.9 in computerized records, in the environmental central files (on GLOBALFOUNDRIES premises), in the responsible engineers' and managers' files, and/or at the designated records retention facility. Unless otherwise indicated in the operating record, the handling code for all waste received is S01 (container storage) or S02 (tank storage).

2.3 TOPOGRAPHICAL MAPS AND OTHER FACILITY INFORMATION

Topographic maps of GLOBALFOUNDRIES and the surrounding area are provided in Appendix B. Figure B-6, Appendix B, shows the topography within 1,000 feet of the hazardous waste management facility with discharge structures, major buildings, and surface waters. Figure B-1 shows the location of withdrawal wells within 1,000 feet of the property line. There are no intake structures for withdrawal of water from the Winooski River.

2.3.1 Land Use

The land around GLOBALFOUNDRIES is used for residential, commercial, agricultural, and industrial purposes. Maps illustrating the land use are attached as Figures B-2, B-3, and B-4 in Appendix B. These figures show zoning maps from the Village of Essex Junction, the Town of Essex, and the Town of Williston. The facility is not located on Indian lands.

2.3.2 Wind Rose

A wind rose for the facility using data collected at the Burlington International Airport by Iowa Environmental Mesonet is included as Figure B-5.

2.3.3 Injection and Withdrawal Wells

GLOBALFOUNDRIES' facility has no injection wells. Withdrawal wells are illustrated in Figure B-1, Appendix B.

2.3.4 Buildings; Treatment, Storage and Disposal Areas; Other Structures

Buildings, treatment, storage, and disposal areas, and other structures on the property are shown in Figure B-6, Appendix B.

2.3.5 Recreation Areas

A GLOBALFOUNDRIES employee recreation area is located on 14 acres at the northwest corner of the facility.

2.3.6 Runoff Control System

All hazardous waste storage and loading/unloading areas are spill-contained to prevent runoff. Spills at the Chemical Distribution Center (CDC) container loading/unloading area will be contained in the trench system as shown in Figure D-2-D, while spills at the CDC tank loading/unloading area will be contained in the trench system as shown in Figure D-2-7. When trucks are present in these areas, the valves in the pipes will be closed. GLOBALFOUNDRIES will remove any spilled material by use of a vacuum truck or similar device, depending upon the type and volume of material spilled.

2.3.7 Access Control and Security

Primary access is through the intersection of internal roads with state routes 2A and 117. Gates at all entrances to the site allow GLOBALFOUNDRIES to control traffic flow to and from the site. Details of the access controls and security provisions for the facility are provided in Section 6.0.

2.3.8 Fire Control

GLOBALFOUNDRIES' fire protection water system is shown in Figure B-13, Appendix B. An automatic water sprinkler system is used to protect the facility. In addition, portable fire extinguishers and fire hoses are installed throughout the buildings. At the main site, two diesel fire pumps (1,500 and 2,000 gallons per minute [gpm]) provide flow to the private underground fire mains. These pumps obtain water from a 1,000,000-gallon private storage tank supplied from a Champlain Water District connection. There is also a direct connection of the underground fire main system to the Champlain Water District system for additional water supply capacity. In addition, a water-deluge system protects the CDC tank farm and the two load/unload areas at the CDC. The Williston facility fire protection system consists of one 1,500-gpm fire pump providing flow to the underground piping system. This pump is supplied from a direct connection to the Champlain Water District feed for the site.

GLOBALFOUNDRIES Emergency Services provides full-time fire-control coverage with trained fire personnel equipped with one pumper truck. Primary fire control responsibility for GLOBALFOUNDRIES rests with the Emergency Services Department. Additional fire control information is presented in Sections 8.0 and 9.0. Agreements with local authorities are presented in Attachment 9-1.

2.3.9 Seismic Consideration

This facility is not located in an area within 200 feet of a fault that has had displacement in Holocene time; therefore, the seismic standards do not apply.

2.3.10 Flood Plain Standard

The 100-year flood elevation is 288 feet above mean sea level. This is reported in "Flood Plain

Information, Winooski River, Towns of Essex and Williston, Vermont,” prepared in 1973 for the Vermont Department of Water Resources by the U.S. Army Corps of Engineers. Hazardous waste management facilities at this GLOBALFOUNDRIES location have ground surfaces above 288 feet mean sea level. Consequently, the provisions of 40 CFR Part 264.18 (b) for facilities in flood plains do not apply. A Federal Insurance Administration (FIA) 100-year flood plain map for the Village of Essex Junction, Vermont, is enclosed as Figure B-12, Appendix B. This map shows flood plain information for the section of GLOBALFOUNDRIES property where the permitted facility is located.

