APPENDIX C

BIENNIAL HAZARDOUS WASTE REPORT

AND INTERNATIONAL SHIPMENTS REPORT

2017 HAZARDOUS WASTE REPORT

Cycle	Site Name	Site ID
2017	GLOBALFOUNDRIES US 2 LLC-VERMONT FACILITY	VTR000524868

GM 1 Waste Characteristics

A. Description of hazardous waste

IGNITABLE LIQUID, SPENT COATING/PHOTORESIST FROM SEMICONDUCTOR MANUFACTURING, PROPYLENE GLYCOL METHYL ETHER ACETATE/N-BUTYL ACETATE

B. EPA Hazardous Waste Code(s)

D001

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G06		W203	B	285446.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

	B. EPA ID of facility to which waste was shipped	*C. Management Method Code*	*D. Total Quantity Shipped*
Site 1	NJD002182897	H020	254200.0

Comments

GM 2 Waste Characteristics

A. Description of hazardous waste

SOLID, ARSENIC/PHOSPHORUS DEBRIS - DUCTWORK/PIPING/PARTS

B. EPA Hazardous Waste Code(s)

D001, D003, D004, D007, D008

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G15		W002	X	4177.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

	B. EPA ID of facility to which waste was shipped	*C. Management Method Code*	*D. Total Quantity Shipped*
Site 1	ILD098642424	H040	4591.0

Comments

GM 3 Waste Characteristics

A. Description of hazardous waste

SOLID, CLEAN UP DEBRIS FROM SEMI-CONDUCTOR MANUFACTURING AND LEAD ABATEMENT, TOXIC

B. EPA Hazardous Waste Code(s)

D004, D005, D006, D007, D008, D011

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G19		W002	X	1040.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

	B. EPA ID of facility to which waste was shipped	*C. Management Method Code*	*D. Total Quantity Shipped*
Site 1	OHD093945293	H061	500.0
Site 2	ARD069748192	H040	1602.0

Comments

PROTECTIVE CLOTHING, RAGS, DEBRIS, CONTAMINATED FROM THE REMOVAL OF LEAD PAINT. (WS# 81, 113)

GM 4 Waste Characteristics

A. Description of hazardous waste

SOLID, CARBON FILTERS FROM SEMICONDUCTOR MANUFACTURING, CORROSIVE

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT20

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W310	X	2375.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	2130.0

Comments

REMOVAL OF SPENT MANUFACTURING FILTERS IMPREGNATED WITH CORROSIVE CHEMICALS (WS#377)

GM 5 Waste Characteristics

A. Description of hazardous waste

SOLID, OIL CONTAMINATED MATERIALS FROM UTILITY/MAINTENANCE SERVICES AND SPILL CLEANUP

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT02

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G16		W002	X	621.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	1119.0

Comments

SECTION 1: BOX D- WASTE STREAM MAY ALSO CONTAIN SOURCE CODES G15, G32, G33 (WS#6)

GM 6 Waste Characteristics

A. Description of hazardous waste

FLAMMABLE SOLID, SOLVENT CONTAMINATED FILTERS AND DEBRIS FROM SEMICONDUCTOR MFG, TOXIC

B. EPA Hazardous Waste Code(s)

F003, F005, U002, U031, U057, U079, U080, U154, U159, U161, U210, U211, U220, U226, U228, U239, D001, D004, D005, D006, D007, D008, D010, D011, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D035, D039, D040, D043, F001, F002

C. State Hazardous Waste Code(s)

VT02, VT08

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W409	A	6671.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	6249.0

Comments

G09-CLEANUP & PRODUCTION PROCESS DEBRIS; W409-DEBRIS, FILTERS, ORGANIC SLUDGES, CHEMICAL BLADDERS; WASTE MIN-DECREASE CHEMICAL BLADDERS BY REDUCING CHEMICALS USING THIS TYPE OF PKG (WS#23)

GM 7 Waste Characteristics

A. Description of hazardous waste

LIQUID, ARSENIC COMPOUNDS FROM SEMICONDUCTOR MANUFACTURING, TOXIC

B. EPA Hazardous Waste Code(s)

D007, D008, D004

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W519	X	12791.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	11254.0

Comments

SECTION 1: BOX D - SANDBLASTING OF MANUFACTURING TOOL PARTS, BOX E- SANDBLASTING SLURRY (WS#27)

GM 8 Waste Characteristics

A. Description of hazardous waste

SOLID, PCB BALLASTS AND CAPACITORS

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT01

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G15		W320	X	58.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	TXD055141378	H040	166.0

Comments

WS#35

GM 9 Waste Characteristics

A. Description of hazardous waste

SOLID, SOLVENT CONTAMINATED CLEANUP DEBRIS FROM SEMICONDUCTOR MFG, TOXIC, MIXED SOLVENTS

B. EPA Hazardous Waste Code(s)

D005, D006, D004, D007, D008, D010, D011, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D035, D039, D040, D043, F001, F002, F003, F005, U002, U031, U057, U079, U080, U154, U159, U161, U210, U211, U220, U226, U228, U239

C. State Hazardous Waste Code(s)

VT02, VT08

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W002	A	43402.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	KYD053348108	H040	21795.0
Site 2	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	KYD053348108	H061	22049.0

Comments

G09-CLEANUP DEBRIS, PROTECTIVE CLOTHING, RAGS, WIPES, SPEEDI-DRI; MAY ALSO CONTAIN SOURCE CODE G32; WASTE MIN-SORTING & DECONTAMINATION OF SOLVENT CONTAMINATED PARTS IN ONSITE DECONTAMINATION FACILITY REDUCES HAZ WASTE SENT OFFSITE (WS#39)

