AECI Ltd Ord - Water Security 2019

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

AECI is a diversified Group of 17 companies. It has regional and international businesses in Africa, Europe, South East Asia, North America, South America and Australia. Products and services are provided to a broad spectrum of customers in the mining, water treatment, plant and animal health, food and beverage, infrastructure and general industrial sectors.

The Group's strategy is to be the supplier of choice in the markets in which it operates and to continue to grow domestically as well as through ongoing expansion of its footprint within the geographies and markets served. In line with this strategy, businesses are managed in five growth pillars: Mining Solutions (AEL Intelligent Blasting, Experse and Senmin), Water & Process (ImproChem), Plant & Animal Health (Nulandis and Schirm), Food & Beverage (Lake Foods and Southern Canned Products), and Chemicals (Chemfit, Chemical Initiatives, ChemSystems, Industrial Oleochemical Products, Much Asphalt and SANS Technical Fibers). Included in this pillar are two joint ventures — Crest Chemicals and Specialty Minerals South Africa.

These pillars are AECI's key reporting segments.

AECI also has a property division, Acacia Real Estate. Its main activities are the management of the Company's leasing portfolio and the provision of services at the Umbogintwini Industrial Complex in KwaZulu-Natal. Together with Head Office support functions, including the treasury, Acacia Real Estate constitutes the Group's sixth reporting segment, namely Property & Corporate.

All business activities are underpinned by the Group's BIGGER values — of being Bold, Innovative, Going Green and being Engaged and Responsible.

MINING SOLUTIONS

These businesses provide a mine-to-mineral solution for the mining sector internationally. The offering includes surfactants for explosives manufacture, commercial explosives, initiating systems and blasting services right through the value chain to chemicals for ore beneficiation and tailings treatment.

WATER & PROCESS

ImproChem provides integrated water treatment and process chemicals, and equipment solutions, for a diverse range of applications in Africa. These include, inter alia, public and industrial water, desalination and utilities.

PLANT & ANIMAL HEALTH

Nulandis manufactures and supplies an extensive range of crop protection products, plant nutrients and services for the agricultural sector in Africa.

Schirm, based in Germany, is a contract manu-facturer of agrochemicals and fine chemicals with a European and US footprint. It is the largest provider of external agrochemical formulation services in Europe.

FOOD & BEVERAGE

The businesses in this pillar supply ingredients and commodities to the dairy, beverage, wine, meat, bakery, health and nutrition industries.

The other main activity is the manufacture and distribution of a broad range of juice-based products and drinks, including formulated com-pounds, fruit concentrate blends and emulsions.

CHEMICALS

AECI's Chemicals businesses supply chemical raw materials and related services for use across a broad spectrum of customers in the manufacturing, infrastructure and general industrial sectors, mainly in South Africa and in other Southern African countries. SANS Technical Fibers is based in the USA.

AECI was registered as a company in South Africa in 1924 and has been listed on the JSE since 1966. At the end of 2018 its market capitalisation was R10,2 billion and it had 8 038 employees.

AECI understands the importance of effectively managing water use and providing customers with products and services that allow them to do likewise. With this in mind, AECI introduced the Going Green Programme which focuses on both water efficiency and green chemistry. It revised this Programme during the reporting year and also introduced a target to reduce water consumption per tonne production by 10% from a 2018 baseline by 2025. In spite of the introduction of water efficiency initiatives this year, AECI's water withdrawals increased from 2 945.91 ML in the 2017 financial year to 3 347.00 ML in the 2018 financial year owing to the acquisition of Schirm and Much Asphalt.

Not only is AECI focused on reducing its own water withdrawals, but it also offers products and services which allows its customers to do the same. One example of this is ImproChem. ImproChem offers water, wastewater and process water solutions for customers across the spectrum of industries. ImproChem has an established footprint in Africa, where water remains a scarce resource. Other examples include offerings by Nulandis and its Biocult division, which allow farmers to reduce water consumption and ensure crops are more resilient to water-related risks.

There have been no changes to the reporting period. AECI continues to report in line with its financial year-end reportings. Please note that we have included information for Schirm and Much Asphalt for the first time this year since the acquisitions of both these businesses took effect in the 2018 financial year.

W-CH0.1a

(W-CH0.1a) Which activities in the chemical sector does your organization engage in?

Bulk organic chemicals
Bulk inorganic chemicals
Specialty organic chemicals
Specialty inorganic chemicals

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1 2018	December 31 2018

W0.3

(W0.3) Select the countries/regions for which you will be supplying data.

Australia
Botswana
Burkina Faso
Congo
Germany
Ghana
Guinea
Indonesia
Mali
Namibia
Senegal
South Africa
United Republic of Tanzania
United States of America
Zambia
Zimbabwe

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

ZAR

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which financial control is exercised

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Important	Direct use - Good quality freshwater is used at all manufacturing facilities within the Group. As such, we have selected 'vital.' AEL Modderfontein, for example, is the most significant water user within the Group. It uses water in the manufacture of Nitric Acid and Ammonium Nitrate Solution. An absence of sufficient amounts of freshwater could impact on production. It is expected that freshwater will always be critical to our operations. However, we may see a reduced dependency on freshwater as we continue to look for areas of efficiency. Indirect use – For some of our suppliers and customers, having sufficient amounts of good quality freshwater is vital. Freshwater is used in the manufacturing processes for some of our suppliers and customers. We have selected 'important' as the rating as our suppliers and customers are not all equally reliant on freshwater. It is expected that freshwater will always be critical to some of our suppliers and customers.
Sufficient amounts of recycled, brackish and/or produced water available for use	Neutral	Neutral	Group operations do not use significant volumes of recycled, brackish and/or produced water. As such, the direct use importance rating has been selected as 'neutral.' This may change based on future water dependency especially in areas that are water scarce, such as the Western Cape. Our dependency on recycled water may increase with more of our businesses implementing water reuse and recycling projects. An example is AEL Modderfontein where recycled water was used in place of potable water in processes. Indirect use – Many of our suppliers and customers do not necessarily use recycled or brackish water at this stage. As such, we have selected 'neutral' as the rating. Going forward, we expect the dependency of our suppliers and customers on recycled and brackish water to increase as they look for alternatives to freshwater supply. In the 2018 financial year, for example, ImproChem installed and secured service contracts for four desalination plants.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	Water withdrawals are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%). Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also checked against municipal invoices on a monthly-basis and are independently verified. Information is reported internally and to the regulating authorities on a monthly and annual-basis where required.
Water withdrawals – volumes from water stressed areas	100%	Water-stressed areas are identified through the use of WRI Aqueduct and also internal company knowledge. Water withdrawals are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%). This is done for all withdrawals, including those withdrawn from water stressed areas. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also checked against municipal invoices on a monthly-basis and are independently verified. Information is reported internally and to the regulating authorities on a monthly and annual-basis where required.
Water withdrawals – volumes by source	100%	Water withdrawals are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%). This is done for all sources of water. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also checked against municipal invoices on a monthly-basis and are independently verified. Information is reported internally and to the regulating authorities on a monthly and annual-basis where required.
Entrained water associated with your metals & mining sector activities - total volumes [only metals and mining sectors]	<Not Applicable>	<Not Applicable>
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	<Not Applicable>	<Not Applicable>
Water withdrawals quality	100%	This is measured and monitored for all facilities (100%) that withdraw water from freshwater resources. It is not measured and monitored for withdrawals from the municipalities. This applies to the Property Business that withdraws water from a river. The water quality is monitored by an accredited laboratory on a daily-basis. This information allows adjustments to be made to water treatment if required.
Water discharges – total volumes	100%	Discharges are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%) that have discharges. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also compared against municipal invoices on a monthly-basis. Information is reported internally and to authorities on a monthly and annual-basis where required.
Water discharges – volumes by destination	100%	Discharges are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%) that have discharges. The destination of the discharges is known and discharges are measured and monitored by destination. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also compared against municipal invoices on a monthly-basis. Information is reported internally and to authorities on a monthly and annual-basis where required.
Water discharges – volumes by treatment method	100%	Discharges are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%) that have discharges. The treatment method of the discharges is known by destination and discharges are measured and monitored by destination. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also compared against municipal invoices on a monthly-basis. Information is reported internally and to authorities on a monthly and annual-basis where required.
Water discharge quality – by standard effluent parameters	100%	This is measured and monitored for all facilities (100%) that have discharges. Water discharge quality is analysed by accredited laboratories on a daily or weekly-basis and reported to the regulating authorities on a monthly and annual-basis where required. Analyses conducted internally are compared to analyses conducted by the regulating authorities.
Water discharge quality – temperature	Not relevant	This is not relevant to our businesses.
Water consumption – total volume	100%	Given the complexity of measuring water consumption, it is not always directly measured. Most of our operations calculate consumption from a water balance using withdrawals and discharges. All our water withdrawals and discharges are measured regularly, monitored and reported to AECI Head Office by each facility. As such, consumption is regularly measured and monitored as a result.
Water recycled/reused	76-99	This is monitored at some businesses where water is reused or recycled (75%-100%). Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. This information is not always reported to and consolidated at AECI Head Office. We will put in place a process to do so going forward.
The provision of fully-functioning, safely managed WASH services to all workers	100%	The importance of providing potable water, adequate sanitation and hygiene for all employees is recognised. All facilities ensure the availability of fully-functioning WASH services for employees. Although not metered by any specific equipment, it is monitored regularly by all of our facilities (100%) to ensure that there are no interruptions to the provision of potable water and adequate sanitation.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	3347	Higher	Water withdrawals are measured regularly, monitored and reported monthly to AECI Head Office by all facilities. Monitoring is conducted at a facility level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Water withdrawals by the Group's operations increased by 13.6%, from 2 945.91 ML in 2017 financial year to 3 347.00 ML in the 2018 financial year, owing mainly to the acquisition of Schirm and Much Asphalt this year. It is expected that volumes will reduce in future given that water optimisation projects are being implemented at certain facilities in the next 5 to 10 years. Examples in the reporting year include – • Recycling of water from the wash bay at a Crest Chemicals facility; and • Use of recycled water instead of potable water in processes at AEL Modderfontein. For all responses, we have used the following rating scale – • "Much lower" pertains to data of decreasing trend which has a difference of 20% or more from the preceding financial years' data. • "Lower" pertains to data of decreasing trend which has a difference of more than 1% and less than 20% from the preceding financial years' data. • "About the same" pertains to data which has no difference or a difference of less than 1% from the preceding financial years' data. • "Higher" pertains to data of increasing trend which has a difference of more than 1% and less than 20% from the preceding financial years' data. • "Much higher" pertains to data of increasing trend which has a difference of 20% or more from the preceding financial years' data.
Total discharges	2362	Lower	Discharges are monitored by all facilities that have discharges. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Discharges by the Group's operations decreased by 17.82%, from 2 874.09 ML in 2017 financial year to 2 362.00 ML in the 2018 financial year. This is mostly due to improved reporting and the implementation of a number of projects aimed at reducing our discharges. Going forward, we anticipate further reductions in discharges given that water optimisation and effluent reduction projects are being implemented at certain facilities in the next 5 to 10 years.
Total consumption	985	Much higher	Consumption is calculated using a water balance as it is difficult to directly measure consumption. It is assumed that the difference between total water withdrawals and total discharges equals total water consumption. The number is higher due to increased withdrawals from the inclusion of Schirm and Much Asphalt in the 2018 financial year. Going forward, we anticipate that our consumption will reduce given that water optimisation projects are being implemented at certain facilities in the next 5 to 10 years.

