



Water 2015 Information Request  
Anadarko Petroleum Corporation

**Module: Introduction**

**Page: W0. Introduction**

**W0.1  
Introduction**

Please give a general description and introduction to your organization.

Anadarko's mission is to deliver a competitive and sustainable rate of return to shareholders by exploring for, acquiring and developing oil and natural gas resources vital to the world's health and welfare. As of year-end 2014, the company had 2.86 billion barrels-equivalent of proved reserves, making it one of the world's largest independent oil and natural gas exploration and production companies. For more information about Anadarko, please visit <http://www.anadarko.com>.

Anadarko recognizes that proper water management and conservation are essential in developing energy resources. The company works diligently to manage, protect and conserve water through the use of improved technologies and engaging in collaborative industry efforts, including water-recycling programs and closed-loop systems that conserve water, reduce waste and consolidate equipment. The use of automated and pipeline systems also reduce truck traffic and our surface footprint. Anadarko is also working toward developing a comprehensive water-management inventory for oil and natural gas production.

**W0.2  
Reporting year**

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

<b>Period for which data is reported</b>
Wed 01 Jan 2014 - Wed 31 Dec 2014

**W0.3  
Reporting boundary**

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

Companies, entities or groups over which operational control is exercised

**W0.4  
Exclusions**

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

Yes

**W0.4a  
Exclusions**

Please report the exclusions in the following table

Exclusion	Please explain why you have made the exclusion
International operations	Anadarko tracks water data in accordance with regulatory requirements. Water data for international operations is immaterial to the company's overall portfolio and is not included in this report.

**Further Information**

**Module: Current State**

**Page: W1. Context**

**W1.1  
Please rate the importance (current and future) of water quality and water quantity to the success of your organization**

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of			We rely on the direct use of freshwater for drilling and, in part, for completions operations. Fresh

good quality freshwater available for use	Important	Not very important	water is important for the drilling process, in order to protect local aquifers. There is less need for freshwater for indirect purposes. Recently, to further reduce our need for freshwater, we have begun to drill more wells using air instead of water.
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Not very important	Consistent with our efforts to draw from a variety of sources so as to limit competition with municipal, agricultural and other consumers, we rely on recycled, brackish and produced water for completions operations in many of our larger plays. Sufficient amounts of such water is important in order for us to limit the amount of freshwater necessary for operations.

**W1.2**

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

Water aspect	% of sites/facilities/operations	Please explain
Water withdrawals- total volumes	76-100	Most of the operation teams measure the water withdrawals to ensure our compliance with various operational, contractual and regulatory requirements.
Water withdrawals- volume by sources	51-75	Withdrawals are either directly measured or estimated by source, by fresh (surface or ground), brackish and saline.
Water discharges- total volumes	76-100	Discharge of water into disposal wells or surface water are tracked for regulatory and contractual purposes.
Water discharges- volume by destination	76-100	We are required to measure the volume of water discharged to different destinations by regulation.
Water discharges- volume by treatment method	51-75	Most operations directly measure or can estimate the volume of water treated by method.
Water discharge quality data- quality by standard effluent parameters	1-25	Water quality data by effluent parameters is captured, as required by regulations.
Water consumption- total volume	76-100	Water use for drilling and completions is measured and monitored.
Facilities providing fully-functioning WASH services for all workers	76-100	Anadarko provides fully functioning water, sanitation and hygiene services for all workers at company living quarters and office structures.

**W1.2a**

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

Source	Quantity (megaliters/year)	How does total water withdrawals for this source compare to the last reporting year?	Comment
Fresh surface water	14577.70	Lower	We reduced fresh water use and are increasing the use of recycled and brackish water. In 2014, we began reporting water use for offshore operations into CDP.
Brackish surface water/seawater	104.7	About the same	We use seawater for offshore operations, in a manner consistent with regulatory requirements.
Rainwater	0	About the same	We currently do not rely on rainwater as a source of water.
Groundwater - renewable	9671.05	Lower	The amount of reused produce water has increased, which results in a reduction in fresh water use.
Groundwater - non-renewable	0	Not applicable	
Produced/process water	1357.72	Much higher	The amount of produced water used in our operations went from 951 mg/yr in 2013 to 1,357.72 mg/yr in 2014.
Municipal supply	5898.46	About the same	We primarily use municipal water for use in office buildings, so this number does not change very much year to year.
Wastewater from another organization	0	About the same	
Total	31609.63	About the same	Our water use varies with the amount of drilling and completions that are conducted, which did not change much in 2014. In 2014, we began reporting water use for U.S. offshore operations, so the numbers increased.

**W1.2b**

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

Destination	Quantity (megaliters/year)	How does total water discharged to this destination compare to the last reporting year?	Comment
Fresh surface water	650484.91	About the same	
Brackish surface water/seawater	19.35	About the same	
Groundwater	4939.18	About the same	We include all downhole injection for water disposal, as groundwater discharge.
Municipal treatment plant	0	About the same	
Total	655433.44	About the same	

**W1.2c**

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

How does this consumption

Consumption (megaliters/year)	figure compare to the last reporting year?	Comment
0	About the same	For the United States, Anadarko's net water consumption was positive in 2014. We discharged more water to the surface than was consumed downhole, due in large part to discharging CBM water to surface in Wyoming. These numbers have not significantly changed, since consumption is primarily based on the amount of water that returns during flowback and production. We added US offshore operations to our CDP report for 2014.