GM 10 Waste Characteristics

A. Description of hazardous waste

SOLID, CORROSIVE CLEANUP DEBRIS FROM SEMICONDUCTOR MFG, INORGANIC ACIDS

B. EPA Hazardous Waste Code(s)

D002

C. State Hazardous Waste Code(s)

VT20

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W002	A	214043.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Process System 1	*Management Method Code*	*Quantity*
	H121	198998.0

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	11908.0

Comments

G09-CLEANUP DEBRIS,PROTECTIVE CLOTHING,RAGS,WIPES; MAY ALSO CONTAIN SOURCE CODE G32; WASTE MIN-SORTING & NEUTRALIZATION OF WASTE STREAM IN ONSITE DECONTAMINATION FACILITY SIGNIFICANTLY REDUCES HAZ WASTE SHIPPED OFFSITE (W#40)

GM 11 Waste Characteristics

A. Description of hazardous waste

IGNITABLE LIQUID, SPENT SOLVENT FROM SEMICONDUCTOR MANUFACTURING, ISOPROPANOL/PROPYLENE GLYCOL METHYL ETHER ACETATE

B. EPA Hazardous Waste Code(s)

D001, F003, U161

C. State Hazardous Waste Code(s)

VT08

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G08		W219	B	86274.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	NJD002454544	H061	76460.0

Comments

MAY ALSO CONTAIN SOURCE CODES G09 (RESIDUES FROM EMPTY CONTAINER CLEANING), G21; W219-DILUTE NON-HALOGENATED SOLVENT MIXTURE; WASTE MIN-SOURCE REDUCTION, AT TOOL CHEMICAL RECYCLE, & ONSITE TREATMENT OF IPA AT THE BIOLOGICAL WWTP (WS#41)

GM 12 Waste Characteristics

A. Description of hazardous waste

IGNITABLE LIQUID, MIXED ORGANIC WASTE FROM SEMICONDUCTOR MFG AND MAINTENANCE OPERATIONS

B. EPA Hazardous Waste Code(s)

U154, U159, U161, U210, U211, U220, U226, U228, U239, D001, D004, D005, D006, D007, D008, D009, D010, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D035, D039, D040, D043, F001, F002, F003, F005, U002, U031, U057, U079, U080

C. State Hazardous Waste Code(s)

VT02, VT08

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G08		W219	B	129134.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped* NYD080469935	*C. Management Method Code* H050	*D. Total Quantity Shipped* 70500.0
Site 2	*B. EPA ID of facility to which waste was shipped* NYD080469935	*C. Management Method Code* H040	*D. Total Quantity Shipped* 42020.0

Comments

MAY ALSO INCLUDE SOURCE CODES G11,G13,G15,G16,G21,G22,G42; W219-DILUTE HALOGENATED/NON-HALOGENATED SOLVENT MIXTURE; WASTE STREAM (WS#43)

GM 13 Waste Characteristics

A. Description of hazardous waste

SOLID, SPENT CARBON FROM EMISSIONS CONTROL, TOXIC, SOLVENT CONTAMINATED

B. EPA Hazardous Waste Code(s)

D027, D028, D029, D035, D039, D040, F001, F002, F003, F005, U002, U031, U057, U079, U080, U154, U159, U161, U210, U211, U226, U228, U239, D018, D019, D021, D022, D023, D024, D025, D026

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G21		W310	X	1542.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Comments

WS#96

GM 14 Waste Characteristics

A. Description of hazardous waste

SOLID, BROKEN FLUORESCENT LAMPS, TOXIC

B. EPA Hazardous Waste Code(s)

D008, D006, D009

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G19		W320	B	242.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped* MAC300017498	*C. Management Method Code* H010	*D. Total Quantity Shipped* 309.0

Comments

SECTION 1: BOX D - BROKEN FLUORESCENT LAMPS FOR RECYCLE, BOX G - CONTINUED EXISTING PROGRAM OF SENDING OFF-SITE FOR MERCURY RECLAIM (WS#108)

GM 15 Waste Characteristics

A. Description of hazardous waste

SOLID, INORGANIC SPENT DRY SCRUBBER MEDIA, TOXIC, ARSENIC

B. EPA Hazardous Waste Code(s)

D004, D006, D010, D011

C. State Hazardous Waste Code(s)

VT20

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G21		W316	X	1926.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ILD098642424	H040	1926.0

Comments

(WS#165)

GM 16 Waste Characteristics

A. Description of hazardous waste

SOLID, RESIN FROM SEMICONDUCTOR MANUFACTURING OPERATIONS, CONTAMINATED WITH ETHYLENE GLYCOL

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT08

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W310	X	4426.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	4012.0

Comments

SECTION 1: BOX D - SPENT RESIN REMOVED FROM MANUFACTURING TOOL COOLING UNITS (WS#209B)

GM 17 Waste Characteristics

A. Description of hazardous waste

SOLID, ARSENIC CONTAMINATED DEBRIS FROM EQUIPMENT MAINTENANCE, CONSTRUCTION, AND CLEANUP ACTIVITIES, TOXIC, ARSENIC

B. EPA Hazardous Waste Code(s)

D004, D007, D008

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W002	X	9127.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	9648.0

Comments

SECTION 1: BOX D - REMOVAL OF CONSUMABLE PARTS DURING MANUFACTURING MAINTENANCE ACTIVITIES AND DEBRIS FROM PARTS CLEANING OPERATIONS, WASTE STREAM MAY ALSO CONTAIN SOURCE CODES G15, G33 (WS#366)

GM 18 Waste Characteristics

A. Description of hazardous waste

SOLID, ARSENIC CONTAMINATED DUST COLLECTOR WASTE AND DEBRIS, TOXIC

B. EPA Hazardous Waste Code(s)

D004, D007, D008

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G21		W319	X	9841.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	9233.0