W1.2d

(W1.2d) Provide the proportion of your total withdrawals sourced from water stressed areas.

	% withdrawn from stressed areas	Comparison with previous reporting year	Identification tool	Please explain
Row 1	25	About the same	WRI Aqueduct	We use WRI Aqueduct and internal company knowledge to identify water stressed areas from which we source water. In terms of WRI Aqueduct, we use various indicators to classify areas as water stressed. This includes inter-annual variability, flood occurrence, drought severity and regulatory risks. We also use internal company knowledge which is informed by the assessment and monitoring of the broader context in which the Group operates in terms of the political and economic landscape, industry, labour and financial market trends. Work includes the analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk. We also look at how water-intensive operations located in these areas are and what mitigation measures are in place to protect against water-related risks.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	871.64	Higher	Water withdrawals are measured regularly, monitored and reported monthly to AECI Head Office by all facilities. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. The source of fresh surface water is a river for the Property Pillar. The volume withdrawn is 12% higher than in the previous year due to an increase in production by Chemical Initiatives. It is anticipated that water withdrawals from fresh surface water will reduce going forward as we look for alternative water sources and also focus on optimising our water usage.
Brackish surface water/Seawater	Not relevant	<Not Applicable>	<Not Applicable>	Not applicable as none of our businesses withdraw any brackish surface water or seawater for use in operations. This is not anticipated to change going forward.
Groundwater – renewable	Relevant	38.84	Higher	Water withdrawals are measured regularly, monitored and reported monthly to AECI Head Office by all facilities. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Renewable groundwater is used by AEL companies in locations outside of South Africa. It is also used by Much Asphalt. There was a 2% increase in withdrawals of renewable groundwater between the 2017 and 2018 financial year. This was due to the acquisition of Much Asphalt in the 2018 financial year. Going forward, there may be an increase in water withdrawn from groundwater (renewable) sources as we look at ways to alleviate pressure on the municipal water networks.
Groundwater – non-renewable	Not relevant	<Not Applicable>	<Not Applicable>	Not applicable as none of our businesses withdraw water from non-renewable groundwater sources. This is not anticipated to change going forward.
Produced/Entrained water	Not relevant	<Not Applicable>	<Not Applicable>	Not applicable as none of our businesses make use of produced water. This is not anticipated to change going forward.
Third party sources	Relevant	2436.52	Higher	This refers to water obtained from the municipality and from other organisations. Water withdrawals are measured regularly, monitored and reported monthly to AECI Head Office by all facilities. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. In spite of the implementation of water efficiency initiatives, there was a 14% increase in withdrawals from third parties due to the acquisition of Schirm in 2018. We anticipate that this will reduce further going forward as we continue to implement water efficiency initiatives.

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	938.5	Lower	Discharges are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%) that have discharges. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also compared against municipal invoices on a monthly-basis. Information is reported internally and to authorities on a monthly and annual-basis where required. Water discharged to fresh surface water refers to effluent discharged to a river course under a Water Use Licence (WUL) for the AEL Modderfontein facility. Discharges to freshwater decreased by 3.44% this year, from 971.89 ML to 938.50 ML. The decrease can be attributed to improved reporting and the implementation of effluent reduction initiatives that reduced effluent discharged to surface water by AEL Modderfontein. Going forward, we anticipate that our discharges will reduce as we continue to implement effluent treatment projects.
Brackish surface water/seawater	Relevant	20.99	Lower	This refers to discharge to sea from our Property business. Monitoring is conducted at on a daily-basis using equipment that is calibrated and checked on a regular-basis. Discharges decreased by 7.93%, from 22.80 ML in the 2017 financial year to 20.99 ML in the 2018 financial year. The decrease was due to changes in the make-up of tenants operating within the complex and also the implementation of an effluent reduction initiative by one of our tenants. Our discharges are dependent on the discharges from tenants. As such, it is difficult to forecast discharges going forward as we have limited control over volumes discharged. However, we expect to see a reduction going forward as our tenants focus on reducing withdrawals and associated discharges.
Groundwater	Not relevant	<Not Applicable>	<Not Applicable>	There is no discharge to groundwater. This is not anticipated to change going forward.
Third-party destinations	Relevant	1402.51	Much lower	This refers to effluent discharged to a municipal sewer. Discharges are measured regularly, monitored and reported monthly to AECI Head Office by all facilities (100%) that have discharges. Monitoring is conducted at a facility-level on a daily-basis using equipment that is calibrated and checked on a regular-basis. Readings are also compared against municipal invoices on a monthly-basis. Information is reported internally and to authorities on a monthly and annual-basis where required. Discharges to municipal treatment plants decreased by 25.37%, from 1 879.40 ML to 1 402.51 ML in 2018 financial year. This was mostly due to efforts to reduce effluent made by our operations and improved reporting. We anticipate a reduction in discharges going forward as we continue to implement effluent treatment projects and look at ways to reuse and recycle water.

W1.2j

(W1.2j) What proportion of your total water use do you recycle or reuse?

	% recycled and reused	Comparison with previous reporting year	Please explain
Row 1	1-10	About the same	Please note that not all of our businesses report to AECI Head Office on water reused and recycled. We will request that this is reported going forward. We anticipate that water reused and recycled will increase in the future as efforts are put in place to optimise our water usage. Examples of initiatives implemented this year include recycling of water from the wash bay at a Crest Chemicals facility and use of recycled water instead of potable water in processes at AEL Modderfontein. The percentage reported was estimated by the number of facilities who recycle water and report on it. Currently only one facility reports its recycled water.

W-CH1.3

(W-CH1.3) Do you calculate water intensity for your activities in the chemical sector?

Yes

W-CH1.3a

(W-CH1.3a) For your top five products by production weight/volume, provide the following water intensity information associated with your activities in the chemical sector.

Product type
Specialty inorganic chemicals

Product name
Sulphuric acid

Water intensity value (m3)
2.52

Numerator: water aspect
Total water withdrawals

Denominator: unit of production
Ton

Comparison with previous reporting year
Lower

Please explain
Sulphuric acid is manufactured by Chemical Initiatives (part of the Chemicals Pillar) and supplied to a diverse range of customers. Water intensity is calculated by dividing the volume of water withdrawn by Chemical Initiatives with the tonnes of sulphuric acid produced. Water intensity is monitored at a business level to track costs; i.e. to identify areas of poor efficiencies and put in place measures to achieve optimal efficiencies. The water intensity associated with sulphuric acid production decreased by 1.11% between the 2017 and 2018 financial years. This is most likely associated with production-related efficiencies. We anticipate further decreases going forward as Chemical Initiatives continues to look at ways of reducing its water withdrawals.

Product type
Specialty inorganic chemicals

Product name
Nitric Acid

Water intensity value (m3)
6.14

Numerator: water aspect
Total water withdrawals

Denominator: unit of production
Ton

Comparison with previous reporting year
Lower

Please explain
Nitric acid is manufactured by AEL (part of the Mining & Solutions Pillar) and is used to then manufacture explosives for the mining sector. Water intensity is calculated by dividing the total volume of water withdrawn for AEL by the tonnes of nitric acid produced. Water intensity is monitored at a the AEL Modderfontein facility level to identify areas of poor efficiencies and put in place measures to achieve optimal efficiencies. The water intensity associated with nitric acid production increased by 2.22% between the 2017 and 2018 financial years. This is mostly due to improved reporting. We anticipate decreases going forward as AEL Modderfontein continues to focus on reducing its water withdrawals.

Product type
Specialty inorganic chemicals

Product name
Flocculants, frothers, collectors, depressors

Water intensity value (m3)
1.6

Numerator: water aspect
Total water withdrawals

Denominator: unit of production
Ton

Comparison with previous reporting year
Higher

Please explain
Senmin is a manufacturer and supplier of mining chemicals used in the beneficiation of a wide range of ores such as platinum, copper, zinc, coal etc as well as polyacrylamides used for tailings treatment. The intensity is calculated by dividing the total volume of water withdrawn by Senmin by the total amount of product produced. Water intensity is monitored at the Senmin Sasolburg and Waltloo facilities to identify areas of poor efficiencies and put in place measures to achieve optimal efficiencies. Water intensity increased by 8.92% between the 2017 and 2018 financial years. This is the result of reduced production at the facility which removed the economies of scale benefit which we see at higher production levels. We anticipate that our water intensity will decrease going forward as we put in place initiatives to reduce our water withdrawals under our Going Green Programme.

Product type
Specialty inorganic chemicals

Product name
Ammonium Nitrate Solution

Water intensity value (m3)
11.72

Numerator: water aspect
Total water withdrawals

Denominator: unit of production
Ton

Comparison with previous reporting year
Higher

Please explain
Ammonium nitrate solution is manufactured by AEL (part of the Mining & Solutions Pillar) and supplied to the mining sector. Water intensity is calculated by dividing the total volume of water withdrawn for AEL by the tonnes of ammonium nitrate solution produced. Water intensity is monitored at a the AEL Modderfontein facility level to identify areas of poor efficiencies and put in place measures to achieve optimal efficiencies. There was an increase in water intensity of 4.27% between the 2017 and 2018 financial years. We anticipate that our water intensity will decrease going forward as we continue to look at ways of reducing our water withdrawals.

W1.4

(W1.4) Do you engage with your value chain on water-related issues?
Yes, our customers or other value chain partners

W1.4c

(W1.4c) What is your organization's rationale and strategy for prioritizing engagements with customers or other partners in its value chain?

AECI engages with a broad spectrum of stakeholders. Key stakeholders include employees, trade unions, internal and external auditors, shareholders and fund managers, financiers, customers, suppliers, technology and business partners, local and national government structures, industry bodies, neighbouring communities, special interest groups and the media. Our engagement with government and communities is further discussed below -

· Government - Legal compliance is of utmost importance to AECI and, as such, engaging with relevant authorities is a business imperative. Such engagement may range from advocacy initiatives, to cooperative work with those regulators. To facilitate engagement, AECI and/or its businesses may choose to develop relationships with relevant government and regulatory entities in a proactive manner. This engagement typically takes place in meetings or through the provision of written commentary on various policies and regulations. We also engage with government through CAIA, the industry association for the chemicals industry. The success of our engagement is measured through our understanding of the regulations, our preparedness to comply and our compliance with the regulations. It is also measured through the consideration that government gives to our feedback on various pieces of legislation.

· Communities - We engage with our communities on water-related issues. At Modderfontein, AEL oversees the functioning of a Community Awareness and Emergency Response Committee. At the Umbogintwini Industrial Association, issue-specific stakeholder and community liaison forums deal with water quality, air emissions etc. Engagement with communities is also typically done through organised projects and programmes.

All engagement by AECI employees is subject to the Group's Code of Ethics and Business Conduct as approved by the AECI Board. This Code 'is designed to provide clear guidelines for engaging with all stakeholders.'

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?
Yes

W2.1a

(W2.1a) Describe the water-related detrimental impacts experienced by your organization, your response, and total financial impact.