**W1.4**

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

Yes

**W1.4a**

**Please describe the detrimental impacts experienced by your organization related to water in the reporting year**

Country	River basin	Impact indicator	Impact	Description of impact	Length of impact	Overall financial impact	Response strategy	Description of response strategy
United States of America	Mississippi River	Reg-Regulatory uncertainty	Delays in permitting	Federal, state and local agencies are evaluating current water regulations and may require more extensive permitting requirements and additional water quality monitoring and treatment. This may result in permit delays and higher operating costs.	Estimated to be 2-5 years.	The financial impact is uncertain at this time.	Alignment of public policy positions with water stewardship goals Engagement with public policy makers Infrastructure investment Increased investment in new technology	We are assessing and implementing water strategies to expand on optionality for water sourcing, use and disposal. We are increasing investments in new technology and infrastructure. Anadarko staff regularly engage with public policy makers on water issues, including chairing the Energy Water Initiative (EWI). The EWI is comprised of 17 oil and gas companies working to enhance water technology for the industry.
United States of America	Rio Grande	Reg-Regulatory uncertainty	Higher operating costs	Federal, state and local agencies are evaluating current water regulations and may require more extensive permitting requirements and additional water quality monitoring and treatment. This may result in permit delays and higher operating costs.	Estimated to be 2-5 years.	The financial impact is uncertain at this time.	Alignment of public policy positions with water stewardship goals Engagement with public policy makers Infrastructure investment Increased investment in new technology	We are assessing and implementing water strategies to expand on optionality for water sourcing, use and disposal. We are increasing investments in new technology and infrastructure. Anadarko staff regularly engage with public policy makers on water issues, including chairing the Energy Water Initiative (EWI). The EWI is comprised of 17 oil and gas companies working to enhance water technology for the industry.
United States of America	Colorado River (Pacific Ocean)	Reg-Regulatory uncertainty	Higher operating costs	Federal, state and local agencies are evaluating current water regulations and may require more extensive permitting requirements and additional water quality monitoring and treatment. This may result in permit delays and higher operating costs.	Estimated to be 2-5 years.	The financial impact is uncertain at this time.	Alignment of public policy positions with water stewardship goals Engagement with public policy makers Infrastructure investment Increased investment in new technology	We are assessing and implementing water strategies to expand on optionality for water sourcing, use and disposal. We are increasing investments in new technology and infrastructure. Anadarko staff regularly engage with public policy makers on water issues, including chairing the Energy Water Initiative (EWI). The EWI is comprised of 17 oil and gas companies working to enhance water technology for the industry.
United States of America	Susquehanna River	Reg-Regulatory uncertainty	Delays in permitting	Federal, state and local agencies are evaluating current water regulations and may require more extensive permitting requirements and additional water quality monitoring and treatment. This may result in permit delays and higher operating costs.	Estimated to be 2-5 years.	The financial impact is uncertain at this time.	Alignment of public policy positions with water stewardship goals Engagement with public policy makers Infrastructure investment Increased investment in new technology	We are assessing and implementing water strategies to expand on optionality for water sourcing, use and disposal. We are increasing investments in new technology and infrastructure. Anadarko staff regularly engage with public policy makers on water issues, including chairing the Energy Water Initiative (EWI). The EWI is comprised of 17 oil and gas companies working to enhance water technology for the industry.

**Further Information**

**Module: Risk Assessment**

**Page: W2. Procedures and Requirements**

**W2.1**  
Does your organization undertake a water-related risk assessment?

Water risks are assessed

**W2.2**  
Please select the options that best describe your procedures with regard to assessing water risks

Risk assessment procedure	Coverage	Scale	Please explain
Comprehensive company-wide risk assessment	Direct operations	All facilities	A macro-level analysis of water-related risk informs decisions about water-related activities in Anadarko's Enterprise Risk Management Process (ERMP). Direct operations and facilities have begun conducting risk analyses, that include water stress, water availability, regional and local regulations, and stakeholder concerns. This assessment includes risks associated with water suppliers. In certain operations, site surveys and/or sampling are used to collect baseline data, and water-related risk is analysed on a per-project basis. Anadarko monitors current and future issues related to water risk and management.

**W2.3**  
Please state how frequently you undertake water risk assessments, what geographical scale and how far into the future you consider risks for each assessment

Frequency	Geographic scale	How far into the future are risks considered?	Comment
Annually	Business unit	1 to 3 years	Anadarko's operations evaluate water risk for a fiscal year as part of the budgeting process. Anadarko undertakes a rigorous macro-level analysis of the water-management programs to inform decisions about water-related issues and enhance water-management, conservation and recycling programs. On an asset basis, operations evaluates the risk of water availability and management across direct operations and the supply chain, including water availability, transport, and disposal.

**W2.4**  
Have you evaluated how water risks could affect the success (viability, constraints) of your organization's growth strategy?

Yes, evaluated over the next 1 year

**W2.4a**  
Please explain how your organization evaluated the effects of water risks on the success (viability, constraints) of your organization's growth strategy?