Comments

SECTION 1: BOX E - BAGHOUSE DUST AND PPE (WS#367)

GM 19 Waste Characteristics

A. Description of hazardous waste

SOLID, CONTAMINATED QUARTZ, GRAPHITE, CERAMIC, CORROSIVE

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT20

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W002	X	6870.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	1981.0

Comments

SECTION 1: BOX D - QUARTZ, CERAMIC, GRAPHITE CONTAMINATED WITH CORROSIVE PROCESS GASES (WS#422)

GM 20 Waste Characteristics

A. Description of hazardous waste

LIQUID, SLURRY WITH A LOW PH, CORROSIVE

B. EPA Hazardous Waste Code(s)

D002

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W119	A	20929.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Process System 1	*Management Method Code*	*Quantity*
	H129	20046.0

Off-site Shipment of Hazardous Waste

Comments

G09-ROUTINE MAINTENANCE ON SLURRY SUPPLY SYSTEMS; W119- CORROSIVE SLURRY; WASTE MIN-ONSITE TREATMENT AT WWTP ELIMINATED OFFSITE SHIPMENTS; H129-NEUTRALIZATION & SOLIDS PRECIPITATION IN ONSITE WWTP (WS#427A, 427B, 447) L

GM 21 Waste Characteristics

A. Description of hazardous waste

LIQUID, ETHYLENE/PROPYLENE GLYCOL FROM MAINTENANCE ACTIVITIES, TOXIC

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT08

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G19		W219	A	12853.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Process System 1	*Management Method Code*	*Quantity*
	H081	11676.0

Off-site Shipment of Hazardous Waste

Comments

G19-REMOVAL OF GLYCOL SOL'NS DURING MAINTENANCE OPERATIONS; W219-ETHYLENE GLYCOL & PROPYLENE GLYCOL SOL'NS; WASTE MIN- ONSITE WWTP ELIMINATES OFFSITE SHIPMENTS & USE OF PROPYLENE GLYCOL IN LEIU OF ETHYLENE GLYCOL WHERE FEASIBLE (GS#3)

GM 22 Waste Characteristics

A. Description of hazardous waste

IGNITABLE LIQUID, SPENT COATING/PHOTORESIST FROM SEMICONDUCTOR MANUFACTURING, PROPYLENE GLYCOL METHYL ETHER ACETATE/N-BUTYL ACETATE

B. EPA Hazardous Waste Code(s)

D001, D023, D024, D025, D026

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G06		W203	B	400873.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	NJD002182897	H020	391460.0

Comments

MAY ALSO CONTAIN SOURCE CODES G01, G08, G11; WASTE MIN-WATER FROM BONDER/DEBONDER TOOL IS SEGREGATED FROM SOLVENT WASTE STREAM & TREATED ONSITE AT WWTP. CONTINUED TO SEND THIS WASTE STREAM OFF-SITE FOR SOLVENT RECOVERY.(WS#320 & 476) N

GM 23 Waste Characteristics

A. Description of hazardous waste

LIQUID, FIREFIGHTING FOAM AND WATER, ETHYLENE GLYCOL PFOS/PFOA

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT08

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G19		W113	X	16528.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	30614.0

Comments

SECTION C - FIREFOAM (IN WATER) MATERIAL IS VT HAZARDOUS VT21 AND VT22; THESE CODES ARE NOT AVAILABLE FROM SELECTION WS#420H SECTION D - WASTE IS GENERATED FROM ANNUAL TESTING OF FIRE SUPPRESSION SYSTEM

GM 24 Waste Characteristics

A. Description of hazardous waste

IGNITABLE LIQUID, WASTE PAINT AND PAINT RELATED MATERIALS

B. EPA Hazardous Waste Code(s)

D001, D004, D005, D006, D007, D008, D011, D018, D019, D022, D035, D040, F003, F005

C. State Hazardous Waste Code(s)

VT08, VT02

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G06		W209	X	954.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	954.0

Comments

WS#24

GM 25 Waste Characteristics

A. Description of hazardous waste

IGNITABLE SOLID, WASTE SOLVENT SLUDGE FROM TANK CLEANING, PROPYLENE GLYCOL METHYL ETHER ACETATE

B. EPA Hazardous Waste Code(s)

D004, D005, D001, D006, D007, D008, D010, D011, D018, D019, D021, D022, D023, D024, D025, D026, D027, D028, D029, D035, D039, D040, D043, F001, F002, F003, F005, U002, U031, U057, U079, U080, U154, U159, U161, U210, U211, U220, U226, U228, U239

C. State Hazardous Waste Code(s)

VT08, VT02

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G14		W504	X	1604.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	856.0

Comments

PERIODIC TANK SLUDGE CLEAN OUT FOR TANK INSPECTIONS GENERAL SOLVENT 4, AND DUV

GM 26 Waste Characteristics

A. Description of hazardous waste

SOLID, VACUUM DEBRIS FROM PERIODIC CLEANING, WITH METALS, LEAD TOXIC

B. EPA Hazardous Waste Code(s)

D004, D006, D007, D008, D010, D011

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W002	X	512.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	ARD069748192	H040	512.0

Comments

G09 - CENTRAL HOUSE VACUUM DEBRIS FROM PERIODIC CLEANING, WITH METALS, LEAD TOXIC WS#216

GM 27 Waste Characteristics

A. Description of hazardous waste

SOLID, CLEAN UP DEBRIS FROM SEMI-CONDUCTOR MANUFACTURING AND LEAD PAINT REMOVAL, TOXIC

B. EPA Hazardous Waste Code(s)

D002, D004, D005, D006, D007, D008, D011

C. State Hazardous Waste Code(s)

VT20

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G19		W002	X	470.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Comments