Country/Region
South Africa

River basin
Berg-Olifants

Type of impact driver
Physical

Primary impact driver
Drought

Primary impact
Reduced revenues from lower sales/output

Description of impact
In both the 2017 and 2018 reporting years, the drought in the Western Cape impacted on several of our businesses. In the reporting year - a) Nulandis continued to be adversely affected by the depressed trading conditions in South Africa's agricultural sector where output remained curtailed, mainly due to the impact of climate-related challenges. The magnitude of the impact is high, with profit from Nulandis down by 11% from R133 million to R119 million in the 2018 financial year. Nulandis manufactures and supplies an extensive range of crop production products, plant nutrients and services for the agricultural sector. b) ImproChem reports that persistent drought effects impacted on the performance of the local water treatment chemicals market. Diminished water flow rates result in lower turbidity and hence lower dosages of purification chemicals. Profit for this pillar declined by 34% from 182 million to 120 million in the 2018 financial year.

Primary response
Develop new products and/or markets

Total financial impact
76000000

Description of response
The financial impact is reported as the reduced profit from Nulandis and ImproChem. Our response is to continue to engage with customers to understand their water-related risks and to identify how best AECI can support them. We also invest in research and development which allows our businesses to diversify their product mix. Our businesses have developed several products and services that assist customers to reduce water usage and manage water-related risks. The intention is that the demand for these products and services will increase in drought conditions, offsetting the reduced demand for other existing products and services in the same conditions. Examples of products are as follows – a) Nulandis has developed a sustainable approach to agriculture called 'NuWay®.' NuWay® seeks to build soils that better retain nutrients and water to buffer against environmental stresses and recycle nutrients from soil organic matter. b) Biocult has developed a Mycorrhizae-based product that increases the robustness and yields of crops. It assists crops to weather droughts and changes in rainfall patterns. c) ImproChem provides water management solutions to customers. d) We have a collaboration agreement with the Israel-based aggrotech company, SupPlant, that developed a sensor-based system that waters crops according to gathered data, while optimising water consumption and alerting farmers of the state of the crops.

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?
No

W3. Procedures

W-CH3.1

(W-CH3.1) How does your organization identify and classify potential water pollutants associated with its activities in the chemical sector that could have a detrimental impact on water ecosystems or human health?

AECI is a diverse company providing products to a broad spectrum of customers in the mining, water treatment, plant and animal health, food and beverage, infrastructure and general industrial sectors. Most manufacturing sites are ISO14001 certified and subscribe to the Responsible Care Principles. Water pollution is managed differently across the business depending on the risks posed to water ecosystems or human health. We classify products according to the Globally Harmonised System and we classify waste according to the SANS 10234 standard. All products have a safety data sheet which categorises substances according to severe toxic and ecotoxic effects, high persistence in the natural environment and have the potential to bioaccumulate. It is from these safety data sheets that potential water pollutants are identified.

Water-related impacts on ecosystems and human health were considered where our operations discharge effluent into the sea and river:

For operations that discharge into the ocean, annual independent Ecological and Physico-chemical Marine Monitoring surveys are conducted to assess the status of the seabed communities and the extent of any detectable effects arising from the effluent discharges to the offshore receiving environment. The impact was not significant.

For operations that discharge into river courses, the operations are bound by a WUL with several conditions which need to be adhered to. The effluent arising from the process is largely nitrogen based. The increased nitrogen load is of concern due to the increased risk of eutrophication to the Jukskei River catchment. Eutrophication is characterized by excessive plant and algal growth due to the increased availability of one or more limiting growth factors needed for photosynthesis. This can have dramatic consequences for drinking water sources, fisheries and recreational water bodies. The compliance is monitored and enforced by the National Department of Water and Sanitation. In addition, the WUL requires the operation to conduct:

1. Biomonitoring assessments annually

2. Groundwater monitoring quarterly and biannually where there is a risk (risk determined based on historical activities)

3. Surface water monitoring where effluent is discharged to a fresh water resource.

Where effluent is discharged to a municipal sewer operating companies are bound by local municipal requirements imposing various limits on effluent discharged in terms of quantity and quality of effluent.

Water related impacts in our value chain, particularly those to which our customers are exposed are considered. AECI offers water treatment solutions in the public and private sector where customer's processes result in water pollutants released to stressed water resources. The impacts vary across private and private sector.

W-CH3.1a

(W-CH3.1a) Describe how your organization minimizes adverse impacts of potential water pollutants on water ecosystems or human health. Report up to ten potential pollutants associated with your activities in the chemical sector.

Potential water pollutant	Value chain stage	Description of water pollutant and potential impacts	Management procedures	Please explain
Nitrogen	Direct operations	AEL manufactures explosives for the mining sector. The effluent arising from the process is largely nitrogen based. The increased nitrogen load is of concern due to the increased risk of eutrophication to the Jukskei River catchment.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages Other, please specify (Implementation projects)	The operation monitors compliance with effluent quality standards on a daily, weekly and monthly basis. Immediate action is taken to rectify any non-compliances by for example containing spillages, identifying process safety risks and mitigating them, ensuring fail safe equipment is functioning. Measures to prevent spillage, leaching, and leakages are ongoing. High risk operations are ISO 14001 certified and have incident management systems in place to continuously prevent and manage environmental incidents. Success of management interventions is measured by monitoring the surface water and boreholes around the site on a daily, weekly, quarterly and annual basis and conducting independent assessments of the surface and groundwater. One such assessment is the Biomonitoring study conducted on the receiving environment to assess the biotic integrity of the Modderfontein Spruit and Jukskei River.
Anionic surfactants	Direct operations	Chemical Initiatives, a division of AECI, manufactures surfactants for the home care industry.	Compliance with effluent quality standards Measures to prevent spillage, leaching, and leakages Other, please specify (Environmnetal and waste water procedures)	High anionic surfactants could find their way into a fresh water stream when there is loss of containment from the process. The following initiatives have been implemented on site to minimise loss of containment: 1. The integrity of equipment is regularly inspected to ensure it is still suitable for use and associated equipment, e.g. pumps are fixed when found to be leaking. 2. All areas contain effluent sumps and trenches which contain and control effluent water to the treatment plant. 3. Effluent treatment plant is in place to treat effluent before discharge to the municipal sewer. 4. All storage areas are bunded and any leaks are contained.
Sulphuric acid	Distribution network	Chemical Initiatives, a business in the Chemicals Pillar manufactures sulphuric acid, one of its main products. The product may represent a danger to aquatic organisms at certain concentrations based on ecotoxicological testing performed on fish and fresh-water invertebrates. It is also dangerous to human health: can cause severe skin burns and eye damage. When released into the upper atmosphere, sulfuric acid exists as particles or droplets. The acid particles dissolve in clouds, fog, rain, or snow, resulting in very dilute acid solutions. This may impact the environment as wet acid deposition ('acid rain').	Other, please specify (Training, monitoring and risk assessment)	AECI is currently developing a strategy to track, manage and mitigate transportation incidents in the Group. Engagement with transporters is key and will focus on aspects such as training, audits, tracking systems, route risk assessments, driver fatigue. Currently AECI companies track all transportation incidents relating to transport of their products. If there is an accident and product spills, the environmental specialist or manager ensures that clean-up is effectively conducted with minimal impact on the receiving environment
Nitrogen	Distribution network	AEL manufactures explosives for the mining sector which is transported by contractors to mining sites. In the event of a transportation incident the spillage of explosive products, if it enters a river course, could result in an increased risk of eutrophication. This can have dramatic consequences for drinking water sources, fisheries and recreational water bodies.	Management procedure under development Other, please specify (Training, monitoring and risk assessment)	AECI is currently developing a strategy to track, manage and mitigate transportation incidents in the Group. Engagement with transporters is key and will focus on aspects such as training, audits, tracking systems, route risk assessments, driver fatigue. Currently AECI companies track all transportation incidents relating to transport of their products. If there is an accident and product spills, the environmental specialist or manager ensures that clean-up is effectively conducted with minimal impact on the receiving environment.

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Direct operations

Coverage
Full

Risk assessment procedure
Water risks are assessed as part of an enterprise risk management framework

Frequency of assessment
Six-monthly or more frequently

How far into the future are risks considered?
3 to 6 years

Type of tools and methods used
Tools on the market
Enterprise Risk Management
International methodologies

Tools and methods used
WRI Aqueduct
ISO 31000 Risk Management Standard
Other, please specify (Analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk)

Comment
We identify risks to our direct operations. This risk assessment process covers all businesses and all geographies in which our businesses operate. We assess risks on six-monthly basis. Risks are evaluated up to 10 years in the future. We use a combination of tools and methods. Our risk assessment process is underpinned by the Group Risk Management Policy and the Group Enterprise Risk Management Framework which are based on the principles of ISO 31000 and King IV. We also use WRI Aqueduct to identify water-stressed areas. The identification of risks at Group-level is also informed by the assessment and monitoring of the broader context in which the Group operates in terms of the political and economic landscape, industry, labour and financial market trends. Work includes the analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk. These serve as an early warning system or a mechanism for the identification of future risks and opportunities.

Supply chain

Coverage
Partial

Risk assessment procedure
Water risks are assessed as part of an enterprise risk management framework

Frequency of assessment
Six-monthly or more frequently

How far into the future are risks considered?
3 to 6 years

Type of tools and methods used
Tools on the market
Enterprise Risk Management
International methodologies

Tools and methods used
WRI Aqueduct
ISO 31000 Risk Management Standard
Other, please specify (Analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk)

Comment
All our businesses are asked to identify risks in their supply chain. We assess risks on six-monthly basis. Risks are evaluated up to 10 years in the future. We use a combination of tools and methods. Our risk assessment process is underpinned by the Group Risk Management Policy and the Group Enterprise Risk Management Framework which are based on the principles of ISO 31000 and King IV. We also use WRI Aqueduct to identify water-stressed areas. The identification of risks at Group-level is also informed by the assessment and monitoring of the broader context in which the Group operates in terms of the political and economic landscape, industry, labour and financial market trends. Work includes the analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk. These serve as an early warning system or a mechanism for the identification of future risks and opportunities.

Other stages of the value chain

Coverage
Full

Risk assessment procedure
Water risks are assessed as part of an enterprise risk management framework

Frequency of assessment
Six-monthly or more frequently

How far into the future are risks considered?
3 to 6 years

Type of tools and methods used
Tools on the market
Enterprise Risk Management
International methodologies

Tools and methods used
WRI Aqueduct
ISO 31000 Risk Management Standard
Other, please specify (Analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk)

Comment
All our businesses are asked to identify risks in their supply chain. We assess risks on six-monthly basis. Risks are evaluated up to 10 years in the future. We use a combination of tools and methods. Our risk assessment process is underpinned by the Group Risk Management Policy and the Group Enterprise Risk Management Framework which are based on the principles of ISO 31000 and King IV. We also use WRI Aqueduct to identify water-stressed areas. The identification of risks at Group-level is also informed by the assessment and monitoring of the broader context in which the Group operates in terms of the political and economic landscape, industry, labour and financial market trends. Work includes the analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk. These serve as an early warning system or a mechanism for the identification of future risks and opportunities.