Anadarko evaluates water-related issues at multiple levels. Anadarko regularly evaluates risks and opportunities associated with water management, which are regularly reported to the Enterprise Risk Management Committee (ERMC). Depending on the magnitude of the risks or opportunities being assessed and acted upon, results may also be reported directly to Operations VPs. The Water Strategy Committee and associated teams define and implement a holistic water-management approach that assesses availability and prudent use of water, conservation technology development and public outreach to address water management and challenges according to local conditions and considerations. This Committee is undertaking a rigorous macro-level analysis of the company's water-management program in order to inform decisions about water-related issues and to enhance water sourcing, disposal, conservation and recycling programs.

Water management is also evaluated by a regional watershed and project basis. We monitor current and future issues related to water risk and management. The water-management strategy includes tracking: total water volume used in operations; sources of water (surface, groundwater, municipal, non-potable water, etc.); volume of produced water recycled; volume of water discharged; and volume of water injected downhole. Water quality is evaluated as each asset drills wells to better understand local groundwater aquifers and design wellbores to protect groundwater.

As part of its commitment to continuous improvement, Anadarko identified the reduction of the use "fresh water" as an opportunity or risk to future growth that can be mitigated in certain areas. Anadarko's key growth assets began to provide water-management plans and goals in the annual planning process. As a result, Anadarko's growth strategy includes implementing comprehensive water recycling programs in the Rockies, Southern and Appalachia regions, and evaluating recycling opportunities globally. In addition, water contracts are entered into on a relatively long-term basis. To minimize regulatory risk, we comply with local, state, regional and federal requirements, including for water quality, wastewater treatment and the protection of watersheds.

**W2.5**  
Please state the methods used to assess water risks

Method	Please explain how these methods are used in your risk assessment
	Anadarko has developed an internal process to evaluate risk around the use and management of water. It includes a life-cycle assessment approach. We reviewed and included aspects of the GEMI LWT, WBSCD GWT, IPIECA GWT for Oil and Gas, and WRI Aqueduct in the water risk tool. The methods used are uniquely tailored to upstream oil and natural gas operations at a local level, in order to best inform operational decisions. This includes evaluating local, regional and national external conditions, mitigating actions, and mitigating plans (GEMI), community engagement and stakeholder opportunities (WBSCD) and water scarcity at a local level (IPIECA). The operational scope of the assessment is for the complete life cycle of water use (i.e., construction, drilling, completions, production, and disposal).

## W2.6

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

Issues	Choose option	Please explain
Current water availability and quality parameters at a local level	Relevant, included	Anadarko considers and evaluates water availability and protection of the water quality of local aquifers in decision making and risk evaluation.
Current water regulatory frameworks and tariffs at a local level	Relevant, included	Anadarko considers and closely monitors risks associated with current water regulations in each assessment, including for water quality, availability, and disposal.
Current stakeholder conflicts concerning water resources at a local level	Relevant, included	Local stakeholders' perceptions and concerns are included in the assessment.
Current implications of water on your key commodities/raw materials	Relevant, included	Water is an important commodity in producing oil and natural gas, thus we work to estimate the implications of lack of availability of water.
Current status of ecosystems and habitats at a local level	Relevant, included	Water use at a local level can impact ecosystems, thus it is considered as a potential stakeholder concern in the assessment process, where appropriate.
Current river basin management plans	Relevant, included	Where river basin management plans are in existence, we consider such plans as a potential regulatory risk.
Current access to fully-functioning WASH services for all employees	Not relevant, explanation provided	Since we provide fully functioning WASH services at all office buildings, this is not considered a significant risk or included in the risk assessment.
Estimates of future changes in water availability at a local level	Relevant, included	The risk assessment includes changes in water availability on a local watershed basis.
Estimates of future potential regulatory changes at a local level	Relevant, included	Risk associated with potential future water regulations are included in each assessment, including for quality, availability, and disposal.
Estimates of future potential stakeholder conflicts at a local level	Relevant, included	We work to identify future potential stakeholder concerns around local water use and management and include it the assessment.
Estimates of future implications of water on your key commodities/raw materials	Relevant, included	Since we anticipate water to continue to be a critical commodity in producing oil and gas into the future, we work to estimate the implications of lack of availability of water.
Estimates of future potential changes in the status of ecosystems and habitats at a local level	Relevant, included	Water use at a local level can have a future impact ecosystems, thus it is considered as a future potential stakeholder concern where appropriate.
Scenario analysis of availability of sufficient quantity and quality of water relevant for your operations at a local level	Relevant, not yet included	Anadarko is working to include scenario analysis in the risk assessment tool.
Scenario analysis of regulatory and/or tariff changes at a local level	Relevant, not yet included	Anadarko is working to include scenario analysis in the risk assessment tool.
Scenario analysis of stakeholder conflicts concerning water resources at a local level	Relevant, not yet included	Anadarko is working to include scenario analysis in the risk assessment tool.
Scenario analysis of implications of water on your key commodities/raw materials	Relevant, not yet included	Anadarko is working to include scenario analysis in the risk assessment tool.
Scenario analysis of potential changes in the status of ecosystems and habitats at a local level	Relevant, not yet included	Anadarko is working to include scenario analysis in the risk assessment tool.
Other		

