



Water 2017 Information Request Merck & Co., Inc.

Module: Introduction

Page: W0. Introduction

W0.1

Introduction

Please give a general description and introduction to your organization

Merck & Co., Inc., Kenilworth, New Jersey, U.S.A. is leading global biopharmaceutical company known as MSD outside of the United States and Canada. For more than a century, our company has been inventing for life, bringing forward medicines and vaccines for many of the world's most challenging diseases. Through our prescription medicines, vaccines, biologic therapies and animal health products, we work with customers and operate in more than 140 countries to deliver innovative health solutions. We also demonstrate our commitment to increasing access to health care through far-reaching policies, programs and partnerships. Today, we continue to be at the forefront of research to advance the prevention and treatment of diseases that threaten people and communities around the world - including cancer, cardio-metabolic diseases, emerging animal diseases, Alzheimer's disease and infectious diseases including HIV and Ebola.

Through innovative research, ground breaking partnerships and smarter processes, we are working to advance our performance in four priority areas: Access to Health, Environmental Sustainability, Employees, and Ethics & Transparency. With a focus on these priority areas across our entire organization, we are committed to leading the future of healthcare.

Our core values are driven by a desire to improve life, achieve scientific excellence, operate with the highest standards of integrity, expand access to our products and employ a diverse workforce that values collaboration.

Our corporate responsibility approach is aligned with the company's mission and values and articulates how we see our responsibilities in the areas of access to health, ethical and transparent business practices, environmentally sustainable operations, scientific advancement, employee wellness, and value creation for our shareholders.

In short, corporate responsibility at Merck is a daily commitment and a simple promise that is embedded in our business and informs all of our individual actions.

Merck reported total sales of \$39.8 billion during 2016 with approximately 68,000 employees worldwide as of December 31, 2016. Further information is available at www.merck.com.

W0.2

Reporting year

Please state the start and end date of the year for which you are reporting data

Period for which data is reported

Fri 01 Jan 2016 - Sat 31 Dec 2016

W0.3

Reporting boundary

Please indicate the category that describes the reporting boundary for companies, entities, or groups for which water-related impacts are reported

Companies, entities or groups over which operational control is exercised

W0.4

Exclusions

Are there any geographies, facilities or types of water inputs/outputs within this boundary which are not included in your disclosure?

No

Further Information

Module: Current State

Page: W1. Context

W1.1

Please rate the importance (current and future) of water quality and water quantity to the success of your organization

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital for operations Important	Important Important	Fresh, clean, high-quality water is vital to the manufacture of our pharmaceutical and biological products. It is also an important resource for our external manufacturing partners, as well as our overall supply chain.

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of recycled, brackish and/or produced water available for use			Recycled (cooling) water is used as a primary means for heat removal for many of our manufacturing processes. It serves an important role in our operations and those of our external manufacturing partners, as well as our overall supply chain.

W1.2

For your total operations, please detail which of the following water aspects are regularly measured and monitored and provide an explanation as to why or why not

Water aspect	% of sites/facilities/operations	Please explain
Water withdrawals- total volumes	76-100	Merck collects actual water use, consumption and discharge data for all of our global manufacturing and research sites, plus our large office buildings in order to track usage volumes. Water use for our small offices and leased space is calculated based on employee headcount data and applying standard factors for water use and discharge.
Water withdrawals- volume by sources	76-100	Merck collects actual water use, consumption and discharge data for all of our global manufacturing and research sites, plus our large office buildings in order to track usage volumes. Water use for our small offices and leased space is calculated based on employee headcount data and applying standard factors for water use and discharge.
Water discharges- total volumes	76-100	Merck collects actual water use, consumption and discharge data for all of our global manufacturing and research sites, plus our large office buildings in order to track discharge volumes. Water use for our small offices and leased space is calculated based on employee headcount data and applying standard factors for water use and discharge.
Water discharges- volume by destination	76-100	Merck collects actual water use, consumption and discharge data for all of our global manufacturing and research sites, plus our large office buildings in order to track discharge volumes. Water use for our small offices and leased space is calculated based on employee headcount data and applying standard factors for water use and discharge.
Water discharges- volume by treatment method	76-100	Merck collects actual water use, consumption and discharge data for all of our global manufacturing and research sites, plus our large office buildings in order to track discharge treatment volumes. Water use for our small offices and leased space is calculated based on employee headcount data and applying standard factors for water use and discharge.
Water discharge quality data- quality by standard effluent parameters	26-50	Merck collects actual water use, consumption and discharge data for all of our global manufacturing and research sites, plus our large office buildings in order to track discharge quality data. Water use for our small offices and leased space is calculated based on employee headcount data and applying standard factors for water use and discharge. A subset of Merck facilities collect water discharge quality data as required by regulations.
Water consumption- total volume	76-100	Merck collects actual water use, consumption and discharge data for all of our global manufacturing and research sites, plus our large office buildings in order to track consumption volumes. Water use for our small offices and leased space is calculated based on employee headcount data and applying standard factors for water use and discharge.
Facilities providing fully-functioning WASH services for all workers	76-100	Merck facilities provide fully-functioning WASH services to all workers as these services are deemed critical to the health of employees and to ensure the integrity of our operations. Water withdrawals and discharges used for WASH services are included in the overall totals collected at each site.