W3.3b

(W3.3b) Which of the following contextual issues are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	Relevant, always included	Water availability at river basin-level is relevant and is always included in our risk assessments. We are reliant on sufficient amounts of good quality freshwater to operate. It is acknowledged that our ability to operate would be compromised if we were unable to source sufficient amounts of good quality freshwater. Our businesses are asked to identify water-related risks to their operations, suppliers and customers. As part of this, they consider both current and emerging risks presented from water availability. One example is the Acacia Operating Services (AOS) facility, which forms part of the Property Business. This facility in Umbogintwini, withdraws water from the river basin, treats it and provides water to the tenants in the Umbogintwini Complex. AOS has a Water Services Agreement with the Department of Water and Sanitation and regularly assesses water availability. Water availability and the associated risks are assessed in a number of ways. We use WRI Aqueduct and internal company knowledge. Our internal company knowledge includes information gathered from engagement with stakeholders like the Department of Water and Sanitation and the local catchment authorities etc.
Water quality at a basin/catchment level	Relevant, always included	Water quality at river basin-level is relevant and is always included. Changing water quality could have an impact on our goods and services, especially in our businesses where water is incorporated into our products. Our businesses are asked to identify water-related risks to their operations, suppliers and customers. As part of this, they consider both current and emerging risks presented from water quality for both withdrawals and discharges. One example is the AOS facility which has a Water Services Agreement with the Department of Water and Sanitation and regularly assesses water quality. Water quality and the associated risks are assessed in a number of ways. We use WRI Aqueduct and internal company knowledge. Our internal company knowledge includes information gathered from engagement with stakeholders like the Department of Water and Sanitation and local catchment authorities etc.
Stakeholder conflicts concerning water resources at a basin/catchment level	Relevant, always included	Stakeholder conflicts are factored into our water-related risk assessments as we understand that they could have an impact on supply of water. Major conflicts could result in interruptions to supply of water, impacting on our ability to operate. We also understand that our own water usage impacts on other stakeholders at a basin/catchment level. Our businesses are asked to identify water-related risks to their operations, suppliers and customers. As part of this, they consider both current and emerging risks presented by existing or potential stakeholder conflicts. To identify and assess these risks we engage with our stakeholders on an ongoing-basis. For example, local communities surrounding our AEL facility in Modderfontein attend the Community Awareness and Emergency Response Committee Meetings where material water issues are discussed, amongst other things. At the Umbogintwini Industrial Association, issue-specific stakeholder and community liaison forums deal with water quality, air emissions etc.
Implications of water on your key commodities/raw materials	Relevant, always included	Risks associated with water quantity and quality and its impact on our key commodities and raw materials is relevant and always included in our risk assessments. An example would be the SCP operation which was required to purchase strategic consignments of raw materials in the 2017 financial year owing to the drought in the Western Cape and severe flooding in Argentina. Although a correction was made in the 2018 financial year, our supply chain is still considered to be exposed to water-related risks. As such, our businesses are asked to identify risks to direct operations, suppliers and customers. As part of this, they consider both current and emerging risks in the value chain. These risks are assessed in a number of ways. We use WRI Aqueduct and internal company knowledge. Our internal company knowledge includes information gathered through our businesses engaging with their value chains.
Water-related regulatory frameworks	Relevant, always included	Water-related regulatory frameworks are relevant and always considered in our risk assessments. We understand that non-compliance may impact on our ability to operate. We consider risks associated with current and emerging regulation on our own operations, our suppliers and our customers. Our businesses are asked to identify water-related risks to their operations, suppliers and customers. This includes regulatory risks. In order to identify and assess these risks, we engage with relevant authorities. Such engagement may range from advocacy initiatives associated with the development of legislation and standards, to cooperative work with those regulators who have the responsibility of governing the Group's activities through the application of these laws and standards. For example, AEL Modderfontein has stringent requirements set by Department of Water and Sanitation on water quality (groundwater and surface water). This is factored into the water-related risk assessment done by AEL. We engage regularly with this Department to ensure that expectations are communicated and managed. We also engage with government through CAIA, the industry association for chemical producers.
Status of ecosystems and habitats	Relevant, always included	The impacts that our water withdrawals and discharges have on ecosystems and habitats is relevant and always included in our risk assessment. As a responsible corporate citizen, we are committed to protecting the ecosystems and habitats in which we operate. In order to ensure this, we need to consider risks to ecosystems and habitats. As such, our businesses are asked to identify water-related risks to their operations, suppliers and customers. As part of this, they consider both current and emerging risks that could impact on the status of ecosystems and habitats. We use internal company knowledge to identify these risks. We also identify these risks through engagement with various stakeholders such as our local communities. At Modderfontein, AEL oversees the functioning of a Community Awareness and Emergency Response Committee. At the Umbogintwini Industrial Association, issue-specific stakeholder and community liaison forums deal with water quality, air emissions etc. Risks associated with ecosystems and habitats, if any, are managed by the individual facilities in collaboration with government, other local water users and the local communities.
Access to fully-functioning, safely managed WASH services for all employees	Relevant, always included	Providing potable water, adequate sanitation and hygiene for all employees is of utmost importance to AECI. All facilities ensure the availability of fully-functioning WASH services for all employees. This is integrated into the day-to-day operations of the facilities and monitored by our operations. We acknowledge that if we were unable to supply potable water due to drought or infrastructure challenges, this would present a risk to our operations and negatively impact on our employees and their well-being. For this reason, access to fully-functioning and safe management of WASH services for all employees is considered in our risk assessments. As part of this, both current and emerging risks to provision of WASH services are considered. These risks are assessed in a number of ways. We use WRI Aqueduct and internal company knowledge. Our internal company knowledge includes information gathered through our businesses engaging with employees, other local water users, communities etc.
Other contextual issues, please specify	Not considered	No other issues are relevant.

W3.3c

(W3.3c) Which of the following stakeholders are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Customers	Relevant, always included	These risks have the ability to impact on demand for our goods and services. As such, we always include customers in our water-related risk assessments. Examples of impacts of water-related risks in the 2018 financial year include – a) Nulandis reported a reduced profit due to the drought in the South African agricultural sector which curtailed output. b) Improchem also reported a reduced profit in the 2018 financial year due to the poor performance of the local water treatment chemicals market owing to lower demand as a result of persistent drought effects. Diminished water flow rates result in lower turbidity and hence lower dosages of purification chemicals. We consider all current and emerging risks to our customers. Our businesses engage with customers on a regular basis to identify risks and opportunities and how best AECI can support in minimising risks and maximising opportunities. Engagement typically takes place through meetings. Our management of this risk is best demonstrated by our new products and services that assist customers to reduce their water withdrawals and manage their water-related risks. One example is our collaboration with SupPlant which is an Israel-based aggrotech company that developed a sensor-based system that autonomously waters crops according to gathered data, while optimising water consumption and alerting farmers of the state of the crops, soil, air, and irrigation in a field, vineyard or orchard. To date, we have deployed the technology at 15 sizeable farms in the Western Cape and the feedback from farmers has been encouraging.
Employees	Relevant, always included	Employees require fully-functioning WASH services. Group facilities ensure that these services are provided to their employees. The provision of potable water and adequate sanitation to our employees is factored into our risk assessment process. In addition, we understand that the behaviour of our employees can impact on our water usage. As such, employees are always factored into our water-related risk assessments. AECI and our businesses engage with employees on an on-going basis. This takes place via communication in print, electronic media and personal interactions between the Group's leadership at all levels and the staff complement as a whole. We also engage with employees on water-related issues through – a) Our Going Green Programme: The aim of our Going Green Programme is to minimise environmental impact and drive a beyond compliance mind-set within AECI's own operations and across the value chain enabling AECI to be seen as the Company of Choice. The Programme has five key focus areas – GHG emissions, energy, water, waste and green chemistry. Part of this Programme includes awareness creation amongst employees. b) Our Innovation Platform: This Platform allows employees to submit ideas as to how we can improve. We have found this to be highly successful. In terms of improving the Business of Today, 27 internally-generated ideas have been launched. Of these, 16 have been implemented (nine commercially-based and seven SHEQ-based). Collectively, R14 million in additional profits or savings was achieved and the target is to increase this to R50 million in 2019.
Investors	Relevant, always included	Investors are always factored into water-related risk assessments. We understand that we are reliant on the continued support of our investors in order to be sustainable. In addition, our investors are becoming increasingly interested in how we manage our water-related risks and opportunities. AECI communicates with these stakeholders by way of a number of processes, including announcements released on the JSE's Stock Exchange News Service (SENS), the dissemination of financial results and reports electronically and in print, results presentations, business-specific presentations and site visits and one-on-one or small group meetings. The Company's Chief Executive, Chief Financial Officer and the other Executives conduct timely presentations on the Group's performance and strategy to institutional investors, financiers, financial analysts and the media in South Africa. The Executive Directors also undertake international roadshows in Europe and the USA, aimed mostly at potential investors. Further, there are regular one-on-one meetings with this group of stakeholders. Presentations, corporate actions and financial results, as well as any other information deemed relevant, are published on the Company's website. Stakeholders are advised of such newly-published items via SENS. Additional information on the Company, such as inter alia its management and governance policies and structures, is also available at www.aeciworld.com. We also communicate information on water-related issues through our participation in the investor-driven Water Security CDP.
Local communities	Relevant, always included	Local communities are relevant and always included in our water-related risk assessment process. We understand that communities living within the footprint of influence of manufacturing and storage sites could be impacted by our operations. As such, we engage with local communities regarding the impact of our facilities on water availability and quality. This engagement is facilitated by formal structures that we have established. At Modderfontein, for example, AEL oversees the functioning of a Community Awareness and Emergency Response Committee. At the Umbogintwini Industrial Association, issue-specific stakeholder and community liaison forums deal with water quality, air emissions etc. Engagement with communities is also typically done through organised projects and programmes. In the 2018 financial year, for example, four campaigns were implemented to address key Socio-Economic Development (SED) challenges in South Africa. One of the campaigns focused on drought relief. We were also involved in the Wize Wayz Water Care (WWWC) Project which aimed to create sustainable livelihoods through food security, water resource management and monitoring, and environmental conservation. The project has 122 volunteers who keep a 30km stretch of the eZimbokodweni River Catchment Area clean of litter and debris. They have also helped rehabilitate a local wetland.
NGOs	Relevant, always included	Although no NGOs and special interest groups have expressed concerns regarding our management of water, they are relevant and always included in our risk assessments. If an NGO were to express a concern, then we would engage with them to fully understand and address the concern. We engage with NGOs either directly or through CAIA, the industry association for the chemical industry. We also work closely with NGOs on specific environmental-protection initiatives.
Other water users at a basin/catchment level	Relevant, always included	Other water users at a catchment level are relevant and always factored into our risk assessment. We understand that these water users have the ability to impact on water availability and quality, both of which are critical to most of our operations. As such, our businesses are asked to identify risks associated with other water users. Current and future risks are identified. We engage with other water users through direct meetings, meetings of industry associations and through our engagement with neighbouring communities.
Regulators	Relevant, always included	Legal compliance is of utmost importance to AECI and, as such, engaging with relevant authorities is a business imperative. Regulators are always considered in our water-related risk assessments. We need to engage with government to ensure we are compliant with existing regulation and to be prepared for any changes to existing regulation and the introduction of new regulation. We understand that non-compliance could compromise our ability to operate. Such engagement may range from advocacy initiatives associated with the development of legislation and standards, to cooperative work with those regulators who have the responsibility of governing the Group's activities through the application of these laws and standards. To facilitate engagement, AECI and/or its businesses may choose to develop relationships with relevant government and regulatory entities in a proactive manner. This engagement typically takes place in meetings or through the provision of written commentary on various policies and regulations. We also engage with government through CAIA, the industry association for the chemicals industry.
River basin management authorities	Relevant, always included	River basin management authorities are relevant and we do factor them into our water-related risk assessments. We understand that they have an impact on how water is managed within a specific area and our ability to source water from within specific catchments. We engage with them to understand risks and to look at ways of managing these risks. For example, The Department of Water and Sanitation is engaged regularly in terms of the material issue of compliance with the WUL. River basin management authorities are engaged as and when required. Engagement takes place through direct meetings, industry associations and written correspondence.
Statutory special interest groups at a local level	Relevant, always included	No statutory special interest groups have expressed concern regarding AECI's water usage and management practices. However, these stakeholders are relevant and are always included in our water-related risk assessments as we understand that water is a shared resource. In terms of engagement, in some cases, these stakeholders are aligned with communities in which we operate. Although their engagement requirements often overlap with those of communities, their needs are recognised separately. Wherever possible, these stakeholders are encouraged to participate in the Group's affairs via existing structures (liaison forums and the like). Where this is not possible separate arrangements are made to meet the needs of the stakeholders who, as a rule, are concerned mainly with matters broadly classified as being environmentally- and health-based. Arrangements include meetings, site/business visits and participation in/support of interest group initiatives. Examples of interest groups in South Africa include the Modderfontein Conservation Society, the Wildlife and Environment Society of South Africa and residents' associations.
Suppliers	Relevant, always included	Suppliers are relevant and our businesses do factor suppliers into our risk assessments. We acknowledge that if our suppliers were to be impacted by water-related risks, it may compromise their ability to deliver the goods and services we require to operate. For this reason, our businesses monitor relationships with suppliers continually and are modified as required. Terms of engagement with customers and suppliers are clearly defined and, where appropriate, Group-wide policies and procedures guide the businesses to ensure that customer- or supplier-related risks are properly understood and managed in line with AECI's risk appetite.
Water utilities at a local level	Relevant, always included	Water utilities are relevant and always included in our water-related risk assessments. We engage with water utilities for facilities that are supplied by utilities. We do this to ensure we identify and manage any risks associated with supply of water. We understand that some of our facilities are reliant on water utilities for the supply of water, without which we cannot operate. For this reason, our businesses are asked to identify risks associated with water utilities and their ability to supply sufficient amounts of good quality freshwater. We engage with water utilities through meetings, industry associations and written correspondence.
Other stakeholder, please specify	Not relevant, explanation provided	No other stakeholders.