## W2.7

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

Stakeholder	Choose option	Please explain
Customers	Relevant, not yet included	At this time, the primary customers are not factored into the risk assessment, but may be considered in the future.
Employees	Relevant, not yet included	At this time, employees are not factored into the risk assessment, but may be considered in the future.
Investors	Relevant, included	Investors' concerns are considered in the risk assessment, particularly for areas of water scarcity.
Local communities	Relevant, included	The local community is factored into the risk assessment for current and future potential risks.
NGOs	Relevant, included	NGOs that are relevant to the industry, are considered in the risk assessment, particularly for water availability and quality.
Other water users at a local level	Relevant, included	NGOs that are relevant to the industry, are considered in the risk assessment, particularly for water availability and quality.
Regulators	Relevant, included	Regulators are always considered as relevant stakeholders for water assessments, including the level of concern about the water use from the industry.
River basin management authorities	Relevant, included for some facilities/suppliers	These authorities are included in a risk assessment, in our operating areas where they exist.
Statutory special interest groups at a local level	Relevant, included for some facilities/suppliers	Certain areas have groundwater conservation districts and other statutorily created groups that are included in the risk assessment.
Suppliers	Relevant, included	Service companies must run their equipment with the water that we supply, so they are a stakeholder in terms of the water quality necessary to effectively run the equipment. For example, a service company may not be able to use brackish water in their equipment.
Water utilities/suppliers at a local level	Relevant, included	Anadarko considers the quantity of water that water suppliers and utilities can provide its operations in evaluating risk. Thus, water suppliers are considered stakeholders in any risk assessment regarding water availability.
Other		

## Further Information

**Module: Implications**

**Page: W3. Water Risks**

**W3.1**

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

Yes, direct operations only

**W3.2**

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

A substantive change is a significant modification or expansion in the scope or nature of Anadarko's direct operations (not suppliers) at a field level, as measured by the level of activity or production of an asset from sourcing, management or disposal of water. Anadarko has a deep portfolio of opportunities in the U.S. onshore, most of which would be considered unconventional resources plays. As such, these assets require access to water for drilling and completions operations. Without an adequate supply of water, Anadarko and/or its suppliers would need to develop alternatives, allocate capital to other assets in its portfolio, and/or consider reducing the level of activity in a given play. The threshold amount of change necessary will differ among operational plays based upon the economics involved with the required change. These considerations are a significant part of our investment, engagement and water-management strategies to ensure adequate supplies of and appropriate disposal of water at all of our U.S. onshore growth opportunities. Additionally, activity levels are evaluated continuously as part of our budget process for each field. During the budget process, potential changes in operations and costs, including water availability, management and disposal, are considered.

**W3.2a**  
Please provide the number of facilities\* per river basin exposed to water risks that could generate a substantive change in your business, operations, revenue or expenditure and the proportion of total operations this represents

Country	River basin	Number of facilities	Proportion of total operations exposed to risk within river basin (%)	Comment
United States of America	Mississippi River	2	11-20	A facility is defined as an asset or field. Wattenberg - Facility 1 ETX/NLA - Facility 2
United States of America	Rio Grande	2	11-20	A facility is defined as an asset or field. Maverick - Facility 3 Delaware - Facility 4
United States of America	Susquehanna River	1	1-5	A facility is defined as an asset or field. Marcellus - Facility 5
United States of America	Colorado River (Pacific Ocean)	1	1-5	A facility is defined as an asset or field. Greater Natural Buttes - Facility 6

**W3.2b**  
Please provide the proportion of financial value that could be affected at river basin level associated with the facilities listed in W3.2a

Country	River basin	Financial reporting metric	Proportion of chosen metric that could be affected within the river basin	Comment
United States of America	Mississippi River	% global production volume	11-20	This area encompasses our Wattenberg, Carthage, East Texas, Kansas, and North Louisiana operations for oil and natural gas production in Colorado, Kansas, Texas and Louisiana.
United States of America	Rio Grande	% global production volume	11-20	This area encompasses our Delaware and Maverick operations for oil and natural gas production in Texas.
United States of America	Susquehanna River	% global production volume	1-5	This area encompasses our Marcellus operations for oil and natural gas production in Pennsylvania.
United States of America	Colorado River (Pacific Ocean)	% global production volume	1-5	This area encompasses our Greater Natural Buttes operations for oil and natural gas production in Utah.

**W3.2c**  
Please list the inherent water risks that could generate a substantive change in your business, operations, revenue or expenditure, the potential impact to your direct operations and the strategies to mitigate them

Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
United States of	Rio Grande	Physical-Drought	Higher operating costs	Temporary water stress translating to decreased supply, and likely impacts to transportation infrastructure.	1-3 years	Probable	Low-medium	Alignment of public policy positions with water stewardship goals Infrastructure	Medium	Continued evaluation and investment in water management strategies, technologies and systems that allow the company to decrease the use of fresh water in completions and increase the use of