PROTECTIVE CLOTHING, RAGS, DEBRIS, CONTAMINATED FROM THE REMOVAL OF LEAD PAINT. (WS# 89)

GM 28 Waste Characteristics

A. Description of hazardous waste

IGNITABLE LIQUID, LABPACK, WASTE HMDS & OXIDIZERS

B. EPA Hazardous Waste Code(s)

D001, D003

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G19		W001	X	140.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped*	*C. Management Method Code*	*D. Total Quantity Shipped*
	NJD980536593	H040	140.0

Comments

G19 - WASTE GENERATED DURING EQUIPMENT MAINTENANCE AND/OR TOOL REMOVAL- MAY CONTAIN SOURCE CODE G15

GM 29 Waste Characteristics

A. Description of hazardous waste

LIQUID, CORROSIVE INDUSTRIAL AND CONCENTRATED WASTE, AMMONIA, HYDROFLUORIC ACID, SULFURIC ACID, HYDROCHLORIC ACID

B. EPA Hazardous Waste Code(s)

D002

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W119	A	8745.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Process System 1	*Management Method Code*	*Quantity*
	H129	7335.0

Off-site Shipment of Hazardous Waste

Comments

G09- WASTE, AMMONIA, HYDROFLUORIC ACID, SULFURIC ACID, HYDROCHLORIC ACID GENERATED DURING WAFER MANUFACTURE PROCESS (WS #49 & #73)

GM 30 Waste Characteristics

A. Description of hazardous waste

LIQUID, CORROSIVE LABPACK, WASTE DIETHYLENETRIAMINE

B. EPA Hazardous Waste Code(s)

D002

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W001	X	60.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped* NJD980536593	*C. Management Method Code* H040	*D. Total Quantity Shipped* 10.0
Site 2	*B. EPA ID of facility to which waste was shipped* ILD098642424	*C. Management Method Code* H040	*D. Total Quantity Shipped* 50.0

Comments

G09 - WASTE AMINES GENERATED DURING WAFER MANUFACTURE PROCESS, EQUIPMENT MAINTENANCE - MAY CONTAIN SOURCE CODES G15, & G19

GM 31 Waste Characteristics

A. Description of hazardous waste

SOLID, CORROSIVE LABPACK, CORROSIVE GAS SENSORS AND GAUGES

B. EPA Hazardous Waste Code(s)

C. State Hazardous Waste Code(s)

VT20

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W001	X	30.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped* NJD980536593	*C. Management Method Code* H040	*D. Total Quantity Shipped* 30.0

Comments

G09- CORROSIVE CONTAMINATED WASTE GENERATED DURING WAFER MANUFACTURING OR EQUIPMENT MAINTENANCE - MAY ALSO CONTAIN SOURCE CODES G15 & G19

GM 32 Waste Characteristics

A. Description of hazardous waste

IGNITABLE SOLID, LABPACK WASTE AEROSOLS

B. EPA Hazardous Waste Code(s)

D018, D001, D035

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W001	X	95.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped* OHD093945293	*C. Management Method Code* H061	*D. Total Quantity Shipped* 80.0
Site 2	*B. EPA ID of facility to which waste was shipped* OHD093945293	*C. Management Method Code* H039	*D. Total Quantity Shipped* 15.0

Comments

G09- IGNITABLE WASTE GENERATED DURING WAFER MANUFACTURING PROCESS AND EQUIPMENT MAINTENANCE- MAY ALSO CONTAIN SOURCE CODES G15 & G19

GM 33 Waste Characteristics

A. Description of hazardous waste

SOLID, LABPACK WASTE CORROSIVE SOLID ,TOXIC ANTIMONY

B. EPA Hazardous Waste Code(s)

D003

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W001	X	10.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped* ILD098642424	*C. Management Method Code* H040	*D. Total Quantity Shipped* 10.0

Comments

G09-WASTE GENERATED DURING WAFER MANUFACTURING AND EQUIPMENT MAINTENANCE - MAY ALSO CONTAIN SOURCE CODES G13, G15 & G19

GM 34 Waste Characteristics

A. Description of hazardous waste

IGNITABLE SOLID, LABPACK BROKEN GLASS CONTAMINATED WITH SOLVENTS, HEXANE

B. EPA Hazardous Waste Code(s)

D001, F002

C. State Hazardous Waste Code(s)

D. Source Code	*Management Method Code*	*E. Form Code*	*F. Waste Minimization Code*	*G. Quantity*	*UOM*	*Density*
G09		W001	X	40.0	POUNDS	

On-site Generation and Management of Hazardous Waste

Off-site Shipment of Hazardous Waste

Site 1	*B. EPA ID of facility to which waste was shipped* OHD093945293	*C. Management Method Code* H061	*D. Total Quantity Shipped* 40.0

Comments

G09 - WASTE GENERATED DURING WAFER MANUFACTURE PROCESS AND EQUIPMENT MAINTENANCE - MAY CONTAIN SOURCE CODES G15, & G19

GM 35 Waste Characteristics						
A. Description of hazardous waste SOLID, LABPACK WASTE FILTERS WITH CRESOLS						
B. EPA Hazardous Waste Code(s) D024, D025, D023, D026						
C. State Hazardous Waste Code(s)						
D. Source Code G09	*Management Method Code*	*E. Form Code* W001	*F. Waste Minimization Code* X	*G. Quantity* 150.0	*UOM* POUNDS	*Density*
On-site Generation and Management of Hazardous Waste						
Off-site Shipment of Hazardous Waste						
Site 1	*B. EPA ID of facility to which waste was shipped* OHD093945293	*C. Management Method Code* H040	*D. Total Quantity Shipped* 150.0			
Comments						
G09 - WASTE GENERATED DURING WAFER MANUFACTURE PROCESS AND EQUIPMENT MAINTENANCE - MAY CONTAIN SOURCE CODES G15, & G19						