2.3.11 Traffic Patterns

Vermont State Routes 2A and 117 intersect Interstate 89 and provide access to GLOBALFOUNDRIES’ facilities. Hazardous waste is shipped from the site in semi-trailer loads or tanker trucks with combined gross weight of approximately 78,000 pounds. These vehicles enter routes 117 and 2A via the Maple Street Access Road or the River Street Access Road, respectively. Approximately 5-10 outgoing shipments of hazardous waste are made each month. Site roadways supporting these shipments generally have at least an 18-inch sub-base with a 3-inch minimum bituminous-concrete pavement designed to meet American Association of State Highway and Transportation Officials (AASHTO) HS-25 loading.

Incoming shipments of small quantities of hazardous waste from off-site may arrive in trucks via State Routes 15 or 117.

2.4 HAZARDOUS WASTE MANAGEMENT

GLOBALFOUNDRIES’ waste management priority is to first try to eliminate or reduce waste at the source. All waste materials that are ultimately shipped offsite will be processed at a fully permitted facility approved to handle the specific types of waste.

The priority of methods to manage the wastes is:

1. Source reduction
2. Reuse
3. Reclamation/recycling
4. Treatment (i.e., high-temperature incineration, chemical/physical treatment)
5. Secure chemical landfill disposal

The waste management methods listed above in order of priority fulfill the generator requirements under Section 3002(b) of RCRA. This section requires the generator to select the method of treatment, storage, or disposal currently available that minimizes the present and future threat to human health and the environment. GLOBALFOUNDRIES submits an annual waste minimization update to the Vermont Waste Management & Prevention Division and/or EPA, and retains this report in the facility operating record. The most recent copy of the annual waste

minimization update can be found in Appendix C.

2.4.1 Hazardous Waste Generation

A variety of hazardous waste is produced as a result of wafer and module manufacturing, laboratory operations, research and development, rearrangement/construction activities, utility/maintenance services, off-spec virgin material, operation of pollution abatement systems, and miscellaneous site support operations. Summaries of GLOBALFOUNDRIES' wastes are found in Section 1.0 and Section 3.2, Chemical and Physical Nature of GLOBALFOUNDRIES' Waste.

2.4.2 Hazardous Waste Management Facility

GLOBALFOUNDRIES' hazardous waste management facility is made up of four storage units. Two of the storage units are container storage areas and two are tank storage systems.

2.4.2.1 Container Storage Areas

The two container storage areas are the waste storage room and the flammable waste storage room located in the Building 974 CDC. These two areas are used to store liquid, solid, and contained gaseous wastes in a variety of containers. GLOBALFOUNDRIES considers the boundaries of these container storage areas, and consequently the area subject to regulation as a RCRA storage facility, to be simply the physical limits of the two rooms.

2.4.2.2 Tank Storage Systems

The two tank storage systems are the outdoor tank farm at the Building 974 CDC and the single tank at Building 963. The CDC tank farm consists of six aboveground 10,000-gallon tanks used to store wastes piped from manufacturing operations. A Transfer Room is located within the CDC building to allow transfer of containerized wastes to these tanks (see Section 4.0).

The General Solvent #3 tank at the CDC Tank Farm has a connection to the biological wastewater treatment plant (BWTP), allowing on-site treatment of selected bulk wastes as needed. There is also a tie-in from the Transfer Room to this piping to the BWTP to allow transfer of containerized wastes directly to the BWTP without an initial transfer to the General Solvent #3 tank. An aspiration system is also tied in to the Transfer Room piping to allow for drummed waste to be sent directly to the BWTP for treatment. This waste piping between the CDC and the BWTP is not currently protected from freezing, so it is not used during the winter months.

GLOBALFOUNDRIES considers the boundaries of these two tank storage systems and, consequently, the area subject to regulation as a RCRA storage facility, to include the tanks (including the area where wastes are loaded for off-site transportation), the piping between the tanks and the BWTP, the CDC Transfer Room, secondary containment systems and all ancillary

equipment (e.g., pumps, valves, and piping) located between the tanks and the various points of generation within the manufacturing buildings. Satellite waste generation and accumulation areas are located in buildings throughout GLOBALFOUNDRIES' facilities. Because these satellite areas accumulate small quantities of hazardous waste that are shipped to the CDC within 3 days of filling a container or are treated as short-term storage areas, they are not part of the regulated RCRA storage facility.