America				It could result in limitations to future growth if states have to restrict water use.				investment Increased investment in new technology		recycled, brackish and other sources of water. The cost of response is based on increased cost of water. The infrastructure investment may have a strong ROI
United States of America	Colorado River (Pacific Ocean)	Physical-Drought	Higher operating costs	Temporary water stress translating to decreased supply, and likely impacts to transportation infrastructure. It could result in limitations to future growth if states have to restrict water use.	1-3 years	Probable	Low-medium	Alignment of public policy positions with water stewardship goals Infrastructure investment Increased investment in new technology	Medium	Continued evaluation and investment in water management strategies, technologies and systems that allow the company to decrease the use of fresh water in completions and increase the use of recycled, brackish and other sources of water. The cost of response is based on increased cost of water. The infrastructure investment may have a strong ROI
United States of America	Susquehanna River	Physical-Flooding	Closure of operations	Damage to transportation infrastructure and facilities. Interruption of production. If facilities are designed and maintained properly, the impact will be minimized.	>6 years	Probable	Medium	Infrastructure investment Increased investment in new technology	Low-medium	Ensure systems are capable of being proactively and promptly shut down. If designed and maintained properly, the cost will be low to medium.
United States of America	Rio Grande	Physical-Increased water scarcity	Higher operating costs	Possible limitations on surface water use and groundwater withdrawal could lead to project delays.	>6 years	Probable	Medium	Alignment of public policy positions with water stewardship goals Infrastructure investment Increased investment in new technology	Low-medium	Continued evaluation and investment in water management strategies, technologies and systems that allow the company to decrease the use of fresh water in completions. The cost of response is based on increased cost of water. The infrastructure investment may have a strong ROI.
United States of America	Mississippi River	Physical-Increased water scarcity	Higher operating costs	Possible limitations on surface water use and groundwater withdrawal could lead to project delays.	>6 years	Probable	Medium	Alignment of public policy positions with water stewardship goals Infrastructure investment Increased investment in new technology	Low-medium	Continued evaluation and investment in water management strategies, technologies and systems that allow the company to decrease the use of fresh water in completions. The cost of response is based on increased cost of water. The infrastructure investment may have a strong ROI.
United States of America	Colorado River (Pacific Ocean)	Physical-Increased water scarcity	Higher operating costs	Possible limitations on surface water use and groundwater withdrawal could lead to	>6 years	Probable	Medium	Alignment of public policy positions with water stewardship goals Infrastructure investment Increased	Low-medium	Continued evaluation and investment in water management strategies, technologies and systems that allow the company to decrease the use of fresh water in completions. The

				project delays.				investment in new technology		cost of response is based on increased cost of water. The infrastructure investment may have a strong ROI.
United States of America	Rio Grande	Physical-Seasonal supply variability/Inter annual variability	Higher operating costs	Seasonal water stress translating to decreased supply, and likely impacts to transportation infrastructure. It could result in limitations to future growth if states have to restrict water use	>6 years	Probable	Low-medium	Alignment of public policy positions with water stewardship goals Infrastructure investment Increased investment in new technology	Low-medium	Continued evaluation and investment in water management strategies, technologies and systems that allow the company to decrease the use of fresh water in completions. The cost of response is based on increased cost of water. The infrastructure investment may have a strong ROI.
United States of America	Mississippi River	Physical-Seasonal supply variability/Inter annual variability	Higher operating costs	Seasonal water stress translating to decreased supply, and likely impacts to transportation infrastructure. It could result in limitations to future growth if states have to restrict water use	>6 years	Probable	Low-medium	Alignment of public policy positions with water stewardship goals Infrastructure investment Increased investment in new technology	Low-medium	Continued evaluation and investment in water management strategies, technologies and systems that allow the company to decrease the use of fresh water in completions. The cost of response is based on increased cost of water. The infrastructure investment may have a strong ROI.
United States of America	Rio Grande	Regulatory-Regulatory uncertainty	Higher operating costs	The potential revision or expansion of regulations on water quality and quantity could result in higher operating costs, increased production cycle time. An example is an increased groundwater sampling requirements.	1-3 years	Probable	Low	Engagement with public policy makers	Low-medium	Effective policy analysis and involvement in legislation/regulatory rule/law-making Dedicated pre-compliance preparation for requirements as well as robust compliance assurance. The magnitude of the financial impact and response cost are expected to be low to medium, based on our strategy to be proactive on water strategies, thus reducing the potential costs of compliance.
United States of America	Susquehanna River	Regulatory-Regulatory uncertainty	Higher operating costs	The potential revision or expansion of regulations on water quality and quantity could result in higher operating costs, increased production cycle time. An example is increased groundwater sampling requirements.	1-3 years	Probable	Low	Engagement with public policy makers	Low-medium	Effective policy analysis and involvement in legislation/regulatory rule/law-making Dedicated pre-compliance preparation for requirements as well as robust compliance assurance. The magnitude of the financial impact and response cost are expected to be low to medium, based on our strategy to be proactive on water strategies, thus reducing the potential costs of compliance.
										Effective policy analysis and



United States of America	Mississippi River	Reputational-Community opposition	Loss of license to operate	Community opposition of the use of water in completions could lead to restriction or loss of Anadarko's ability or license to operate. This could be a result of the need of water for agricultural and municipal uses.	1-3 years	Unlikely	Low-medium	Engagement with public policy makers	Low	involvement in legislation/regulatory rule/law-making. Dedicated pre-compliance preparation for requirements as well as robust compliance assurance. The magnitude of financial risk and response cost is low, since Anadarko has a robust community stakeholder engagement strategy already working to minimize this and other identified risks.
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**W3.2f**  
Please choose the option that best explains why you do not consider your organization to be exposed to water risks in your supply chain that could generate a substantive change in your business, operations, revenue or expenditure

Primary reason Please explain

**Further Information**

**Page: W4. Water Opportunities**

**W4.1**  
Does water present strategic, operational or market opportunities that substantively benefit/have the potential to benefit your organization?