GM 36 Waste Characteristics						
A. Description of hazardous waste SOLID LABPACK, WASTE FILTERS WITH CHROMIUM HEXACARBONYL						
B. EPA Hazardous Waste Code(s) D003, D007						
C. State Hazardous Waste Code(s)						
D. Source Code G09	*Management Method Code*	*E. Form Code* W001	*F. Waste Minimization Code* X	*G. Quantity* 10.0	*UOM* POUNDS	*Density*
On-site Generation and Management of Hazardous Waste						
Off-site Shipment of Hazardous Waste						
Site 1	*B. EPA ID of facility to which waste was shipped* NJD980536593	*C. Management Method Code* H040	*D. Total Quantity Shipped* 10.0			
Comments						
G09 - WASTE GENERATED DURING WAFER MANUFACTURING PROCESS AND EQUIPMENT MAINTENANCE - MAY ALSO CONTAIN SOURCE CODES G15 & G19						

GM 37 Waste Characteristics						
A. Description of hazardous waste IGNITABLE LABPACK, WASTE POLYIMIDE, PROPANE CYLINDERS, COMPRESSED GASES						
B. EPA Hazardous Waste Code(s) D001						
C. State Hazardous Waste Code(s)						
D. Source Code G09	*Management Method Code*	*E. Form Code* W001	*F. Waste Minimization Code* X	*G. Quantity* 665.0	*UOM* POUNDS	*Density*
On-site Generation and Management of Hazardous Waste						
Off-site Shipment of Hazardous Waste						

Site 1	*B. EPA ID of facility to which waste was shipped* NJD980536593	*C. Management Method Code* H040	*D. Total Quantity Shipped* 220.0
Site 2	*B. EPA ID of facility to which waste was shipped* ILD098642424	*C. Management Method Code* H040	*D. Total Quantity Shipped* 195.0
Site 3	*B. EPA ID of facility to which waste was shipped* OHD093945293	*C. Management Method Code* H061	*D. Total Quantity Shipped* 250.0

Comments
G09 - WASTE GENERATED DURING WAFER MANUFACTURING AND EQUIPMENT MAINTENANCE - MAY INCLUDE SOURCE CODES G15 AND G19 INCLUDES WASTE POLYIMIDE SHIPPED FOR FUEL BLENDING

GLOBALFOUNDRIES®

WASTE MINIMIZATION UPDATE

February 28, 2019

This report represents the full calendar year 2018 waste minimization activities.

WASTE MINIMIZATION PROGRAMS AND PROCESSES

GLOBALFOUNDRIES US2 LLC uses the following hierarchy in implementing waste minimization techniques:

1) Source Reduction
2) Reuse (recycling w/o treatment)
3) Recycling (w/treatment)
4) Treatment
5) Land disposal

GLOBALFOUNDRIES Vermont has focused on achieving waste minimization through the implementation and effective management of the following programs and processes, which directly or indirectly aid in minimizing the generation of hazardous waste. These programs and processes are continuously being refined to enhance the site's waste minimization efforts.

- Chemical Authorization Process
    - All chemicals that are new to the site or existing chemicals with a new use are reviewed for environmental and safety impacts. Less toxic substitutes are required when available.
- Process Environmental Impact Assessment
    - All new chemical using manufacturing and facilities equipment are reviewed to identify potential significant impacts to the environment from GLOBALFOUNDRIES processes; to consider feasible alternatives for avoiding potential impacts; and to ensure compliance with applicable legal and regulatory requirements.
- Waste Disposal Characterization
    - The site has a waste disposal process that allows containerized chemical waste to be tracked from the point of generation to the point of disposal. Based on the waste characteristics, the proper disposal method is established, including reuse and recycling when feasible.
- Toxics Use and Hazardous Waste Reduction Planning
    - GLOBALFOUNDRIES Vermont also has a plan identifying source reduction and waste minimization opportunities for all SARA 313 chemicals and hazardous waste streams that fall under the planning requirements, per the requirements of Vermont's ACT 100. Waste minimization efforts are reported to the State of Vermont in the annual Pollution Prevention Progress Report. A new Toxics Use and Hazardous Waste Reduction plan identifying new chemical use reduction and waste minimization opportunities to be evaluated for technical and economic feasibility, a new plan was be submitted to the State of Vermont July 1, 2017. An annual progress report will be submitted on March 31, 2019.
    - GLOBAL FOUNDRIES has a Corporate Environmental Management System (EMS). Its current set of environmental goals covers the range of its environmental programs, including climate protection, energy and water

conservation, pollution prevention, waste management. These goals and objectives are tracked and reported to management periodically, minimum once per year.

- Product Stewardship Program
    - In addition to its processes, GLOBALFOUNDRIES must also ensure that its products do not have a detrimental effect on the environment and that all products are introduced in compliance with Global, Federal, State and Customer GLOBALFOUNDRIES Corporate rules and regulations.

2018 WASTE MINIMIZATION RESULTS

RESTRICTION OF HAZARDOUS SUBSTANCES (ROHS)

GLOBALFOUNDRIES continued its efforts in 2018 on completing remaining qualification of lead-free technologies. All products are now converted to lead free with the exception of a few that need the lead solder use for high end applications for reliability reasons. In 2018 GLOBALFOUNDRIES updated their compliance program to amend requirements per Commission Delegated Directive (EU) 2015/863 for 4 phthalates.