W1.2a

Water withdrawals: for the reporting year, please provide total water withdrawal data by source, across your operations

Source	Quantity (megaliters/year)	How does total water withdrawals for this source compare to the last reporting year?	Comment
Fresh surface water	3165	Lower	Manufacturing has been discontinued in certain buildings at some of our sites, reducing overall water withdrawals.
Brackish surface water/seawater	0	Not applicable	
Rainwater	0	Not applicable	
Groundwater - renewable	10371	Lower	Manufacturing has been discontinued in certain buildings at some of our sites, reducing overall water withdrawals.
Groundwater - non-renewable	0	Not applicable	
Produced/process water	0	Not applicable	
Municipal supply	7110	About the same	
Wastewater from another organization	0	Not applicable	
Total	20645	Lower	Lower due to reasons noted above

W1.2b

Water discharges: for the reporting year, please provide total water discharge data by destination, across your operations

Destination	Quantity (megaliters/year)	How does total water discharged to this destination compare to the last reporting year?	Comment
Fresh surface water	10517	Lower	Manufacturing has been discontinued in certain buildings at some of our sites, reducing overall water discharges.
Brackish surface water/seawater	0	Not applicable	
Groundwater	0	Not applicable	
Municipal/industrial wastewater treatment plant	6422	About the same	

Destination	Quantity (megaliters/year)	How does total water discharged to this destination compare to the last reporting year?	Comment
Wastewater for another organization	0	Not applicable	
Total	16939	Lower	Lower due to reasons noted above

W1.2c

Water consumption: for the reporting year, please provide total water consumption data, across your operations

Consumption (megaliters/year)	How does this consumption figure compare to the last reporting year?	Comment
4690	About the same	

W1.3

Do you request your suppliers to report on their water use, risks and/or management?

Yes

W1.3a

Please provide the proportion of suppliers you request to report on their water use, risks and/or management and the proportion of your procurement spend this represents

Proportion of suppliers %	Total procurement spend %	Rationale for this coverage
1-25	1-25	Merck is requesting new suppliers to complete a self-assessment questionnaire to determine if they track their water use, as it is a key input to our manufacturing processes and in materials Merck uses. Suppliers are also asked if they have a water reduction goal in place. This information is being collected in order to determine where potential water risks may be in Merck's supply chain in order to determine potential next steps in Merck's overall water management strategy. If a key supplier's practice is deemed inefficient further engagement is pursued.

W1.4

Has your organization experienced any detrimental impacts related to water in the reporting year?

No

Further Information

Module: Risk Assessment

Page: W2. Procedures and Requirements

W2.1

Does your organization undertake a water-related risk assessment?

Water risks are assessed

W2.2

Please select the options that best describe your procedures with regard to assessing water risks

Risk assessment procedure	Coverage	Scale	Please explain
Water risk assessment undertaken independently of other risk assessments	Direct operations and supply chain	All facilities and some suppliers	All Merck facilities are assessed for water risk. Key external manufacturers and suppliers are also assessed for risk to identify areas of concern and potential engagement opportunities. We currently use the WRI Aqueduct Water Risk Atlas as our primary tool to assess internal and supply chain risk. Our primary focus is on the Aqueduct water risk indicator "Baseline Water Stress."

W2.3

Please state how frequently you undertake water risk assessments, at what geographical scale and how far into the future you consider risks for each assessment

Frequency	Geographic scale	How far into the future are risks considered?	Comment
Annually	Facility	3 to 6 years	
Annually	Business unit	3 to 6 years	

W2.4

Have you evaluated how water risks could affect the success (viability, constraints) of your organization's growth strategy?

Yes, evaluated over the next 5 years

W2.4a

Please explain how your organization evaluated the effects of water risks on the success (viability, constraints) of your organization's growth strategy?

Merck's growth strategy includes an increased proportion of biologics in our overall product portfolio. As biologic processes can be water intensive, Merck's internal focus on "Green and Sustainable Science" includes efforts to reduce water use during process development and operations, for example, designing individual unit operations with water minimization in mind and incorporating single-use manufacturing equipment to reduce cleaning needs and overall environmental impact. Access to water is expected to become even more challenging in many regions of the world in which we operate in the future, therefore we have established a new goal to maintain our 2015 level of water use over the next 10 years, even as we grow our business. We will also identify sites that operate in high water risk areas and implement water stewardship measures at these facilities, as appropriate.

W2.5

Please state the methods used to assess water risks

Method	Please explain how these methods are used in your risk assessment
Internal company knowledge WRI Aqueduct WWF-DEG Water Risk Filter Other: Regulatory surveillance process	Merck uses an Enterprise Risk Management (ERM) process whereby risks are identified by the facilities, corporate functions and business operations. The risks are assessed both quantitatively and qualitatively. Prioritization is based on potential impact and likelihood of occurrence. In this manner, the company's risks are brought together across all operations and the highest risks move forward and are identified in our Annual Report (Form 10-K), section 1.A. Risk Factors. From a water perspective, the corporate environmental group uses the World Resources Institute (WRI) Aqueduct Water Risk Atlas tool, a regulatory surveillance process and internal knowledge to identify both facility specific and corporate level risks. We have also started using the WWF Water Risk Filter as a second source of water risk data. These risks are included as part of the company's ERM process.

W2.6

Which of the following contextual issues are always factored into your organization's water risk assessments?