Yes

**W4.1a**  
Please describe the opportunities water presents to your organization and your strategies to realize them

Country or region	Opportunity	Strategy to realize opportunity	Estimated timeframe	Please explain
Company-wide	Cost savings	Innovative water recycling and delivery systems have reduced costs in operations. For example in Colorado, a "water on demand" system has reduced the impact on the community of hauling water, reduced water usage and reduced costs. By constructing 60+ miles of pipelines, there are 96% fewer trucks on the road and 88% fewer storage tanks.	Current-up to 1 year	Anadarko is currently assessing and designing technologies and opportunities to continue to enhance such systems. For example, in four other plays, Anadarko has constructed and continues to enhance water recycling and delivery systems.
United States of America	Improved water efficiency	The increase of water reuse and recycling systems is resulting in improved water efficiency. For example, in Utah a completions system creates temporary staging sites on existing well sites to treat and recycle flow back water, then move it to the next operation for reuse.	Current-up to 1 year	Anadarko is currently installing and operating equipment and systems to increase water recycling and anticipates that it will continue to do so into the future. For example, in West Texas a water recycling system has resulted in the reuse of more than 1 million barrels of produced water. In Pennsylvania, we reuse 100% of flowback water recovered from our operations.
United States of America	Other: Improved water measurement	Improving the ability of the oil and natural gas industry to account for total life cycle water use and generation, through enhanced water measurement. Anadarko has a water technical team currently working on developing a company-wide enhanced water measurement program.	Current-up to 1 year	As cited by Energy In Depth on its website, the combustion of 1 Bcf of natural gas as a source of fuel creates over 11 million gallons, or nearly 42 megaliters of water as vapour, a volume which is not typically accounted for in the measurement of life cycle water management for the oil and gas industry. Anadarko is working with industry to develop a valid approach to evaluating this aspect of the use of natural gas.

**Further Information**

**Module: Accounting**

**Page: W5. Facility Level Water Accounting (I)**

**W5.1**  
Water withdrawals: for the reporting year, please complete the table below with water accounting data for all facilities included in your answer to W3.2a

Facility reference number	Country	River basin	Facility name	Total water withdrawals (megaliters/year) at this facility	How does the total water withdrawals at this facility compare to the last reporting year?	Please explain the change if substantive
Facility 1	United States of America	Mississippi River	Greater Wattenberg Area	7380.52	About the same	
Facility 2	United States of America	Mississippi River	ETX/NLA	3142.15	About the same	
Facility 3	United States of America	Rio Grande	Maverick	11756.96	About the same	
Facility 4	United States of America	Rio Grande	Delaware	2544.77	Higher	Activity increased in the Delaware Basin in 2014.
Facility 5	United States of America	Susquehanna River	Marcellus	1002.30	Lower	Activity decreased in the Marcellus basin in 2014.
Facility 6	United States of America	Colorado River (Pacific Ocean)	Greater Natural Buttes	508.19	About the same	

#### Further Information

#### Page: W5. Facility Level Water Accounting (II)

##### W5.1a

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

Facility reference number	Fresh surface water	Brackish surface water/seawater	Rainwater	Groundwater (renewable)	Groundwater (non-renewable)	Produced/process water	Municipal water	Wastewater from another organization	Comment
Facility 1	5203.67	0	0	1876.15	0	292.52	8.18	0	
Facility 2	459.16	0	0	2622.54	0	0	60.45	0	
Facility 3	8841.88	0	0	2792.18	0	122.90	0	0	
Facility 4	0	0	0	2225.21	0	317.96	1.60	0	
Facility 5	776.26	0	0	0	0	224.60	1.44	0	
Facility 6	0	0	0	161.28	0	273.01	73.90	0	

##### W5.2

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

Facility reference number	Total water discharged (megaliters/year) at this facility	How does the total water discharged at this facility compare to the last reporting year?	Please explain the change if substantive
Facility 1	383.17	Higher	Activity increased in the Wattenberg Basin in 2014.
Facility 2	411.49	About the same	
Facility 3	866.57	About the same	
Facility 4	1916.45	Higher	Activity increased in the Delaware Basin in 2014.
Facility 5	.01	About the same	
Facility 6	9.86	About the same	

##### W5.2a

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

Facility reference number	Fresh surface water	Municipal Treatment Plant	Seawater	Groundwater	Comment
Facility 1	0	0	0	383.17	
Facility 2	0	0	0	411.49	
Facility 3	0	0	0	866.57	
Facility 4	0	0	0	1916.45	
Facility 5	0	0	0	0.01	
Facility 6	0	0	0	9.86	

##### W5.3

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

Facility reference number	Consumption (megaliters/year)	How does this compare to the last reporting year?	Please explain the change if substantive
Facility 1	6997.35	Higher	Activity increased in the Wattenberg Basin in 2014.
Facility 2	2730.66	About the same	

Facility 3	10890.39	About the same	
Facility 4	628.33	Higher	Activity increased in the Delaware Basin in 2014
Facility 5	1002.29	About the same	
Facility 6	498.33	About the same	

**W5.4**

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

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

**Further Information**

**Module: Response**

**Page: W6. Governance and Strategy**

**W6.1**

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

Highest level of direct responsibility for water issues	Frequency of briefings on water issues	Comment
Senior Manager/Officer	Scheduled - monthly	The Vice President of HSE convened a Corporate Water Strategy team to evaluate and assess water strategies and risk for the company. The Vice President of each operating area has direct responsibility over water management.