W3.3d

(W3.3d) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

The Group follows the risk management methodology comprising both bottom-up and top-down processes. The risk management methodology adopts a holistic approach in identifying, analysing, evaluating, treating, monitoring and reviewing risks. Our risk assessment process includes all of our businesses and all the geographies in which the businesses operate. Our businesses are also asked to disclose on risks in the value chain, which includes risks to suppliers and customers. Risks and opportunities are identified and considered as far into the future as 10 years. The risk assessment process is underpinned by the Group Risk Management Policy and the Group Enterprise Risk Management Framework which are based on the principles of ISO 31000 and King IV. The risk terminologies align with this international standard and King IV. Site-level risks are identified and assessed using a bottom-up process. Management teams of the various businesses within the Group are asked to identify risks and quantify the likelihood, timeline and magnitude of each risk. The top-down process (company-level) involves management at Corporate Head Office. Management at Corporate Head Office review the risks identified at site-level and also identify Group-level risks. Risks and opportunities, including water-related risks and opportunities, are prioritised on a 5 x 5 rating scale that sets out potential impacts and estimated probabilities of occurrence. Management teams decide whether to mitigate, transfer, accept or control water-related risks and whether to and how best to capitalise on opportunities. Support is provided by Corporate Head Office in the form of workshops with the management teams of the businesses.

W4. Risks and opportunities

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes, both in direct operations and the rest of our value chain

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

Substantive financial impact is defined in the consequence scales. A rating ranging from minor to severe is included in the consequence table with an associated financial amount. The table below outlines the ratings and associated financial impact -

Severe: >R120 million (loss or gain)

Major: >R80 – R120 million (loss or gain)

Serious: >R40 – R80 million (loss or gain)

Moderate: >R5 – R40 million (loss or gain)

Minor: R0 – R5 million (loss or gain)

A substantive financial impact is considered as a rating of higher than moderate; i.e. serious, major or severe rating. This is relevant to both our direct operations and our value chain (i.e. suppliers and customers). Examples for the 2018 financial year include –

a) Nulandis continued to be adversely affected by the depressed trading conditions in South Africa's agricultural sector where output remained curtailed, mainly due to the impact of climate-related challenges. This included droughts and changes in rainfall patterns. Nulandis reported an 11% decrease in profit, from R133 million to R119 million in the 2018 financial year.

b) ImproChem reported a 34% decrease in profit, from R182 million to R120 million in the 2018 financial year. The performance in the local water treatment chemicals market was negatively affected by lower demand owing to persistent drought effects. Diminished water flow rates result in lower turbidity and hence lower dosages of purification chemicals.

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	3	1-25	We have identified that three of our facilities are exposed to water risks. These facilities are our Nulandis operation and AEL Modderfontein in Gauteng and our SCP operation in the Western Cape – a) Nulandis was affected by reduced demand for its products as a result of the impact of the drought on the agricultural sector. b) SCP was also impacted by the drought through its supply chain. It was required to purchase strategic consignments of raw materials owing the drought in the Western Cape and severe flooding in Argentina. This had a negative impact on trade working capital in the 2017 financial year. Although a correction was evident in 2018, droughts and changes in rainfall patterns remain a risk to our supply chain. c) For AEL Modderfontein, we have identified risks associated with regulatory compliance. These facilities have been affected by water-related risks since 2017 and into the reporting year. As such, focus continues to be maintained on water management and efficiency as well as the development of new products and services for our customers.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive impact on your business, and what is the potential business impact associated with those facilities?

Country/Region
South Africa

River basin
Limpopo

Number of facilities exposed to water risk
2

% company-wide facilities this represents
1-25

Production value for the metals & mining activities associated with these facilities
<Not Applicable>

% company's annual electricity generation that could be affected by these facilities
<Not Applicable>

% company's global oil & gas production volume that could be affected by these facilities
<Not Applicable>

% company's total global revenue that could be affected
1-25

Comment
We have identified that our Nulandis operation and AEL Modderfontein are exposed to water-related risks.

Country/Region
South Africa

River basin
Berg-Olifants

Number of facilities exposed to water risk
1

% company-wide facilities this represents
1-25

Production value for the metals & mining activities associated with these facilities
<Not Applicable>

% company's annual electricity generation that could be affected by these facilities
<Not Applicable>

% company's global oil & gas production volume that could be affected by these facilities
<Not Applicable>

% company's total global revenue that could be affected
1-25

Comment
We have identified that our SCP operation is exposed to water-related risk.

W4.2

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Region

South Africa

River basin
Berg-Olifants

Type of risk
Physical

Primary risk driver
Drought

Primary potential impact
Reduced revenues from lower sales/output

Company-specific description
Water-related issues such as changes in precipitation patterns, droughts and floods may negatively impact on demand for our products and services. Examples in the reporting year are as follows - a) Nulandis reports that profit from the operations was 11% lower, from R133 million to R119 million in the 2018 financial year. Profit declined due to depressed trading conditions in South Africa's agricultural sector where output remained curtailed, mainly due to the impact of climate-related challenges which include droughts and changes in rainfall patterns. b) ImproChem also reports a reduction in revenue and profit from the operations owing to the poor performance of the local water treatment chemicals market due to persistent drought effects. ImproChem's revenue declined by 5%, from R1 454 million to R1 376 million. Our operations that rely on a continuous supply of good quality water may also be at risk. Changes in precipitation patterns may disrupt production, reduce revenue and/or increase operating costs.

Timeframe
Current up to 1 year

Magnitude of potential impact
Medium-high

Likelihood
Virtually certain

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
76000000

Potential financial impact figure - minimum (currency)
<Not Applicable>

Potential financial impact figure - maximum (currency)
<Not Applicable>

Explanation of financial impact
The potential financial impact is the reduced profit from Nulandis and ImproChem in the reporting year. This risk is considered substantive the potential financial impact is close to R80 million which is the upper limit for risks with a 'serious' rating.

Primary response to risk
Develop new products and/or markets

Description of response
This risk is managed through engagement with customers to understand their water-related risks and to identify how best AECI can support them. This risk is also managed through investment in research and development which allows our businesses to diversify their product mix. Examples in the reporting year include – a) Our collaboration agreement with Israel-based aggrotech company, SupPlant, to market its sensor-based system that autonomously waters crops according to gathered data, while optimising water consumption and alerting farmers of the state of the crops, soil, air, and irrigation in a field, vineyard or orchard. To date, we have deployed the technology at 15 sizeable farms in the Western Cape and the feedback from farmers has been encouraging. b) Our Water & Process Pillar installed and secured service contracts for four desalination plants in the reporting year. This was for customers affected by droughts and changes in rainfall patterns in the Western Cape. In terms of the risk associated with water use in our own operations, we implement initiatives to reduce water withdrawals, increase recycling and rainwater harvesting. For example, ImproChem has embarked on an effluent reduction and water re-use programme in the Group.

Cost of response
70000000

Explanation of cost of response
AECI's spend on the research and development of new products was in the region of R70 million for 2018.

Country/Region
South Africa

River basin
Limpopo

Type of risk
Regulatory

Primary risk driver
Regulation of discharge quality/volumes

Primary potential impact
Fines, penalties or enforcement orders

Company-specific description
AEL discharges effluent into a natural water resource. The most critical aspect related to this water use is the WUL that has been issued by the Department of Water and Sanitation. The WUL specifies very stringent compliance conditions which will require capital intensive projects to be implemented.

Timeframe
Current up to 1 year

Magnitude of potential impact
Medium

Likelihood
Likely

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
8000000

Potential financial impact figure - minimum (currency)
<Not Applicable>

Potential financial impact figure - maximum (currency)
<Not Applicable>

Explanation of financial impact
The financial impact is a fine for non-compliance.

Primary response to risk
Water-related capital expenditure

Description of response
This risk is managed through engagement with the Department of Water and Sanitation on the effluent discharge quality, groundwater quality parameters and target levels and through the implementation of projects to ensure compliance with the WUL. Examples of WUL-related projects approved to date are a cooling tower purge water treatment plant, diversion of effluent to the strong effluent system, a neutralisation plant etc.

Cost of response
13500000

Explanation of cost of response
The cost of the response is the water-related capex for the 2018 financial year for AEL Modderfontein.