The entire GLOBALFOUNDRIES manufacturing facility and the hazardous waste storage units are shown with a building legend on a topographical map on Figure B-6 (Appendix B).

2.4.3 Wastewater Treatment Facility and Storm Water Discharge

GLOBALFOUNDRIES discharge of treated industrial wastewater and stormwater runoff to the Winooski River are regulated under a National Pollutant Discharge Elimination System (NPDES) permit. Hazardous waste may be treated by the NPDES-permitted wastewater treatment facility through chemical mechanical polishing (CMP) microfiltration, biological treatment, and industrial wastewater treatment. A brief description of the treatment processes follows. Drawings showing a general overview of the drain systems (including stormwater) may be found in Appendix B, Figures B-7, B-8, B-9, B-10, and B-11. Plant effluent water is discharged to the Winooski River under a NPDES permit.

2.4.3.1 Chemical Mechanical Polishing Waste Treatment

Site CMP wastewater is collected and transported to the wastewater treatment facility in a site-wide system of gravity drains, holding tanks, and force mains. CMP wastewater is pumped to three cascading reaction tanks where pH is adjusted and coagulant and polymer are added. The resulting mixture is filtered or settled and then discharged to either the industrial wastewater treatment plant (IWTP) or the biological wastewater treatment plant (BWTP) or both. The sludge resulting from the CMP treatment process is combined with the industrial and biological sludge for disposal.

2.4.3.2 Biological Wastewater Treatment Plant

The three major waste streams treated at the BWTP are concentrated waste (CW), dilute organic waste (DOW), and sanitary waste. Each of the primary waste streams is collected and transferred to the BWTP. Source segregation of the wastes allows use of the biological process (as opposed to off-site treatment) while maintaining the incremental loading within the design limits of the treatment system.

The waste streams amenable to biological treatment are pumped from lift stations throughout the site to two blend tanks at the BWTP. The waste is monitored for temperature, incoming flow, and pH. All three waste streams are mixed and equalized in two blend tanks and then transferred to one of three sequential batch reactors (SBR). The SBR treatment process uses a sequence of reaction

steps to biodegrade chemical and biological components. Decanted liquid from the SBRs is discharged to the head of the industrial wastewater treatment system. Solids from the SBRs are periodically wasted to one of two gravity thickeners.

Concentrated Waste

The concentrated waste stream primarily consists of hydrofluoric acid and ammonia-based process wastewaters. The fluoride in the CW waste is treated by flash mixing with lime slurry in blend tanks to produce calcium fluoride, a solid which precipitates in the treatment system and is accumulated in the sludge. These inorganic wastes are biodegradable and treated by the microorganisms in the BWTP process.

Dilute Organic Waste

The DOW waste stream primarily consists of steam condensate from air emissions control equipment, isopropanol, other organic process waste and rinse water, and high total organic carbon (TOC) waste, including, but not limited to, photolithography waste. Ethylene glycol and propylene glycol solutions may also be treated through this process. Glycol solutions are directed to the BWTP for treatment either from the General Solvent #3 tank or from the CDC transfer room. These organic wastes are biodegradable and treated and consumed by the microorganisms in the BWTP process.

Sanitary Waste

The sanitary waste stream consists of discharges from the site cafeterias and restrooms. Petroleum and water mixtures may also be introduced to the treatment process through this system. In addition, DOW and CW wastes could be transported to the BWTP through the sanitary waste system in the event of an emergency. These typical sanitary wastes are biodegradable and treated by the microorganisms in the BWTP process.

2.4.3.3 Industrial Wastewater Treatment Plant

Site industrial wastewater consists of corrosive and metal-bearing wastes. It is collected and transported to the wastewater treatment facility in a site-wide system of gravity drains, holding tanks, and force mains. The IWTP treatment process consists of a sodium bisulfite pretreatment step to reduce hydrogen peroxide, hexavalent chrome, and chlorine. This is followed by acid and base neutralization, solids precipitation, and a final pH adjustment step.