**W6.2**

Is water management integrated into your business strategy?

Yes

**W6.2a**

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

Influence of water on business strategy	Please explain
Alignment of public policy positions with water stewardship goals	As part of its culture of continuous improvement, Anadarko has worked to decrease fresh water use in its operations by increasing the reuse and recycling of flowback and produced water.
Establishment of a clear water strategy	Anadarko has developed a multi-element water strategy that has resulted in a company-wide Water Summit, with a strategic water action plan to be implemented.
Water resource considerations are factored into location planning for new operations	Anadarko now evaluates water availability, management and disposal options in evaluating exploratory plays, which has led to more long-term planning around water management.
Publicly demonstrated our commitment to water	Anadarko launched an enhanced external website in early 2015, which includes a commitment to water management, in addition to participating in multiple forums to present on our commitment to responsible water management practices.
Greater regulator engagement	Anadarko is leading the Energy Water Initiative (EWI) – a group of 17 companies that is working on technical water matters. The group is engaging with federal, state and local agencies on enhancing water technologies and data. In addition, we have increased our direct engagement with local, state and federal agencies and legislatures on water matters. This is resulting in a greater understanding of potential impacts of future regulations.
Accelerating vital research and development	The Energy Water Initiative was formed to increase knowledge about new technologies and enhance research and development of water treatment and management technologies. This includes encouraging federal agencies and funding organizations to increase financial support for enhanced treatment technologies. We have also created an internal Anadarko Technical Water Working Group that engages together to discuss technologies and request external experts to present on new research and technologies.

**W6.2b**

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

Influence of water on
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business strategy	Please explain
Increased capital expenditure	In certain assets, Anadarko has seen an increase in capital expenditures while it develops the necessary infrastructure to better manage water. For example, in Texas we are increasingly investing in water capital projects to manage water.

**W6.3**  
Does your organization have a water policy that sets out clear goals and guidelines for action?

Yes

**W6.3a**  
Please select the content that best describes your water policy (tick all that apply)

Content	Please explain why this content is included
Publicly available Company-wide Commitment to customer education	Anadarko has an internal multi-level water strategy. We also have a public and company-wide water statement on our website ( <a href="http://www.anadarko.com/Responsibility/Sustainable-Development/HSE/Water-Management/">http://www.anadarko.com/Responsibility/Sustainable-Development/HSE/Water-Management/</a> ). Specifically, we state: "Anadarko recognizes that effective water management and water conservation are essential to developing all energy resources for our world. The availability of water, combined with varying municipal, industrial, agricultural and other demands, affects governments, businesses and individuals in many parts of the world. Anadarko respects water as a natural resource, and where feasible, recycles water used in our operations." In addition, we have begun to present to customers (utilities) that are interested in learning more about how we are continually working to minimize the impacts of our operations on communities and the environment, including water.

**W6.4**  
How does your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) during the most recent reporting period compare to the previous reporting period?

Water CAPEX (+/- % change)	Water OPEX (+/- % change)	Motivation for these changes
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Further Information

Page: **W7. Compliance**

**W7.1**  
Was your organization subject to any penalties, fines and/or enforcement orders for breaches of abstraction licenses, discharge consents or other water and wastewater related regulations in the reporting year?

Yes, not significant

**W7.1a**  
Please describe the penalties, fines and/or enforcement orders for breaches of abstraction licenses, discharge consents or other water and wastewater related regulations and your plans for resolving them

Facility name	Incident	Incident description	Frequency of occurrence in reporting year	Financial impact	Currency	Incident resolution
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**W7.1b**  
What proportion of your total facilities/operations are associated with the incidents listed in W7.1a

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

Impact as % of OPEX	Comparison to last year
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Further Information

Page: **W8. Targets and Initiatives**

**W8.1**  
Do you have any company wide targets (quantitative) or goals (qualitative) related to water?

Yes, goals only

**W8.1b**  
Please describe any company wide qualitative goals (ongoing or reached completion during the reporting period) and your progress in achieving these

Goal	Motivation	Description of goal	Progress
		Develop an internal company-wide	The Strategic Water Committee developed goals and strategies for water management within the company. This group meets several times in a calendar