Issues	Choose option	Please explain
Current water availability and quality parameters at a local level	Relevant, included	Quantity of water used at each manufacturing site is reported annually. Most of our production sites obtain their water supply from local municipal / private water companies.
Current water regulatory frameworks and tariffs at a local level	Relevant, included	Merck considers compliance with all regulations a foundational aspect of doing business. Continued compliance with these regulations is monitored through our regulatory surveillance and internal audit programs as well as self-assessment by site management.
Current stakeholder conflicts concerning water resources at a local level	Relevant, included	Existing or potential stakeholder issues are considered when performing facility level risk assessments.
Current implications of water on your key commodities/raw materials	Relevant, included	The impact of water-related risk on the company's operations and supply chain is considered as part of our overall assessment and includes the potential impacts of climate change. Facility-based supplier water risk assessments have not yet been included.
Current status of ecosystems and habitats at a local level	Relevant, included	Existing or potential issues related to protected habitat and/or endangered species are considered when performing Merck-owned facility level risk assessments.
Current river basin management plans	Relevant, included	Existing or potential risks at the river basin level are evaluated at some of our facilities. Merck complies with all river basin requirements and permits.
Current access to fully-functioning WASH services for all employees	Relevant, included	Merck considers access to water supply, adequate sanitation and hygiene when performing facility level risk assessments.
Estimates of future changes in water availability at a local level	Relevant, included	Merck considers access to water and overall water risk integral to our operations. It is considered for capital investment decisions for water and waste water infrastructure. Therefore, we continually evaluate estimates of future water availability where we operate and will incorporate potential impacts due to climate change and water use changes.
Estimates of future potential regulatory changes at a local level	Relevant, included	Merck tracks and monitors regulatory developments and includes them in facility level risk assessments.
Estimates of future potential stakeholder conflicts at a local level	Relevant, included	Existing or potential stakeholder issues are considered when performing facility level risk assessments.
Estimates of future implications of water on your key commodities/raw materials	Relevant, included	The impact of water related risk on company's operation and supply chain is considered as part of overall assessment and impact of climate change. Facility based supplier water risk assessment has not been included.
Estimates of future potential changes in the status of ecosystems and habitats at a local level	Relevant, included	Existing or potential issues related to protected habitat and/or endangered species are considered when performing Merck-owned facility level risk assessments.
Scenario analysis of availability of sufficient quantity and quality of water relevant for your operations at a local level	Not evaluated	
Scenario analysis of regulatory and/or tariff changes at a local level	Not evaluated	
Scenario analysis of stakeholder conflicts concerning water resources at a local level	Not evaluated	
Scenario analysis of implications of water on your key commodities/raw materials	Not evaluated	
Scenario analysis of potential changes in the status of ecosystems and habitats at a local level	Not evaluated	
Other	Not evaluated	

W2.7

Which of the following stakeholders are always factored into your organization's water risk assessments?

Stakeholder	Choose option	Please explain
Customers	Relevant, included	Impact to customers is a core consideration of Merck's risk assessment process. Water risk is indirectly captured via patient access to medicines and our ability to reliably supply our customers.

Stakeholder	Choose option	Please explain
Employees	Relevant, included	Employees are considered in Merck's risk assessment process via employee health and safety.
Investors	Relevant, included	Investor impact is considered in Merck's risk assessment process. Investor expectations are rising with respect to how companies manage their approach to limited natural resources, like water. Access to water is included in our materiality assessment and goals are set to manage our use and risk.
Local communities	Relevant, included	Local community issues are considered when performing facility level risk assessments.
NGOs	Relevant, included	Merck is currently using the WRI Aqueduct Water Risk tool to assess water risk for internal sites as well as select external manufacturers and key suppliers. We are evaluating other water risk tools from NGOs, such as the WWF Water Risk Filter and the Ecolab Water Risk Monetizer, as they are developed and evolve to determine if they should be included in our risk assessments.
Other water users at a local level	Relevant, not yet included	Merck will engage with other water users at a local level if and when water risks for shared resources develop. We will also engage with other local water users as needed as we pursue our new water risk commitment to develop water management plans at our facilities in high water risk locations.
Regulators	Relevant, included	Merck considers compliance with all local regulations a foundational aspect of doing business. Continued compliance with these regulations is monitored through our internal audit program as well as self-assessment by site management.
River basin management authorities	Relevant, included	Merck follows all requirements established by river basins management authorities. In addition, Merck will engage with river basin management authorities if and when water risks for shared resources develop.
Statutory special interest groups at a local level	Not relevant, included	Merck does not operate in areas governed by statutory special interest groups.
Suppliers	Relevant, included	The impact of water related risk on company's operation and supply chain is considered as part of overall assessment and impact of climate change. Facility based supplier water risk assessment has not been included.
Water utilities at a local level	Relevant, included	We evaluate water supply and wastewater treatment capacity and capability of local municipalities and service providers servicing our sites as part of facility risk assessment.
Other	Not evaluated	

Further Information

Module: Implications

Page: W3. Water Risks

W3.1

Is your organization exposed to water risks, either current and/or future, that could generate a substantive change in your business, operations, revenue or expenditure?