REGISTRATION, EVALUATION, AUTHORIZATION AND RESTRICTION OF CHEMICAL SUBSTANCES (REACH)

GLOBALFOUNDRIES also continued the assessment of the newly proposed REACH Substances of Very High Concern (SVHC) list with regards to impact on GLOBALFOUNDRIES products/packaging. As part of this assessment, GLOBALFOUNDRIES worked with supply chain to ensure new SVHC chemicals in 2018 are not in GLOBALFOUNDRIES products and packaging. Where REACH SVHCs are identified in the supply chain GLOBALFOUNDRIES works with suppliers to assess the feasibility of eliminating any identified SVHC(s) and to develop a plan and schedule for the removal of the substance(s).

CHEMICAL USAGE REDUCTION PROJECTS IN WAFER MANUFACTURING OPERATIONS

CAD-11 elimination in photo lithography

Elimination of DUV Surfactant in the process. Eliminate use of DUV surfactant (CAD-11). Surfactant is used to facilitate wetting of the wafer during the develop process, primarily to reduce developer shot size. Project evaluation was completed in 2016. Full qualification continued through 2017. Chemical savings will be realized in 2018. This project will result in a reduction of chemical use and waste generation of 86 % of the chemical use in this process which equates to 13,500 gals reduction in 2018.

Water Phase from Bonder/Debonder Tool Segregated for On-site Treatment:

Water waste from this tool is segregated from the solvent waste for on-site treatment at the wastewater treatment plant to maximize on-site treatment and minimize the amount of waste being sent off site. This tool was brought online in August 2011. In 2018, 319 pounds/day of water was segregated for on-site treatment. If this water was not treated, it would have been sent offsite for disposal as part of the MUV waste stream. Introducing water to the MUV waste stream can also reduce the reclaim potential for the Propylene Glycol Monomethyl Ether Acetate (PGMEA) in the MUV waste stream.

The chemicals and processes proposed to be used on new tool installations in 2018 were reviewed to see whether any solvent (preferably lower concentrations) containing waste could be routed to the biological wastewater treatment plant for on-site treatment. No new waste streams were identified from solvent using tools for on-site treatment in 2018.

Photochemical Waste Reduction Efforts

A concerted effort is being made to reduce photochemical waste by improved housekeeping and inventory management practices. This is an ongoing effort during the course of the year. The waste minimization results from this ongoing effort cannot be quantified.

PFOA-Related compound reduction in photolithography chemical

From 2017 thru 2018, the Fab 9 photolithography team further focused on qualifying replacements for the PFOA-like chemistries used in Photoresists. The team worked with chemical suppliers to find replacement chemicals (PFAS free or lower Carbon chains), evaluated these substitutes for technical feasibility, and then fully qualified them as a process of record chemical. A total of 11 chemicals containing PFOA-like chemistries were eliminated. This effort reduced the use and waste generation of PFAS chemicals by 5,488 grams in 2018.

RECOVERY OF FOMBLIN OILS USED IN PRECISION VACUUM PUMPS

Segregation of waste perfluorinated oil allows the perfluorinated oil to be recovered and returned to the site for reuse. In 2018, 1,615 pounds of used Fomblin oil were sent for reclaim instead of disposal.

ON-SITE TREATMENT OF WASTE AT WASTEWATER TREATMENT PLANT

The GLOBALFOUNDRIES Vermont manufacturing facility owns and operates a state-of-the-art, NPDES permitted on-site wastewater treatment plant. This wastewater treatment plant consists of four main wastewater treatment processes: Concentrated Wastewater Treatment, Biological Wastewater Treatment, Chemical Mechanical Polish Wastewater Treatment, and Industrial Wastewater Treatment. Utilizing the capabilities of these treatment processes allowed GLOBALFOUNDRIES to treat approximately 51,138 pounds of waste on-site in lieu of sending it off-site for treatment. On-site treatment dramatically reduces the number of waste shipments required, reducing the need for transportation of those wastes.

Table 1 below outlines the types and estimated quantities of waste treated in 2018:

Table 1

Waste Stream Name	***Portion of Treatment Facility Where Treatment Occurred***	***Total Treated (estimated pounds)***	***Percent of Waste Generated***
Ethylene Glycol Solutions	Biological Wastewater Treatment Plant (BWTP)	9,299	100
Miscellaneous Containerized Waste	Chemical Mechanical Polish (CMP) Wastewater Treatment Plant and or BWTP	25,178	100
Miscellaneous Containerized Waste	Industrial WWTP Treatment	14,780	100
	TOTAL =	51,138	

DECONTAMINATION FACILITY OPERATIONS

The GLOBALFOUNDRIES Vermont facility operates a decontamination facility on site. This facility handles the sorting of contaminated as well as non-contaminated trash. The facility processes corrosive and solvent contaminated trash, scrap metal, plastic, and other materials. Contaminated items are cleaned and decontaminated, where applicable, and sorted into the appropriate waste streams. The decontamination facility also segregates metals, high density plastics, computer boards and modules, wood, silicon parts, and other recyclables into the appropriate recycle streams. In addition, the facility has two bottle wash stations for cleaning empty chemical containers and a cleaning process for chemical Nowpak ™ containers.

Decontaminated items leave the facility as recyclable glass, plastic, or metal, or general trash instead of chemical or hazardous waste. In 2018, over 294,859 pounds of waste was decontaminated at this facility.