W4.2a

(W4.2a) Provide details of risks identified within your value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Region
South Africa

River basin
Berg-Olifants

Stage of value chain
Supply chain

Type of risk
Physical

Primary risk driver
Drought

Primary potential impact
Reduction in capital availability

Company-specific description
Water-related risks such as droughts have the potential to impact on our supply chain. We have already experienced this in the juice business. In 2017, SCP was required to purchase strategic consignments of raw materials owing to extreme weather events such as the drought in the Western Cape and severe flooding in Argentina. This had a negative impact on trade working capital. Although a correction is evident in 2018, our supply chain is still exposed to water-related risks.

Timeframe
Current - up to 1 year

Magnitude of potential financial impact
Medium-high

Likelihood
Virtually certain

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
40000000

Potential financial impact figure - minimum (currency)
<Not Applicable>

Potential financial impact figure - maximum (currency)
<Not Applicable>

Explanation of financial impact
The financial impact is reported as the impact of the purchase of the strategic consignments on trade working capital for SCP.

Primary response to risk
Other, please specify (Engage with suppliers)

Description of response
We handle risks in our supply chain by engaging with our suppliers to identify these risks and ensure that they are being effectively managed. This engagement also allows us to identify and plan for disruptions. Our response in the case of SCP was to purchase strategic consignments of raw materials.

Cost of response
0

Explanation of cost of response
There is no cost to this response as our businesses engage with their value chains as part of the normal course of business.

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?
Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity
Products and services

Primary water-related opportunity
New R&D opportunities

Company-specific description & strategy to realize opportunity
The rising cost of water coupled with concerns about adequate long-term availability in many geographies is prompting companies to view water conservation as an imperative in terms of business sustainability. This opens up opportunities for AECI to develop new products and services. Examples include – a) Savannah grazing supplements launched by Chemfit, a division of AECI, to farmers in the Karoo. The supplement can be used by farmers to counteract the effects of dry, woody stalks in grass which result from the drought. b) Water use efficiency and preservation of top soil are being pursued by Nulandis through their NuWay® programme. As part of Nulandis' NuWay strategy, the company is evaluating a technology developed by Israeli Company, SupPlant, to optimize the management of the water requirements of

irrigated crops using Growth-Based Irrigation and Big-Data Irrigation Technology. The combination of in-field crop growth monitoring, real time weather data and autonomous irrigation scheduling can promote improved crop production and water savings. c) Biocult and Nulandis have developed products to assist clients manage the impacts of water-related risks Examples include Biocult's Mycorrhizae to enhance root mass and supply nutrients and Nulandis' Dekompakt to prevent soil crusting and hence water run-off and Genie Boost which assists with the conversion of crop residues into valuable soil humus.

Estimated timeframe for realization
Current - up to 1 year

Magnitude of potential financial impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
100000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact
The focus on Green Chemistry will most likely result in increased sales. We have estimated that new products and services are likely to contribute between 2% and 5% of the Group's profits in the next five years which is equivalent to between R40 million and R100 million based on 2018 operating profit numbers.

Type of opportunity
Markets

Primary water-related opportunity
Expansion into new markets

Company-specific description & strategy to realize opportunity
The rising cost of water coupled with concerns about adequate long-term availability in many geographies is prompting companies to view water conservation as an imperative in terms of business sustainability. This opens up new markets into which AECI can sell new and existing products and services. In the 2018 financial year, for example, ImproChem installed and secured service contracts for four desalination plants in the Western Cape where a drought was experienced in the 2017 and 2018 financial years. This opportunity is managed by assessing and monitoring the broader context in which the Group operates in terms of the political and economic landscape, industry, labour and financial market trends. Work includes the analysis of research materials and industry benchmarking studies by institutions such as the World Economic Forum, the World Bank and Control Risk. These serve as an early warning system or a mechanism for identifying future risks and opportunities, including markets opening up as a result of water-related risks. AECI also ensures that invests in the necessary skills and products needed to access these new markets.

Estimated timeframe for realization
Current - up to 1 year

Magnitude of potential financial impact
Medium-high

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
100000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact
The focus on Green Chemistry will most likely result in increased sales. We have estimated that new products and services as well as entry into new markets could contribute between 2% and 5% of the Group's profits in the next five years which is equivalent to between R40 million and R100 million based on 2018 operating profit numbers.

Type of opportunity
Efficiency

Primary water-related opportunity
Improved water efficiency in operations

Company-specific description & strategy to realize opportunity
There are opportunities within AECI to reduce water withdrawals and discharges. The implementation of these opportunities could improve water efficiency and reduce operating cost. In the 2018 financial year, several effluent and water optimisation projects were implemented under the Going Green Programme. This included – a) Recycling of water from the washbay at a Crest Chemicals facility; and b) Using of recycled water instead of potable water in processes at AEL Modderfontein. In the 2018 financial year, we revised our Going Green Programme and introduced a target to reduce our water usage by 10% from a 2018 baseline by 2025. Also in 2018, ImproChem completed water audits at some of the AECI facilities. Several opportunities to reduce water withdrawals and discharges at the Group's facilities in South Africa have been identified and are currently before management for approval.

Estimated timeframe for realization
Current - up to 1 year

Magnitude of potential financial impact
Medium

Are you able to provide a potential financial impact figure?
Yes, a single figure estimate

Potential financial impact figure (currency)
5000000

Potential financial impact figure – minimum (currency)
<Not Applicable>

Potential financial impact figure – maximum (currency)
<Not Applicable>

Explanation of financial impact
The roll out of the new Going Green Programme across businesses within the Group is likely to realise significant cost savings. We have estimated the cost saving as R5 million.

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, total water accounting data and comparisons with the previous reporting year.

Facility reference number
Facility 1

Facility name (optional)
AEL Modderfontein

Country/Region
South Africa

River basin
Limpopo

Latitude
-26.111455

Longitude
28.143172

Primary power generation source for your electricity generation at this facility
<Not Applicable>

Oil & gas sector business division
<Not Applicable>

Total water withdrawals at this facility (megaliters/year)
1674

Comparison of withdrawals with previous reporting year
Much higher

Total water discharges at this facility (megaliters/year)
1479.12

Comparison of discharges with previous reporting year
Higher

Total water consumption at this facility (megaliters/year)
194.88

Comparison of consumption with previous reporting year
Much higher

Please explain
This refers to AEL Modderfontein. Withdrawals and discharges are measured and monitored. Consumption is determined using a water balance from measured withdrawals and discharges. Our water withdrawals increased by 23.76%, from 1 352.50 ML in the 2017 financial year to 1 674.00 ML in the 2018 financial year. The increase can be attributed to improved reporting. Our discharges increased by 10.86%, from 1 334.26 ML in the 2017 financial year to 1 479.12 ML in the 2018 financial year. This increase is also due to improved reporting. Consumption increased due to an increase in water withdrawals and less of an increase in discharges. Going forward, we anticipate a reduction in our withdrawals, discharges and consumption as we implement projects aimed at improving our water efficiency and increasing water recycled. In the 2018 reporting year, we implemented a project to use recycled water as opposed to potable water in our processes. We also implemented projects to reduce our effluent.

Facility reference number
Facility 2

Facility name (optional)
Nulandis Lilianton (Boksburg)

Country/Region
South Africa

River basin
Limpopo

Latitude

-26.076621

Longitude
28.186538

Primary power generation source for your electricity generation at this facility
<Not Applicable>

Oil & gas sector business division
<Not Applicable>

Total water withdrawals at this facility (megaliters/year)
14.98

Comparison of withdrawals with previous reporting year
Much higher

Total water discharges at this facility (megaliters/year)
4.61

Comparison of discharges with previous reporting year
Much higher

Total water consumption at this facility (megaliters/year)
10.37

Comparison of consumption with previous reporting year
Higher

Please explain
Nulandis Lilianton measures withdrawals and discharges. Consumption is calculated as the difference between measured withdrawals and discharges. Water withdrawals increased by 25.63%, from 11.92 ML in the 2017 financial year to 14.98 ML in the 2018 financial year. This increase was due to improved reporting. Discharges increased from 2.39 ML in the 2017 financial year to 4.61 ML in the 2018 financial year. This increase is the same as the reported increase in withdrawal volume. Consumption increased as a result of the fact that withdrawals increased by slightly more than discharges. Going forward, we anticipate a reduction in our withdrawals, discharges and consumption as we look to achieve the target under the Going Green Programme to reduce our water usage by 10% from a 2018 baseline by 2025.

Facility reference number
Facility 3

Facility name (optional)
Southern Canned Products (SCP)

Country/Region
South Africa

River basin
Berg-Olifants

Latitude
-33.912762

Longitude
18.64396

Primary power generation source for your electricity generation at this facility
<Not Applicable>

Oil & gas sector business division
<Not Applicable>

Total water withdrawals at this facility (megaliters/year)
24.6

Comparison of withdrawals with previous reporting year
Lower

Total water discharges at this facility (megaliters/year)
21.17

Comparison of discharges with previous reporting year
Much lower

Total water consumption at this facility (megaliters/year)
3.74

Comparison of consumption with previous reporting year
Much higher

Please explain
This refers to SCP. Withdrawals are measured and monitored. Consumption is determined using a water balance from withdrawals and discharges. Water withdrawals reduced by 13.28%, from 28.71 ML in the 2017 financial year to 24.90 ML in the 2018 financial year. This decrease was due to conservation of water by this facility. Discharges reduced by 21.16%, from 26.85 ML in the 2017 financial year to 21.17 ML in the 2018 financial year. The decrease is due to reduced withdrawals as a result of a focus on conservation. Consumption increased as a result of the fact that the effluent volumes decreased by more than the withdrawal volumes. Water is forms part of our product at this facility and, therefore, water consumption is also production dependent. Going forward, we anticipate a reduction in our withdrawals, discharges and consumption as we implement projects aimed at water conservation.

W5.1a

(W5.1a) For each facility referenced in W5.1, provide withdrawal data by water source.

Facility reference number
Facility 1

Facility name
AEL Modderfontein

Fresh surface water, including rainwater, water from wetlands, rivers and lakes
167.35

Brackish surface water/seawater
0

Groundwater - renewable
0

Groundwater - non-renewable
0

Produced/Entrained water
0

Third party sources
1506.65

Comment
AEL Modderfontein sources water from a dam and from third parties (i.e. the municipality). Water withdrawals increased by 23.76%, from 1 352.50 ML in the 2017 financial year to 1 674.00 ML in the 2018 financial year. The increase can be attributed to improved reporting. Going forward, we expect that our withdrawals will reduce as we focus on recycling water within our process and improving our water efficiency.

Facility reference number
Facility 2

Facility name
Nulandis Lilianton

Fresh surface water, including rainwater, water from wetlands, rivers and lakes
0

Brackish surface water/seawater
0

Groundwater - renewable
0

Groundwater - non-renewable
0

Produced/Entrained water
0

Third party sources
14.98

Comment
At Nulandis Lilianton, withdrawals are measured. All withdrawals are sourced from the municipality. Water withdrawals increased by 25.63%, from 11.92 ML in the 2017 financial year to 14.98 ML in the 2018 financial year. This increase was due to improved reporting. Going forward, we expect that our withdrawals will reduce as we focus on recycling water within our process and improving our water efficiency.