Yes, direct operations and supply chain

W3.2

Please provide details as to how your organization defines substantive change in your business, operations, revenue or expenditure from water risk

Merck's annual report (form 10-K) defines "substantial" risks as those that could materially adversely impact the Company's business, financial condition, results of operations or prospects. Risks that rise to this level are captured and discussed in our 10-K in section 1.A, Risk Factors. For more information see <http://www.merck.com/investors/>

At the facility / supply chain level, "substantial" would be any impact that could disrupt, delay or inhibit the supply of our product to the patients.

W3.2a

Please provide the number of facilities* per river basin exposed to water risks that could generate a substantive change in your business, operations, revenue or expenditure; and the proportion of company-wide facilities this represents

Country	River basin	Number of facilities exposed to water risk	Proportion of company-wide facilities that this represents (%)	Comment
Belgium	Other: Scheldt River Basin	1	1-5	
Brazil	Parana	1	1-5	
Mexico	Panuco	1	1-5	
Puerto Rico	Other: GHAASbasin 1835	1	1-5	
Indonesia	Brantas	1	1-5	
Singapore	Other: Singapore	2	6-10	
United States of America	Susquehanna River	1	1-5	
United States of America	Potomac River	1	1-5	
United States of America	Hudson River	2	1-5	

W3.2b

For each river basin mentioned in W3.2a, please provide the proportion of the company's total financial value that could be affected by water risks

Country	River basin	Financial reporting metric	Proportion of chosen metric that could be affected	Comment
Belgium	Other: Scheldt River Basin	% global production capacity	1-5	
Brazil	Parana	% global production capacity	1-5	

Country	River basin	Financial reporting metric	Proportion of chosen metric that could be affected	Comment
Mexico	Panuco	% global production capacity	1-5	
Puerto Rico	Other: GHAASbasin 1835	% global production capacity	1-5	
Indonesia	Brantas	% global production capacity	1-5	
Singapore	Other: Singapore	% global production capacity	6-10	
United States of America	Susquehanna River	% global production capacity	1-5	
United States of America	Potomac River	% global production capacity	1-5	
United States of America	Hudson River	Other: R&D Hub & Corporate Headquarters.	Less than 1%	

W3.2c

Please list the inherent water risks that could generate a substantive change in your business, operations, revenue or expenditure, the potential impact to your direct operations and the strategies to mitigate them

Country	River basin	Risk driver	Potential impact	Description of potential impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
Belgium	Other: Schelde	Physical-Projected water stress	Higher operating costs	Higher cost of water and associated impact with mandated water use reductions into the permitting process	4-6 years	Probable	Low	Infrastructure investment	Low	Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications. Work with local authorities and invest in wastewater infrastructure to meet internal and external effluent discharge standards. Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications at the request of the regulators. Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications. Work with local authorities and invest in wastewater infrastructure to meet internal and external effluent discharge standards.
Brazil	Parana	Physical-Ecosystem vulnerability	Higher operating costs	Potential higher cost of operations in order to reduce impact on surrounding ecosystem.	4-6 years	Probable	Medium	Infrastructure investment	Low	Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications at the request of the regulators. Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications. Work with local authorities and invest in wastewater infrastructure to meet internal and external effluent discharge standards.
Mexico	Panuco	Physical-Increased water stress	Higher operating costs	Higher cost of water associated impact with mandated water use reductions into the permitting process	4-6 years	Highly probable	Low	Infrastructure investment	Low	Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications at the request of the regulators. Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications. Work with local authorities and invest in wastewater infrastructure to meet internal and external effluent discharge standards.
Puerto Rico	Other: GHAASbasin	Physical-Increased water stress	Higher operating costs	Higher cost of water associated impact with mandated water use reductions into the permitting process	4-6 years	Probable	Low	Infrastructure investment	Low	Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications. Work with local authorities and invest in wastewater infrastructure to meet internal and external effluent discharge standards.
Singapore	Other: Singapore	Regulatory-Regulation of discharge quality/volumes leading to higher compliance costs	Loss of license to operate	Operating permits would not be granted by local authorities	Current-up to 1 year	Probable	Medium	Infrastructure investment	Low-medium	Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications. Work with local authorities and invest in wastewater infrastructure to meet internal and external effluent discharge standards.
United States of America	Susquehanna River	Physical-Flooding	Supply chain disruption	Flood would cause property damage and shut-down operations for a period of time.	4-6 years	Probable	Medium	Other: Management Planning	Low - medium	Our site management and emergency services groups address, plan for, and react to immediate physical risks

Country	River basin	Risk driver	Potential impact	Description of potential impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
United States of America	Potomac River	Physical-Flooding	Supply chain disruption	Flood would cause property damage and shut-down operations for a period of time	4-6 years	Probable	Medium	Other: Management Planning	Low - medium	caused by flooding. Our site management and emergency services groups address, plan for, and react to immediate physical risks caused by flooding. Investment in infrastructure to increase recycle/reuse of grey water in non-potable applications
United States of America	Hudson River	Physical-Increased water stress	Higher operating costs	Higher cost of water supply	4-6 years	Probable	Low	Infrastructure investment	Low	Our site management and emergency services groups address, plan for, and react to immediate physical risks caused by flooding.
Indonesia	Brantas	Physical-Flooding	Supply chain disruption	Flood would cause property damage and shut-down operations for a period of time	4-6 years	Probable	Low	Other: Management Planning	Low - medium	