Sludge resulting from the wastewater treatment facility processes is sent to filter presses for dewatering. The dried sludge is shipped off-site for disposal.

2.4.3.4 Movement of Hazardous Waste to the Wastewater Treatment Facility (including CMP, BWTP, and IWTP)

Liquid hazardous wastes may be trucked to the wastewater treatment facility for introduction to the appropriate part of the treatment process (CMP, BWTP, or IWTP). Containerized wastes may also be transported to the wastewater treatment facility to eliminate extra handling and to facilitate introduction of treatable wastes to the appropriate treatment process (CMP, BWTP, or IWTP).

Containerized wastes transported to the wastewater treatment facility are managed in a way to minimize spills or leakages from reaching the environment. All buildings and roadways within the wastewater treatment facility are considered secondary containment, since they are designed to collect spillage and redirect the material to the head works of the IWTP.

Containerized wastes may also be transferred to the appropriate part of the treatment process through the CDC transfer room, site drain systems, drum wash station in the CDC, etc. on an as-generated basis.

2.4.4 Waste Management for On-site Tenants within the Champlain Valley Technology and Innovation Park

Tenants to GLOBALFOUNDRIES operating within the Champlain Valley Technology and Innovation Park are required to follow all local, state, and federal regulations regarding waste management. Tenants to GLOBALFOUNDRIES operating within the Champlain Valley Technology and Innovation Park are also required to follow the waste characterization requirements specified in Section 3.4 of this permit.

2.4.4.1 On-Site Tenant Waste Management

Tenants are defined as businesses operating on GLOBALFOUNDRIES owned property within the Champlain Valley Technology and Innovation Park, where GLOBALFOUNDRIES serves as a Landlord. Tenant waste may be transferred for storage to the CDC and managed under GLOBALFOUNDRIES hazardous waste permit. Tenant waste may also be sent directly to a permitted offsite disposal facility by the tenant.

If tenant waste is managed at the CDC, the following procedures will be followed:

- Tenant waste in containers will be transported from the tenant location to the CDC, without the use of a manifest, in accordance with the Vermont Hazardous Waste Management Regulations (VHWMR) §7-702(c)(2) manifest exemption for transport on a contiguous piece of property under the control of the same person.
- GLOBALFOUNDRIES will receive the tenant waste in containers at the CDC and handle according to GLOBALFOUNDRIES procedures outlined within this permit. The tenant waste will be stored in GLOBALFOUNDRIES permitted facility under the tenant's EPA ID number. Tenant waste requiring offsite shipment from GLOBALFOUNDRIES permitted facility will be manifested under the tenant's EPA ID number.

- Tenant waste compatible with GLOBALFOUNDRIES bulk waste and consolidated with or connected to GLOBALFOUNDRIES bulk waste tank systems will be combined with GLOBALFOUNDRIES waste and will be managed under GLOBALFOUNDRIES EPA ID number.

Tenants are required to follow the GLOBALFOUNDRIES contingency plan and are provided with a current copy. Tenants are also included on the GLOBALFOUNDRIES facility mailing list to ensure that they are aware of any updates or changes to the contingency plan or other relevant changes to GLOBALFOUNDRIES hazardous waste permit. Any wastewater generated from tenant operations that is managed under GLOBALFOUNDRIES NPDES permit would follow any applicable GLOBALFOUNDRIES procedures. Treatment of tenant wastewater does not impact the wastewater treatment unit exemption found at 40 CFR 264.1(g)(6) and 40 CFR 270.1(c)(2)(v).

2.5 CORRECTIVE ACTIONS

GLOBALFOUNDRIES is responsible for the remediation of and corrective actions for any releases of hazardous material to the environment that occur after the transfer of ownership that occurred on July 1, 2015. IBM Corporation is responsible for the remediation of and corrective actions for all releases that occurred prior to the transfer of ownership that occurred on July 1, 2015 (historical releases); the ownership of the historical corrective action portion of the facility is maintained by IBM Corporation. The property is owned by GLOBALFOUNDRIES however there are two Groundwater remediation discharge points which are permitted to IBM. IBM's corrective action responsibility is documented in State of Vermont Consent Order docket number 620-6-15CNCV. Discharge points related to treated water from IBM's corrective action systems are documented in IBM's NPDES permit # 3-1559. **APPENDIX 2.1 IBM permitted discharge points**, shows the location of the 2 permitted discharge points.