Table 2 below outlines the types and estimated quantities of waste decontaminated in 2018:

Table 2

Waste Stream Name	***Total Decontaminated (estimated pounds)***
Glass and Plastic Chemical & Nowpak ™ Bottles for Recycle	29,831
Other Plastics for Recycle	4,862
Corrosive Contaminated Trash	126,626
Metal Reclaim (Deconed contaminated metals sent for recycle)	133,540
TOTAL =	294,859

DEEP-ULTRAVIOLET (DUV) AND MID-ULTRAVIOLET (MUV) WASTE STREAMS FOR RECLAMATION

The main constituent in both the DUV and MUV waste streams is Propylene Glycol Monomethyl Ether Acetate (PGMEA). In 2018, the amount of DUV and MUV waste shipped off site was sent for reclaim was 725,440 pounds. The reclaimed PGMEA is used by other companies that can utilize the material at the purity level achieved by reclamation**.**

N- METHYL-2-PYRROLIDONE (NMP) WASTE RECLAMATION

In 2018 all NMP waste was reclaimed and fuel blended for Energy Recovery. The total amount of NMP waste sent for fuel blend in 2018 was 90,200 pounds.

GLASS MASK RECLAIM

Masks are manufactured in the GLOBALFOUNDRIES Vermont mask house and consist of quartz plates covered on one side with a chromium oxy-nitride film. Phase shift masks also have a molybdenum silicide layer. Most used or defective masks have a market value and are shipped to a vendor where they are stripped to bare quartz. Once stripped of their images the glass is purchased by the reclaim vendor for reuse. In 2018, 15,110 pounds of glass masks were sent for reclaim instead of being sent off-site for disposal.

GENERAL SOLVENT #4 WASTE REDUCTIONS

In 2018, 35,180 pounds of waste for off-site shipment for energy recovery.

GENERAL SOLVENT #1 WATER REDUCTIONS

During 2018 the water content in the General Solvent #1 waste stream was reduced to from 88% in 2017 to 3.7% in 2018. The water content reduction allowed for 42,280 pounds of General Solvent 1 waste to be sent off-site for energy recovery instead of disposal.

INDUSTRIAL WASTEWATER TREATMENT PLANT (IWTP) OPTIMIZATIONS

In 2018, there were ongoing efforts regarding data analysis to identify opportunities and optimize treatment. In one successfully identified and implemented project, trends were discovered showing biological treatment efficiency could be improved by adjusting the cycle times in the Sequential Batch Reactors. Adjustments were implemented resulting in a 67% decrease in the instance of Fill-Decant occurrences resulting in more controlled, improved, and optimized biological treatment.

Additional analysis tools were also installed in 2018 with data collection currently in progress. One such tool is a turbidity meter for the collection of data to be analyzed in developing a means for early detection of clarifier blanket disruptions in order to better control total suspended solids.

INDUSTRIAL WASTEWATER TREATMENT PLANT (IWTP) SLUDGE

Although the IWTP sludge falls under the F006 RCRA definition, it meets none of the original listing criteria for F006. Since the sludge is a functionally non-hazardous waste stream, GLOBALFOUNDRIES Vermont worked with EPA Region 1 to pursue a federal delisting of this waste.

Since July 2015, GLOBALFOUNDRIES has shipped the delisted sludge to a Subtitle D landfill where it is used as alternative daily cover, which is considered a beneficial use for the waste material. In 2018 GLOBALFOUNDRIES continued to perform annual sampling and analysis and completed ongoing change evaluations, per the Federal delisting, to monitor the sludge composition and maintain the delisting. In 2018 4,468,440 lbs of the sludge was used as an alternative daily cover versus being sent off-site as hazardous waste for landfill disposal.

OFF SITE SCRAP LEADED WAFER RECYCLE:

GLOBALFOUNDRIES Vermont scrap wafers and wafer pieces, since they contain sensitive information such as defense articles and technical data, fall within unique circumstances where the disposal of this waste must satisfy both the Resource Conservation and Recovery Act (RCRA) regulations and the Arms Export Control Act (AECA). AECA is implemented through the International Traffic in Arms Regulations (ITAR). Previous disposal options were determined in April 2013 to not satisfy specific impairment and destruction requirements as regulated under ITAR. Therefore, GLOBALFOUNDRIES has been evaluating alternatives for recycling or disposal of the scrap wafers that meet all applicable regulations. Under Federal Regulations, there is a broad definition of scrap commercial chemical product that applies to these wafers and exempts them from hazardous waste regulation when reclaimed. The State of Vermont has not adopted this specific exemption, so GLOBALFOUNDRIES is operating under a variance from the Vermont Hazardous Waste Management Regulations (VHWMR) for scrap wafers and wafer pieces containing lead. The variance approval was received by IBM on 01/30/15 and renewed under GLOBALFOUNDRIES 11/25/15. Scrap wafers are no longer considered hazardous waste and are being sent to a certified ITAR destruction facility and then to a lead reclaim facility. In 2018, 2,492 pounds of scrap wafers was sent off-site for reclaim.

WASTE MINIMIZATION PLANS FOR 2019

Actively work through the year in evaluating and implementing economically and technically feasible waste reduction and toxic reduction opportunities on focus chemicals identified in the pollution prevention and waste minimization plans.

SOLVENT AND RESIST DISPENSE VOLUME REDUCTIONS IN PHOTOLITHOGRAPHY OPERATIONS

Optimizing Photochemical Usage:

Photochemical waste returned as partial or full Nowpaks™ will be tracked and evaluated to determine why the chemical was not fully utilized. Chemical usage trends will also be tracked by toolset to identify any areas for improvement. This is an ongoing activity from 2010.

In addition, reduce photochemical waste through source reductions and shelf life extensions. Photochemical waste will be avoided by reducing the number of photo tools on which the variety of photoresists are deployed, thereby reducing the number of wasted partial or full Photoresist extend the shelf life of the photoresists, where it is determined that the chemical quality remains suitable. This will allow these photoresists to be utilized rather than be disposed of as Hazardous Waste.