W3.2d

Please list the inherent water risks that could generate a substantive change in your business operations, revenue or expenditure, the potential impact to your supply chain and the strategies to mitigate them

Country	River basin	Risk driver	Potential impact	Description of potential impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
India	Ganges-Brahmaputra	Physical-Increased water stress	Supply chain disruption	Increased water stress could curtail manufacturing for indirect and key direct suppliers, including external manufacturers.	1-3 years	Probable	Medium	Engagement with suppliers Greater due diligence Other: Data collection strategy	Minimal administrative costs	We have recently revised our Business Partner Code of Conduct to include an expectation of all suppliers to conserve natural resources, quantify the amount of water used in their operations, and reduce their water usage. Merck is also a member of the Pharmaceutical Supply Chain Initiative (PSCI) and adheres to the Pharmaceutical Industry Principles for Responsible Supply Chain Management. Under these principles, suppliers are expected to operate in an environmentally responsible and

Country	River basin	Risk driver	Potential impact	Description of potential impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
India	Krishna	Physical-Increased water stress	Supply chain disruption	Increased water stress could curtail manufacturing for indirect and key direct suppliers, including external manufacturers.	1-3 years	Probable	Medium	Engagement with suppliers Greater due diligence Other: Data collection strategy	Minimal administrative costs	<p>efficient manner to minimize adverse impacts on the environment, including water resources.</p> <p>We have recently revised our Business Partner Code of Conduct to include an expectation of all suppliers to conserve natural resources, quantify the amount of water used in their operations, and reduce their water usage. Merck is also a member of the Pharmaceutical Supply Chain Initiative (PSCI) and adheres to the Pharmaceutical Industry Principles for Responsible Supply Chain Management. Under these principles, suppliers are expected to operate in an environmentally responsible and efficient manner to minimize adverse impacts on the environment, including water resources.</p>
United States of America	Mississippi River	Physical-Increased water stress	Supply chain disruption	Increased water stress could curtail manufacturing for indirect and key direct suppliers, including external manufacturers.	1-3 years	Probable	Medium	Engagement with suppliers Greater due diligence Other: Data collection strategy	Minimal administrative costs	<p>We have recently revised our Business Partner Code of Conduct to include an expectation of all suppliers to conserve natural resources, quantify the amount of water used in their operations, and reduce their water usage. Merck is also a member of the Pharmaceutical Supply Chain Initiative (PSCI) and adheres to the Pharmaceutical Industry Principles for Responsible Supply Chain Management. Under these principles, suppliers are expected to operate in an environmentally responsible and</p>

Country	River basin	Risk driver	Potential impact	Description of potential impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
										efficient manner to minimize adverse impacts on the environment, including water resources.

Further Information

Page: W4. Water Opportunities

W4.1

Does water present strategic, operational or market opportunities that substantively benefit/have the potential to benefit your organization?

Yes

W4.1a

Please describe the opportunities water presents to your organization and your strategies to realize them

Country or region	Opportunity	Strategy to realize opportunity	Estimated timeframe	Comment
United States of America	Cost savings Increased brand value Improved community relations	Reduce once-thru cooling water demand.	Current-up to 1 year	Our Danville, Pennsylvania site in the U.S. completed a water-reduction project that won the Pennsylvania Governor's Award for Environmental Excellence. The project included reducing the use of once-through cooling water, installing an upgraded closed-loop cooling system and fitting cooling water distribution pumps with variable frequency drives. The project has saved approximately 0.7 billion gallons of water over the past two years.
Company-wide	Carbon management	Consideration of water use in energy projects	Current-up to 1 year	Our Energy Center of Excellence includes the total cost of water in energy project evaluations which adds to the economic attractiveness of potential energy conservation and carbon reduction projects.
Singapore	Improved community relations Improved water efficiency	Use reclaimed water from utilities in operations	Current-up to 1 year	A facility in Singapore uses "NEWater" from the public utility company, which is treated, used water that has been reclaimed for non-potable use in industrial and cooling applications.
Company-wide	Cost savings Improved water efficiency	Reuse water through closed-loop systems and reclaiming "reject water"	Current-up to 1 year	Closed-loop cooling systems are employed at more than half our facilities worldwide and reduce our freshwater use by more than 500 million gallons annually. Reverse osmosis (RO) "reject water" is reused for non-potable and non-process applications such as cooling-tower feed water and fire water.
Brazil	Cost savings Increased brand value Improved community relations Improved water efficiency	Reuse of wastewater	Current-up to 1 year	Our site in Campinas, Brazil, is upgrading its on-site industrial wastewater treatment plant. The project will provide for reuse of at least 15,850 gallons per day of treated effluent as make-up water in the site's cooling towers. This corresponds to a site water savings of approximately 5.8 billion gallons per year. This will help ensure sufficient future site water supply in a region that has recently experienced drought conditions.
Company-wide	Collective Action Cost savings Increased brand value Improved community relations Social licence to operate	Work with local organizations to protect water supplies	Current-up to 1 year	• We provided \$100,000 in funding to the Triangle Land Conservancy of North Carolina to enable the completion of the 40-acre Reimer Nature Preserve Expansion Project, which will protect two forested tributaries of the South Fork of the Little River. This project will help protect the local drinking water for the cities of Durham and Raleigh, as well as the water supplied to our manufacturing facility in Durham. This property will also offer habitat for local wildlife and will be used for environmental education. • The Upper Gwynedd Township/Merck Water Quality Partnership (UGMWQP) was formed in 2016 to improve water quality in the Wissahickon, Skippack and Little Neshaminy Creek watersheds located near our facility in Upper Gwynedd, Pennsylvania. Our company provided \$45,000 in funding towards a project to build water retention basins at a local school. In addition to tackling storm water management, the partnership will work to restore natural streams by addressing historical damage caused by urban storm water runoff.
Company-wide	Increased brand value Improved community relations Social licence to operate	Water capital project portfolio to improve site discharge water quality	Current-up to 1 year	Our water capital project portfolio funds improvements to remove pharmaceuticals from site discharge streams, which improves local water quality.