Facility reference number
Facility 3

Facility name
Southern Canned Products (SCP)

Fresh surface water, including rainwater, water from wetlands, rivers and lakes
0

Brackish surface water/seawater
0

Groundwater - renewable
0

Groundwater - non-renewable
0

Produced/Entrained water
0

Third party sources
24.9

Comment
SCP sources water from the municipality. Water withdrawals are measured. Water withdrawals reduced by 13.28%, from 28.71 ML in the 2017 financial year to 24.90 ML in the 2018 financial year. This decrease was due to conservation of water by this facility. We expect that water withdrawals will continue to decrease going forward as we focus on improving our water efficiency. Note that we will always withdraw and consume water as it is leaves our facility as part of our product.

W5.1b

(W5.1b) For each facility referenced in W5.1, provide discharge data by destination.

Facility reference number
Facility 1

Facility name
AEL Modderfontein

Fresh surface water
938.5

Brackish surface water/Seawater
0

Groundwater
0

Third party destinations
540.62

Comment
AEL Modderfontein discharges into fresh surface water and into municipal treatment works. Our discharges increased by 10.86%, from 1 334.26 ML in the 2017 financial year to 1 479.12 ML in the 2018 financial year. This increase is also due to improved reporting. Going forward, we anticipate a reduction in our discharges as we continue to implement projects focused on reducing effluent volumes. In the 2018 financial year, we spent in excess of R13 million on water-related projects at this site.

Facility reference number
Facility 2

Facility name
Nulandis Lilianton

Fresh surface water
0

Brackish surface water/Seawater
0

Groundwater
0

Third party destinations
4.61

Comment
At Nulandis Lilianton, all effluent is discharged to municipal treatment works. Discharges are measured. Discharges increased from 2.39 ML in the 2017 financial year to 4.61 ML in the 2018 financial year. This increase is the same as the reported increase in withdrawal volume. Going forward, we expect our discharges to reduce in line with our withdrawals.

Facility reference number
Facility 3

Facility name
Southern Canned Products (SCP)

Fresh surface water
0

Brackish surface water/Seawater
0

Groundwater
0

Third party destinations
21.17

Comment
SCP discharges water to municipal treatment works. Discharges reduced by 21.16%, from 26.85 ML in the 2017 financial year to 21.17 ML in the 2018 financial year. The decrease is due to reduced withdrawals as a result of a focus on conservation. We anticipate that discharges will decrease in line with withdrawals going forward.

W5.1c

(W5.1c) For each facility referenced in W5.1, provide the proportion of your total water use that is recycled or reused, and give the comparison with the previous reporting year.

Facility reference number
Facility 1

Facility name
AEL Modderfontein

% recycled or reused
1-10%

Comparison with previous reporting year
This is our first year of measurement

Please explain
The water recycled at AEL Modderfontein is measured. This year, AEL Modderfontein implemented a project to use recycled water instead of potable water in processes.

Facility reference number
Facility 2

Facility name
Nulandis Lilianton

% recycled or reused
Not monitored

Comparison with previous reporting year
<Not Applicable>

Please explain
Processes and controls still to be put in place to measure amount of water recycled at this facility.

Facility reference number
Facility 3

Facility name
SCP

% recycled or reused
Not monitored

Comparison with previous reporting year
<Not Applicable>

Please explain
Processes and controls still to be put in place to measure amount of water recycled at this facility.

W5.1d

(W5.1d) For the facilities referenced in W5.1, what proportion of water accounting data has been externally verified?

Water withdrawals – total volumes

% verified
76-100

What standard and methodology was used?
ISAE3000

Water withdrawals – volume by source

% verified
76-100

What standard and methodology was used?
ISAE3000

Water withdrawals – quality

% verified
Not verified

What standard and methodology was used?
Although regularly measured and monitored for water from sources other than the municipality, this data is not verified.

Water discharges – total volumes

% verified
Not verified

What standard and methodology was used?
Although this is regularly measured and monitored, this data is not verified.

Water discharges – volume by destination

% verified
Not verified

What standard and methodology was used?
Although this is regularly measured and monitored, this data is not verified.

Water discharges – volume by treatment method

% verified
Not verified

What standard and methodology was used?
Although this is regularly measured and monitored, this data is not verified.

Water discharge quality – quality by standard effluent parameters

% verified
Not verified

What standard and methodology was used?
Although this is regularly measured and monitored, this data is not verified.

Water discharge quality – temperature

% verified
Not verified

What standard and methodology was used?
This is not relevant.

Water consumption – total volume

% verified
Not verified

What standard and methodology was used?
Consumption is determined using a water balance. Although the water balance includes verified data, consumption itself is not verified.

Water recycled/reused

% verified
Not verified

What standard and methodology was used?
This is not verified.

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?

Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

	Scope	Content	Please explain
Row 1	Company-wide	Reference to international standards and widely-recognized water initiatives Company water targets and goals Commitment to align with public policy initiatives, such as the SDGs Commitments beyond regulatory compliance Commitment to water-related innovation Commitment to stakeholder awareness and education Commitment to water stewardship and/or collective action Other, please specify (A commitment to our Going Green Programme)	Water forms part of our overarching Group SHEQ Policy. As AECI, we do not have multiple policies in place. Instead, we prefer to have one holistic Policy that guides our thinking around all SHEQ issues and shows the commitment of our top management. The Policy is underpinned with more focused framework which governs the implementation of this Policy and speaks directly to water-related issues. The Group SHEQ Policy is publicly available. It covers all our operations in all of the geographies in which we operate. We cover the following – a) Acknowledgement of our impact on the environment. b) To ensure compliance in line with ISO 14001. c) To set, measure and report on targets. d) To introduce KPIs to drive the achievement of targets. e) To support and align with the Global Reporting Initiative. f) To drive innovative environmental solutions in current operations and the business of tomorrow. g) To create awareness on Going Green to internal and external stakeholders. h) To drive a culture of good environmental practice and a beyond compliance mind-set in the workplace. i) To improve market competitiveness through Green Chemistry and best available technology in AECI's products and services. j) To reduce AECI's environmental impact through measurement and target setting. k) To improve visibility on AECI's Going Green programme to external stakeholders.

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual	Please explain
Board Chair	The AECI Board has over-arching responsibility for water-related issues. Responsibility was assigned to the Board in recognition of the potential impact of water-related risks on the organisation. The Board acknowledges that risk management is an integral part of the Group strategy-setting process and is accountable for risk management. This includes risks related to water use and management. The Board has appointed the Social and Ethics Committee to consider, recommend and monitor AECI's activities with regard to safety, health and environment and report accordingly to the Board. This includes water-related issues.

W6.2b

(W6.2b) Provide further details on the board's oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - all meetings	Monitoring implementation and performance Overseeing acquisitions and divestiture Overseeing major capital expenditures Providing employee incentives Reviewing and guiding annual budgets Reviewing and guiding business plans Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing innovation/R&D priorities Other, please specify (compliance aspects)	The Social and Ethics Committee meets quarterly. It reports back to the Board on water-related issues at all meetings of the Board. This includes information on our water footprint, water-related risks and opportunities and the management thereof etc. This information enables the Board to monitor the implementation of water-related initiatives and performance with regards to water efficiency. It also allows them to assess whether water-related risks and opportunities are being effectively managed. It is used in strategy and action plan development. It is also used in budget setting. When considering new projects, products and services, water-related issues are considered. Examples in the reporting year include – a) We signed a collaboration agreement with Israel-based agrotech company SupPlant to market its technology in South Africa and 14 other countries in Africa. The technology is a sensor-based system that autonomously waters crops according to gathered data, while optimising water consumption and alerting farmers of the state of crops, soil, air, and irrigation in a field, vineyard or orchard. To date, the technology has been deployed at 15 sizeable farms in the Western Cape and the feedback from farmers has been encouraging. b) ImproChem identified an opportunity to assist customers in securing water from alternative water sources to alleviate pressure off the municipal water network. In the reporting year, it installed and secured service contracts for four desalination plants in the Western Cape.

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)
Chief Executive Officer (CEO)

Responsibility
Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues
Quarterly

Please explain
The Chief Executive Officer has an overall, primary management and leadership role in the organisation. Included in this is responsibility for water-related issues. The Chief Executive Officer is supported by the Group Safety, Health and Environment Manager. This Manager has day-to-day responsibility for water-related issues, with a reporting line to the Chief Executive Officer. This Manager reports back to the Chief Executive Officer and the Social and Ethics Committee on environmental performance and water-related issues. The Group Safety, Health and Environment Manager is supported by the Group Environmental Specialist who provides environmental support and advice to AECI. Along with the Chief Executive Officer, the Social and Ethics Committee is also directly responsible for oversight and guidance on water-related issues. It is a Board-Appointed Committee that sits directly under the Board in the organisational structure and reports back to the full Board.

W-FB6.4/W-CH6.4/W-EU6.4/W-OG6.4/W-MM6.4

(W-FB6.4/W-CH6.4/W-EU6.4/W-OG6.4/W-MM6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?
Yes

W-FB6.4a/W-CH6.4a/W-EU6.4a/W-OG6.4a/W-MM6.4a

(W-FB6.4a/W-CH6.4a/W-EU6.4a/W-OG6.4a/W-MM6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?

	Who is entitled to benefit from these incentives?	Indicator for incentivized performance	Please explain
Monetary reward	Other C-suite Officer (Executive: Technical and Compliance)	Effluent quality improvements	The Executive: Technical and Compliance has key performance indicators included in his performance management plan linked to achieving compliance with the WUL for the AEL Modderfontein facility.
Recognition (non-monetary)	Director on board	Reduction of water withdrawals Efficiency project or target – direct operations Effluent quality improvements	An environmental award is given to the Managing Director of the company that performs the best in terms of reducing water, energy, water and GHG emissions. This award acknowledges excelled levels of environmental compliance, the quality of data reporting, the severity and nature of environmental incidents and improvements made in environmental management and Going Green. In the 2018 financial year, ImproChem was the recipient of the award. The award is accepted by the Managing Director on behalf of the company. ImproChem was recognised for environmental compliance at its manufacturing sites, it had no major, serious or moderate environmental incidents, it has excellent housekeeping practices, shows good support for Going Green initiatives, excellent tracking and awareness of environmental performance and it executed complex remediation projects without incident or production interruptions.
Other non-monetary reward	Other, please specify (Environment/ Sustainability managers)	Reduction of water withdrawals Efficiency project or target – direct operations Effluent quality improvements	Awards were given to Safety, Health and Environmental (SHE) practitioners relating to best SHE performance at the 2018 Annual SHE Conference. Emissions performance is an important component of the environmental aspect of SHE.

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

Yes, direct engagement with policy makers

Yes, trade associations

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

AECI ensures that all of its direct and indirect activities that influence policy are consistent in terms of messaging through the following –

i) AECI engages with its businesses to obtain feedback, consolidates this feedback and relays the message to government and/or industry associations as required. All engagement with government and industry associations such as CAIA takes place at Group-level.

ii) AECI ensures consistent messages are conveyed to stakeholders through central coordination of stakeholder engagement. This is done in collaboration with the Group Communication and Investor Relations Manager.

iii) AECI has introduced programmes such as the Going Green Programme to drive consistent messaging. The Going Green Programme focuses on environmental targets and production efficiencies to reduce energy and water usage. All processes related to the Going Green Programme are directly linked to AECI's vision and values and are reviewed on a regular basis to ensure relevancy and consistency not only with the AECI strategy, but also with the constantly evolving regulatory and business regime. Performance on Going Green Programme is regularly reported to the Executive Committee as well as the Social and Ethics Committee meetings.