Shot size reductions for photoresist and solvents in photolithography:

Evaluate reduced shot size for certain photoresists and solvents used in photolithography processes.

Solvent use reduction project:

Reduce 70/30 GBL NBA use in the pre-wet process by using blended solvent process and reducing puddle size. Project evaluation was completed in 2016. Full project implementation expected to occur in 2019. An estimate of chemical use reduction and waste reduction will be calculated after project implementation.

Evaluate strategy for consolidation of Resists and Polyimides in the fabricator:

Reduce the number of resists and polyimides used in manufacturing which have a dual use. This result in reduced tool checks, reduced chemical use and waste generation.

Investigate Bonder/Debonder Process for Chemical Use Optimization:

Investigate chemical use optimization on the bonder/debonder process including PGMEA recirculation and adhesive use reduction:

Bonder/Debonder project elimination on certain set of products:

Currently we do the bond coat and bond clean on one set of products, to protect the front side of the wafer. A new process is being qualified, where we do not use the adhesive coating on these products, so the adhesive will become essentially zero after that new process is qualified. This would reduce adhesive usage (cost savings) as well as 2,900 L of PGMEA per year for the cleans. This project is expected to be fully implemented in 1Q2019.

INVESTIGATE DECON BOTTLE WASH PROCESS/TOOL FOR GREATER ON-SITE TREATMENT

The Biological waste treatment plant currently treats IPA from manufacturing. The biological waste treatment plant might be able to treat some or all of the IPA from the bottle wash facility. Investigation of treating IPA from manufacturing at BWTP was put on hold during 2018. Investigation of treatment of IPA at biological waste treatment will begin in 2019.

PHOTORESIST WASTE SEGREGATION FOR SOLVENT RECOVERY

Continue to investigate the possibility of sending low volumes of drummed photoresist waste containing large amounts of PGMEA solvent for recovery if feasible.

GENERAL SOLVENT 1 WATER REDUCTION PROJECT

Continuation of General Solvent 1 water reduction project waste stream output. The investigation verified high amount of water in General Solvent 1 waste stream. General Solvent output in 2018 was 33,980 pounds less than in 2017. GLOBALFOUNDRIES will continue investigating process controls to better manage the water content and work to reduce General Solvent 1 output throughout 2019.

INDUSTRIAL WASTEWATER TREATMENT PLANT OPTIMIZATION

In 2019, the IWTP plans to focus on the following projects:

- In 2019 the third clarifier will be brought online full-time to treat CMP waste. In the past the 3rd clarifier was mainly used during maintenance projects on one of the other two. This additional retention time for CMP waste will serve to improve treatment efficiencies.

- Continuing work with smart data and collection tools. The focus will be on increasing treatment efficiencies and reducing chemical usage. With better tracking the IW plant will be able to trend and look at chemical use reductions in a smarter fashion.

- Working to maximize planned maintenance shutdown of clarifiers and bypassing the EQ basin to realize electrical, chemical, and sludge generation reductions.

ON-SITE TREATMENT OF SOLVENT, MISCELLANEOUS CONTAINERIZED WASTE STREAMS

Biotreatment of ethylene/propylene glycol will continue in 2019, including continued efforts to determine the maximum practical loading for this waste streams in the BWTP.

Miscellaneous containerized waste treatment through portions of the Industrial Wastewater Treatment Plant (IWTP) and biological waste treatment plant will also continue in 2019 as allowed.

In 2019 GLOBALFOUNDRIES will investigated the feasibility of treating the some or all Deep UV (PGMEA) waste stream at IWTP.

DECONTAMINATION FACILITY OPERATIONS

The decontamination facility will continue to process corrosive and solvent contaminated trash, scrap metal, chemical bottles, high density plastic, and other materials in 2019. In 2019, GLOBALFOUNDRIES plans to continue to improve the efficiency of the decontamination processes and evaluate additional waste streams for addition to the decontamination processes.

In addition, GLOBALFOUNDRIES plans to continue to optimize decontamination of tools and ancillary equipment so they can be sold for re-use or scrap metal recovery.

ANNUAL REPORT OF INTERNATIONAL SHIPMENTS OF HAZARDOUS WASTE

Annual Report of International Shipments of Hazardous Waste
2018 Calendar Year

Vermont Facility
1000 River Road – B966
Essex Junction, VT 05452

February 22, 2019

Office of Enforcement and Compliance Assurance
Office of Federal Activities
International Compliance Assurance Division (2254A)
Environmental Protection Agency
1200 Pennsylvania Ave., NW
Washington, DC 20460

Via UPS Mail and Email

Re: GLOBALFOUNDRIES 2 U.S. LLC Essex Junction, VT (EPA ID No. VTR000524868)

To Whom It May Concern:

There were no international shipments of hazardous waste for the GLOBALFOUNDRIES 2 U.S. LLC Essex Junction Facility, Vermont in 2018. This letter serves as notification as required by 40 CFR 262.83(g) and Section 7-708(c) of the Vermont Hazardous Waste Management Regulations.

If you have any questions please feel free to contact me (Andrea McCullen) at (802) 288-6030 or at *andrea.pomroy-mccullen@globalfoundries.com* with any questions or for further information.

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment.

Sincerely,

Andrew Lacourciere
GlobalFoundries Northeast Regional Environmental Manager

cc: Mr. Marc Roy
Vermont Department of Environmental Conservation
Waste Management Division (via email)

Waste Import Export Tracking System

Home Notices Annual Reporting

Annual Reporting - Home

Start a New Report

Report Year: 2018 Report Name: Start Report

Submitted Reports

- International Shipments Report , 2018 Report, Signed 02/28/2019 (Download)