Further Information

Module: Accounting

Page: W5. Facility Level Water Accounting (I)

W5.1

Water withdrawals: for the reporting year, please complete the table below with water accounting data for all facilities included in your answer to W3.2a

Facility reference number	Country	River basin	Facility name	Total water withdrawals (megaliters/year) at this facility	How does the total water withdrawals at this facility compare to the last reporting year?	Please explain
Facility 1	Belgium	Other: Scheidt	Heist	167	About the same	
Facility 2	Brazil	Parana	Campinas	75	Higher	Increased production volume led to increased water use at this site. This increase in water use was offset by reductions elsewhere in the network.
Facility 3	Mexico	Panuco	Xochimilco	52	About the same	
Facility 4	Puerto Rico	Other: GHAASbasin	Las Piedras	151	About the same	
Facility 5	Indonesia	Brantas	Pandaan	39	About the same	
Facility 6	Singapore	Other: Singapore	Singapore South	46	Much lower	Potential over-estimations previously. From Jan 2015 thru July 2015, potable and process water usage was based on estimates. In August 2015, meters were installed which provide more accurate data.
Facility 7	Singapore	Other: Singapore	Singapore West	659	About the same	
Facility 8	United States of America	Susquehanna River	Cherokee	2305	Lower	The main decrease was the result of switching some very large once-through cooling water users to a cooling tower system. The installation of two new cooling tower cells allowed for river water users to be connected to a recycled cooling water system which significantly reduced both surface water withdrawal and discharge from the facility.
Facility 9	United States of America	Potomac River	Elkton	7798	About the same	
Facility 10	United States of America	Hudson River	Kenilworth	748	About the same	
Facility 11	United States of America	Hudson River	Rahway	1117	Lower	The reduction in water withdrawals was largely due to the demolition and/or the shutting down of multiple buildings on site.

Further Information

Page: W5. Facility Level Water Accounting (II)

W5.1a

Water withdrawals: for the reporting year, please provide withdrawal data, in megaliters per year, for the water sources used for all facilities reported in W5.1

Facility reference number	Fresh surface water	Brackish surface water/seawater	Rainwater	Groundwater (renewable)	Groundwater (non-renewable)	Produced/process water	Municipal water	Wastewater from another organization	Comment
Facility 1	0	0	48	0	0	0	120	0	
Facility 2	60	0	0	0.5	0	0	15	0	
Facility 3	0	0	0	0	0	0	52	0	
Facility 4	0	0	29	42	0	0	79	0	
Facility 5	0	0	0	39	0	0	0	0	
Facility 6	0	0	0	0	0	0	46	0	
Facility 7	0	0	0	0	0	0	659	0	
Facility 8	2147	0	80	78	0	0	0	0	
Facility 9	0	0	0	7798	0	0	0	0	
Facility 10	0	0	0	127	0	0	620	0	
Facility 11	0	0	40	182	0	0	896	0	

W5.2

Water discharge: for the reporting year, please complete the table below with water accounting data for all facilities included in your answer to W3.2a

Facility reference number	Total water discharged (megaliters/year) at this facility	How does the total water discharged at this facility compare to the last reporting year?	Please explain
Facility 1	143	About the same	

Facility reference number	Total water discharged (megaliters/year) at this facility	How does the total water discharged at this facility compare to the last reporting year?	Please explain
Facility 2	61	Higher	Increased production volume led to increased water use and discharge at this site. This increase in water use was offset by reductions elsewhere in the network.
Facility 3	46	Higher	This facility manufactures different products at different volumes year-to-year which impacts levels of discharge.
Facility 4	63	About the same	
Facility 5	19	About the same	
Facility 6	47	Much lower	Potential over-estimations previously. From Jan 2015 thru July 2015, potable and process water usage was based on estimates. In August 2015, meters were installed which provide more accurate data.
Facility 7	287	Higher	This facility manufactures different products at different volumes year-to-year which impacts levels of discharge.
Facility 8	2226	Lower	The main decrease was the result of switching some very large once-through cooling water users to a cooling tower system. The installation of two new cooling tower cells allowed for river water users to be connected to a recycled cooling water system which significantly reduced both surface water withdrawal and discharge from the facility.
Facility 9	6482	About the same	
Facility 10	448	About the same	
Facility 11	955	About the same	

W5.2a

Water discharge: for the reporting year, please provide water discharge data, in megaliters per year, by destination for all facilities reported in W5.2