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

Yes (you may attach the report - this is optional)

AECI IAR.pdf

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	16-20	Long-term is defined as greater than 5 years into the future and as far as 20 years into the future. This is in line with the other business practice time horizons. Water-related issues are integrated into our long-term business objectives. This includes water availability, cost and water-related risks to which ourselves and our customers are exposed. AECI understands that its long-term business objectives can only be fully achieved if environmental risks such as water-related risks are identified and addressed. For this reason, management of water-related risks, water efficiency improvements and partnerships with stakeholders underpin the business objectives. Not only does management of water support the business objectives, but water, in terms of Green Chemistry, has had a significant influence on the business objectives. One of AECI's priorities is Green Chemistry which is focused on encouraging the design of goods and services that are environmentally-friendly. This includes goods and services that are water-efficient. Examples include – a) Biocult has developed a product that increases the robustness and yields of crops. It assists crops to weather droughts. It also reduces the amount of irrigation required for optimal crop health. b) Nulandis developed NuWay® which is a strategy to develop sustainable agricultural practices across its client base. It offers a holistic solution for plant health that reduces water usage.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	16-20	Long-term is defined as greater than 5 years into the future and as far as 20 years into the future. This is in line with the other business practice time horizons. Water-related issues are integrated into our long-term business objectives and the strategy for achieving these objectives. Water-related issues include water-related risks and opportunities including water availability due to droughts and changes in rainfall patterns. AECI's business strategy focuses on domestic growth as well as ongoing expansion outside South Africa in the Group's chosen strategic areas of Mining Solutions, Water & Process, Plant & Animal Health, Food & Beverage and Chemicals. It is acknowledged that this growth cannot be achieved if water-related risks and opportunities are not effectively managed. As such, our strategy includes a focus on minimising water-related risks for both us and our customers and capitalising on water-related opportunities. Examples of ways we reduced our own withdrawals in the 2018 financial year include – a) Our AEL Modderfontein facility focused on recycling water and reducing potable water use in its processes; and b) Crest Chemicals also recycled water from a washbay in the reporting year. Our strategy also includes a focus on developing water-related or water efficient products and services. An example is the installation and servicing of desalination plants by ImproChem.
Financial planning	Yes, water-related issues are integrated	16-20	Long-term is defined as greater than 5 years into the future and as far as 20 years into the future. This is in line with the other business practice time horizons. Water-related issues are integrated into our financial planning process. We understand that water-related issues present both risks and opportunities to us which have the potential to impact on our revenue and operating profit. As such, water-related risks and opportunities are integrated into our financial planning. In the 2018 financial year, for example, Nulandis reports that profit reduced as a result of the impact of the drought on the agricultural sector and the associated reduced demand for products. The magnitude is significant with profits for Nulandis having declined by 11% from R133 million in 2017 to R119 million in 2018. We also consider the rising cost associated with water withdrawals and discharges. Examples include the increased price of water as a result of the water restrictions in the Western Cape. The magnitude is significant. In the Western Cape, our operations experienced water prices increase by greater than 100% in the prior year. We allocate capital to water efficiency projects. In 2018, for example, capital was allocated to the Going Green Programme for the implementation of several effluent and water optimisation projects. The objectives of these projects were to reduce water consumption and/or discharges and also to improve the quality of effluent discharged.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)

34.26

Anticipated forward trend for CAPEX (+/- % change)

20

Water-related OPEX (+/- % change)

-36.37

Anticipated forward trend for OPEX (+/- % change)

10

Please explain

Water-related capex increased significantly in the financial year owing to the implementation of effluent projects at both AEL Modderfontein and Chemical Initiatives. We anticipate that water-related capex will continue to increase as we look to implement initiatives that reduce our water withdrawals, increase our water reuse and recycled and reduce our effluent volumes. We anticipate increases in the region of 20%. Water-related opex decreased in the financial year due to maintenance costs associated with water infrastructure decreasing year-on-year. In the prior financial year, we performed major maintenance at AEL Modderfontein. We anticipate that our water-related opex will increase going forward due to increasing water tariffs. We anticipate increases in the region of 10%.

W7.3

(W7.3) Does your organization use climate-related scenario analysis to inform its business strategy?

	Use of climate-related scenario analysis	Comment
Row 1	No, but we anticipate doing so within the next two years	Although climate-related scenario analysis is not used to inform our business strategy, water-related risks and opportunities are considered in the development of our strategy. We understand the importance of using water efficiently. As such, we have implemented initiatives that reduce our water withdrawals and/or increase water recycled. This is being done through our Going Green Programme. One example of an initiative implemented in the reporting year was the recycling of water from the wash bay at a Crest Chemicals facility. It is important to note that our strategy does consider various scenarios that may occur in the future to allow for agility should the environment in which we operate change. We are likely to include climate-related scenarios in this going forward, possibly in the next two years. We have already started to make progress in this regard, having held a workshop to discuss climate-related scenario analysis and identify possible scenarios relevant to our pillars.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

No, and we do not anticipate doing so within the next two years

Please explain

Although we do not have a single internal water price, we do consider the costs associated with water, water treatment and managing water-related risks and opportunities when compiling business plans, budgeting and considering new investments. In our business plans, budgeting and when we consider new investments, we consider the actual price associated with water. We do not believe a single internal water price would be accurate given that all our businesses are charged different rates for water and effluent, depending on location and other factors. For this reason, we try to use water prices as close as possible to actual prices to ensure the robustness of our business plants, budgets and investment decisions.

W8. Targets

W8.1

(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Company-wide targets and goals	Goals are monitored at the corporate level	We recently introduced a target under our Going Green Programme to reduce our water withdrawals by 10% from a 2018 baseline by 2025. We will report on progress against this target in the next reporting period. We also have goals in place to optimise our water usage and reduce our effluent. We are committed to minimising our impact on the environment. Our goals are set to allow us to do this. Goals are applicable to all businesses and all geographies. Progress towards meeting the goals is measured and monitored at Group-level. We try to keep the measurement of progress relatively simple by using information that is already collected at Group-level as indicators.

W8.1b

(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.

Goal
Other, please specify (Optimise our water usage)

Level
Company-wide

Motivation
Other, please specify (Cost reduction)

Description of goal
We have a goal to reduce our water withdrawals and improve our water efficiency. This goal is applicable to all our businesses and all geographies in which our businesses operate. The motivation behind this goal is cost reduction and reduced exposure to water-related risks. Note that the timelines are indicative as it is an ongoing goal that is measured each year by comparing water withdrawals from the year in question against water withdrawals from the previous year. The goal is being implemented primarily through our Going Green Programme. Projects implemented in 2018 include the following – 1. The implementation of recycling from the washbay at a Crest Chemicals facility; and 2. The use of recycled water instead of potable water for use in processes at AEL Modderfontein. In the 2018 financial year, ImproChem completed water audits at some of our facilities. Various water efficiency initiatives were identified which have been presented to management for consideration.

Baseline year
2017

Start year
2017

End year
2018

Progress
The indicator is water withdrawals. Success is measured by a decrease in water withdrawals. We monitor water withdrawals and water efficiency at Group-level to monitor progress towards achieving our goal. Water withdrawn by the Group's operations increased by 13.62%, but this was due to the acquisition of Schirm and Much Asphalt in the reporting year. We anticipate a more accurate comparison next year. We also note that the water intensity for some of our products did decrease between the 2017 and 2018 financial years as a result of efforts to reduce our withdrawals and increase water reused and recycled.

Goal
Other, please specify (Reduce our effluent)

Level
Company-wide

Motivation
Other, please specify (Cost reduction and compliance)

Description of goal
We have a goal in place to reduce our effluent. This goal is applicable to all our businesses and all geographies in which our businesses operate. The motivation behind this goal is cost reduction and compliance. Note that the timelines are indicative as it is an ongoing goal that is measured each year by comparing discharges from the year in question against discharges from the previous year. This goal is implemented primarily through our Going Green Programme. The objectives were to reduce volumes discharged and also to improve the quality of effluent discharged. An example in the reporting year was the project at AEL Modderfontein which resulted in reduced discharges through effective management of surges from the Nitrates Area.

Baseline year
2017

Start year
2017

End year
2018

Progress
The indicator is discharges. Success is measured by a decrease in discharges. We monitor discharges at Group-level to monitor progress towards achieving our goal. There was a reduction in our discharges, although some of this reduction was due to errors in reporting last year that have since been corrected.

W9. Linkages and trade-offs

W9.1

(W9.1) Has your organization identified any linkages or tradeoffs between water and other environmental issues in its direct operations and/or other parts of its value chain?
Yes

W9.1a

(W9.1a) Describe the linkages or tradeoffs and the related management policy or action.

Linkage or tradeoff
Linkage

Type of linkage/tradeoff
Increased energy efficiency

Description of linkage/tradeoff
AECI is aware of the link between water and energy usage. An initiative focused on treating water could also incorporate an energy efficiency component. This linkage is not new to the reporting year, although there are some new examples for the 2018 financial year. This linkage is apparent in our own operations and our value chain, particularly our customers' operations. This linkage impacts positively on the Group as initiatives implemented to reduce water usage can also have the added benefit of reducing energy consumption. For example, AECI's Water and Solutions Pillar planned, designed, constructed and commissioned a desalination plant for a customer. The site is self-sufficient in terms of its potable water requirements which reduces pressure on the municipal water network, allowing the water to be used where needed. In addition to meeting the customer's freshwater needs, an energy recovery device was installed to reduce electricity consumption per m3.

Policy or action
Our businesses maximise the opportunities presented by this linkage. In our own operations, this is primarily done through our Going Green Programme. Under this Programme, we are looking for projects that allow us to reduce our energy consumption and/or water usage and reduce our discharges. There is a focus on projects that treat, re-use or recycle water at the same time as reducing energy consumption and vice versa. In our value chain, our businesses are engaging with customers to understand their needs. This includes identifying whether products or services offered can assist customers to maximise the opportunities presented by this linkage.

W10. Verification

W10.1

(W10.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1d)?
Yes

W10.1a

(W10.1a) Which data points within your CDP disclosure have been verified, and which standards were used?

Disclosure module	Data verified	Verification standard	Please explain
W1. Current state	Total withdrawals	ISAE3000	We have external verification of our total water withdrawals. We choose to verify this parameter as it is important to the business. It provides an indication of our efficiency and is a measure of our dependence on water. Our independent audit was conducted by Deloitte. It was Deloitte that selected the verification standard. This verification is conducted on an annual basis. For more information, please see the statement by our independent auditors in page 58 our Integrated Annual Report for 2018.

W11. Sign off

W-FI

(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

W11.1

(W11.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1	Chief Executive	Chief Executive Officer (CEO)

W11.2

(W11.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].
Yes

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	Public or Non-Public Submission	I am submitting to
I am submitting my response	Public	Investors

Please confirm below

I have read and accept the applicable Terms