Facility reference number	Fresh surface water	Municipal/industrial wastewater treatment plant	Seawater	Groundwater	Wastewater for another organization	Comment
Facility 1	0	143	0	0	0	
Facility 2	0	61	0	0	0	
Facility 3	0	46	0	0	0	
Facility 4	0	63	0	0	0	
Facility 5	19	0	0	0	0	
Facility 6	1	46	0	0	0	
Facility 7	17	270	0	0	0	
Facility 8	2217	8	0	0	0	
Facility 9	6482	0	0	0	0	
Facility 10	0	448	0	0	0	
Facility 11	0	955	0	0	0	

W5.3

Water consumption: for the reporting year, please provide water consumption data for all facilities reported in W3.2a

Facility reference number	Consumption (megaliters/year)	How does this compare to the last reporting year?	Please explain
Facility 1	24	About the same	
Facility 2	23	Higher	Increased production volume led to increased water consumption at this site.
Facility 3	4	Much lower	This facility manufactures different products at different volumes year-to-year which impacts levels of consumption.
Facility 4	88	About the same	
Facility 5	25	Lower	This facility manufactures different products at different volumes year-to-year which impacts levels of consumption.
Facility 6	0	About the same	
Facility 7	372	About the same	
Facility 8	67	About the same	
Facility 9	1611	About the same	
Facility 10	286	Higher	A well pump leaked during the summer/fall of 2016 (it was subsequently repaired). There was an increase in irrigation in 2016. An increase in site cooling tower usage in 2016 resulted in higher evaporation rates. Dust control was required for the demolition work.
Facility 11	162	Lower	The reduction in water consumption was largely due to the demolition and/or the shutting down of multiple buildings on site.

W5.4

For all facilities reported in W3.2a what proportion of their water accounting data has been externally verified?

Water aspect	% verification	What standard and methodology was used?
Water withdrawals- total volumes	76-100	ISO 14064-3
Water withdrawals- volume by sources	76-100	ISO 14064-3
Water discharges- total volumes	76-100	ISO 14064-3
Water discharges- volume by destination	Not verified	
Water discharges- volume by treatment method	Not verified	
Water discharge quality data- quality by standard effluent parameters	Not verified	
Water consumption- total volume	Not verified	

Further Information

Module: Response

Page: W6. Governance and Strategy

W6.1

Who has the highest level of direct responsibility for water within your organization and how frequently are they briefed?

Highest level of direct responsibility for water issues	Frequency of briefings on water issues	Comment
Board of individuals/Sub-set of the Board or other committee appointed by the Board	Scheduled-annual	The Executive Vice-President and General Council is directly responsible for Merck's water related goals. This position is a direct report of the CEO/Chairman and one of nine (9) Executive Committee members. Progress against goals is measured and reported quarterly.

W6.2

Is water management integrated into your business strategy?

Yes

W6.2a

Please choose the option(s) below that best explains how water has positively influenced your business strategy

Influence of water on business strategy	Please explain
Establishment of sustainability goals	Merck has established water management goals as an integral part of our environmental sustainability strategy. The company included environmental sustainability as one of only four aspects in its corporate responsibility strategy, along with access to medicines, ethics and transparency and employees. The environmental strategy commits Merck to develop a supply chain of partners who share our values related to water and the environment.
Investment in staff/training	Merck created the Environmental Sustainability Center of Excellence (CoE) to better coordinate the efforts undertaken by the company to reduce its environmental impact. The CoE develops and updates the company's environmental sustainability targets, which are then approved by senior management. The CoE works collaboratively with the various divisions to achieve the established goals, and is also responsible for tracking and reporting on progress.
Other:	In 2011, Merck established a \$123 million capital fund to invest in the company's water and wastewater infrastructure with the goal of reducing water demand, improving water quality, strengthening our compliance position, improving operational efficiency and addressing the discharge of active pharmaceutical compounds from our manufacturing plants. To date, over 50 projects have been chartered and \$106 million committed.
Tighter operational performance standards	Merck has in place a Corporate Water Standard which establishes core requirements and expectations for our facilities with regard to water supply, discharge, storm water management, spill control and continuous improvement.

W6.2b

Please choose the option(s) below that best explains how water has negatively influenced your business strategy

Influence of water on business strategy	Please explain
No measurable influence	Water has not negatively influenced Merck's business strategy to date as Merck and our suppliers have been able to secure the water needed for operations. Targeted water reduction projects at our sites have decreased the need for water. As water scarcity is expected to worsen due to population growth, climate change and watershed competition, Merck will continue to monitor water risk for our operations and those of our suppliers.

W6.3

Does your organization have a water policy that sets out clear goals and guidelines for action?

Yes

W6.3a

Please select the content that best describes your water policy (tick all that apply)

Content	Please explain why this content is included
Publicly available	
Company-wide	
Performance standards for direct operations	Merck's approach to Environment, Health and Safety (EHS) is guided by one simple principle – We demonstrate respect and care for the health and well-being of people and the environment in everything we do. Water is critical to the health of people, the planet and our business. We are committed to achieving sustainable water management within our operations and our supply chain, and, through our core business, partnerships, advocacy and employees, to reduce the impact of water-borne illness globally as part of our overall efforts to improve global health
Incorporated within group environmental, sustainability or EHS policy	

W6.4

How does your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) during the most recent reporting year compare to the previous reporting year?

Water CAPEX (+/- % change)	Water OPEX (+/- % change)	Motivation for these changes
+267	0	Merck spent approximately \$11 million in 2016 as part of an overall \$123 million commitment to water infrastructure improvements, which is more than the amount spent in 2015. Operational expense related to water are negligible related to our total materials and production spending in 2016.

Further Information

Page: W7. Compliance

W7.1

Was your organization subject to any penalties, fines and/or enforcement orders for breaches of abstraction licenses, discharge consents or other water and wastewater related regulations in the reporting year?

Yes, not significant

W7.1a

Please describe the penalties, fines and/or enforcement orders for breaches of abstraction licenses, discharge consents or other water and wastewater related regulations and your plans for resolving them

Facility name	Incident	Incident description	Frequency of occurrence in reporting year	Financial impact	Currency	Incident resolution
Rahway, NJ	Penalty	Settlement agreement from NJDEP regarding the RY Site Stormwater permit exceedances incurred from September 2015 to February 2016 (exceedances in daily/monthly max for DDD,DDT, Zinc, and TSS).	2	19000	USD(\$)	The settlement agreement issued addressed all of the permit exceedances.

W7.1b

What proportion of your total facilities/operations are associated with the incidents listed in W7.1a?

1%

W7.1c

Please indicate the total financial impacts of all incidents reported in W7.1a as a proportion of total operating expenditure (OPEX) for the reporting year. Please also provide a comparison of this proportion compared to the previous reporting year

Impact as % of OPEX	Comparison to last year
0.01	Higher

Further Information

Page: W8. Targets and Initiatives

W8.1

Do you have any company wide targets (quantitative) or goals (qualitative) related to water?

Yes, targets and goals

W8.1a

Please complete the following table with information on company wide quantitative targets (ongoing or reached completion during the reporting period) and an indication of progress made

Category of target	Motivation	Description of target	Quantitative unit of measurement	Base-line year	Target year	Proportion of target achieved, % value
Absolute reduction of water withdrawals	Water stewardship	By 2025, we will maintain global water use at or below 2015 levels.	Other: Water from all sources	2015	2025	100%

W8.1b

Please describe any company wide qualitative goals (ongoing or reached completion during the reporting period) and your progress in achieving these

Goal	Motivation	Description of goal	Progress
Engagement with suppliers to help them improve water stewardship	Water stewardship	By 2018, we will collect water use data from > 90% of our strategic suppliers with the highest environmental impact. By 2020, we will engage with those suppliers and request them to identify water use reduction opportunities. By 2025, > 90% of our strategic suppliers with the highest environmental impacts will set their own water use reduction targets.	Merck initiated a Supply Chain Sustainability program within Procurement in late 2016, which will be responsible for our supply chain sustainability goals. In addition, we have modeled our supply chain water impacts, allowing us to see which suppliers have the highest direct impacts. Merck is also a member of the Pharmaceutical Supply Chain Initiative (PSCI), which is developing a path forward in 2017 for its members to collect environmental sustainability data.
Other: Implement water conservation	Water stewardship	By 2020, we will develop water conservation plans for sites in "high water risk" locations	We have identified 10-15 internal sites that potentially operate in areas of high water risk. We are engaging those sites in 2017 to better understand local water stress and local community demands.

Goal	Motivation	Description of goal	Progress
plans at selected sites			We will develop site-specific water management plans at facilities where we determine they are necessary.

Further Information

In 2016, the decreased demand across our manufacturing network resulted in a water-use reduction of 3083 megaliters from 2015, which reflects a 13% drop in water use. We are 100% on track to achieve our 2025 target of maintaining water use at 2015 levels.

Module: Linkages/Tradeoff

Page: W9. Managing trade-offs between water and other environmental issues

W9.1

Has your organization identified any linkages or trade-offs between water and other environmental issues in its value chain?

Yes

W9.1a

Please describe the linkages or trade-offs and the related management policy or action

Environmental issues	Linkage or trade-off	Policy or action
Energy use	Linkage	Reducing water use at our facilities can also mean a reduction in energy use and associated greenhouse gas emissions, another Merck environmental target. A significant energy and water use reduction capital project, representing a \$7.4 million investment, was recently executed at the Merck Cherokee plant, located in Riverside, PA. The project resulted in an annual electrical energy use reduction of approximately 6.5 million Kilo-Watt hours in addition to a 60% reduction in site water use.

Further Information**Module: Sign Off**

Page: Sign Off

W10.1

Please provide the following information for the person that has signed off (approved) your CDP water response

Name	Job title	Corresponding job category
Danielle Menture	Vice President, Global Safety and the Environment	Environment/Sustainability manager

W10.2

Please indicate that your organization agrees for CDP to transfer your publicly disclosed data regarding your response strategies to the CEO Water Mandate Water Action Hub.

Note: Only your responses to W1.4a (response to impacts) and W3.2c&d (response to risks) will be shared and then reviewed as a potential collective action project for inclusion on the WAH website.

By selecting Yes, you agree that CDP may also share the email address of your registered CDP user with the CEO Water Mandate. This will allow the Hub administrator to alert your company if its response data includes a project of potential interest to other parties using water resources in the geographies in which you operate. The Hub will publish the project with the associated contact details. Your company will be provided with a secure log-in allowing it to amend the project profile and contact details.

No

Further Information

CDP: [D] [-] [D2]