Other: Internal strategic water planning	Water stewardship	water plan and strategy. This includes assessing Anadarko's water management strategies region-by-region, in order to report on and share ideas and lessons learned.	year. In July of 2014, we initiated a Water Data Mapping project (completed in January of 2015), which involved identifying key water management strategies across key US onshore plays. In late 2014, Anadarko held a company-wide Water Summit (held in April of 2015), to share water strategies, discuss goals moving forward, and share lessons learned.
Other: Internal strategic water strategy implementation	Water stewardship	Implement strategies to increase water-related efficiency and conservation, by increasing its capability of tracking water use and management. This includes developing a data system to better measure: total water volume used; sources of water (surface, groundwater, municipal, etc.); and volume of water recycled, discharged, and injected. From this baseline, the company expects to be able to measure the impact of newly initiated water recycling and conservation programs, in order to accomplish key objectives and expand these programs company-wide. This will also provide a context to inform the company's current analysis of water-related risk throughout its operations.	In July of 2014, we initiated a Water Data Mapping project (completed in January of 2015), which involved evaluating water data management across key US onshore plays. A water data team was formed in December of 2014 to initiate discussions around the development of a company-wide water data system. The team developed goals for 2015.
Other: Continually improve on technologies around water management	Water stewardship	We work to continually improve Anadarko's technological approaches to protect water quality. This is done by encouraging multi-disciplinary teams to work on challenges and problems. We also recognize teams that have made progress on health, safety and environmental goals (including water) through the Safety & Environmental Excellence Program (SEEP).	We have formed a Technical Water Team with representatives across our operations to work together on water challenges and efforts. The following are examples of efforts recognized through the SEEP program: - In Maverick, Texas, the team implemented a spill reduction strategy to protect soil and water. They achieved a 35% decrease in reportable spills, 24% decrease in the amount spilled, and 80% of released water was recovered. - In Maverick, Texas they began operating a water recycling facility that resulted in taking 561,000 truckloads off the roads by constructing 312 miles of pipelines and recycled and reused over 742,000 barrels of water in 2014. - In Wattenberg, Colorado, a water on demand system has resulted in 96% fewer trucks on the road, 88% fewer fracturing tanks, and an increased water use efficiency. - In Pennsylvania, a water recycling system enables us to reuse almost 100% of the flowback water recovered from our operations (when we are completing wells). - In Carthage, Texas, we increased the pipeline system and reduced 40 trucks per day, decreased spills and reduced costs. - In Delaware, Texas, we increased water recycling from 22,000 barrels in 2013 to 2,117,680 barrels in 2014, based on enhancing the water management system. In Vernal, Utah, we operate a Slop Oil facility that separates oil from water, reducing waste generation, cost of management, and truck traffic. This includes reducing the barrels of wastewater hauled to a third party by 60%.
Other: Internal strategic water plan	Recommended sector best practice	Protection of water sources in hydraulic fracturing operations. In order to protect local aquifers, Anadarko is committed to constructing its wells in a manner that meets or exceeds regulatory requirements and industry standards.	Across its U.S. onshore operating areas, the company requires that multiple protective layers of steel pipe, also called casing, and cement be set several hundred feet below the deepest known aquifer and cemented all the way to the surface. The cement must meet certain quality requirements and extend the full length of the casing. These redundant protective boundaries are put in place to establish wellbore integrity. Additionally, the cement's quality and placement is checked and pressure gauges are installed to monitor the well for mechanical integrity once production begins.
Engagement with public policy makers to advance sustainable water policies and management	Recommended sector best practice	Be a leader of the Energy Water Initiative (EWI) effort and ensure that the group meets with key policy makers to advance sustainable water policy.	Anadarko chairs the EWI, which meets with local, state and federal regulators and policy makers to discuss how to advance technical water solutions and opportunities. In 2014, the group completed a Case Studies project that showed water technology trends for the industry for 12 companies. This document has been sent to many policy makers and we were told it is changing the conversation around water technology.
Engagement with suppliers to help them improve water stewardship	Recommended sector best practice	Be transparent in the use of hydraulic fracturing materials	Anadarko supports the public sharing of information regarding additives used in hydraulic fracturing and was instrumental in initiating and developing a hydraulic fracturing disclosure website to publicly share the ingredients used in its hydraulic fracturing activities with the public on an individual-well basis. The website is a cooperative effort among producers, the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission. Anadarko took a leading role in designing and coordinating the Frac Focus website and is the most active participants, with data uploaded for over 5,000 operated wells. The Website may be viewed at <a href="http://fracfocus.org/">http://fracfocus.org/</a>
Other: Internal strategic water plan	Water stewardship	Create Environmental and Social Management Plan (ESMP)	In Mozambique, Anadarko is implementing an ESMP that includes a range of topical areas that impact water quantity and quality, including: labor, camp management, community health, waste management, pollution prevention, and stakeholder engagement.

**Further Information**

**Module: Linkages/Tradeoff**

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

**W9.1**

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

Yes

**W9.1a**

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

Environmental issues	Linkage or trade-off	Policy or action
Water treatment, transportation, and storage required the use of energy.	Trade-off	We regularly assess energy use when evaluating water management options.
Water treatment for reuse can increase the generation of solid waste.	Trade-off	We evaluate the generation of waste as a part of any water management option, and generally water treatment strategies result in a net decrease in waste generation.

**Further Information****Module: Sign Off****Page: Sign Off****W10.1**

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

Name	Job title	Corresponding job category
David McBride	Vice President, Health, Safety and Environment	Environment/Sustainability manager

**W10.2**

Addressing water risks effectively, in many instances, requires collective action. CDP would like to support you in finding potential partners that are also working to tackle water challenges in the river basins you report against. Please select if your organization would like CDP to transfer your publicly disclosed risk and impact drivers and response strategy data from questions W1.4a, W3.2b, W3.2c, W4.1a and W8.1b to the United Nations Global Compact Water Action Hub.

No

**Further Information****Attachments**

[https://www.cdp.net/sites/2015/45/745/Water 2015/Shared Documents/Attachments/Water2015/W10.SignOff/Re CDP Report.msg](https://www.cdp.net/sites/2015/45/745/Water%202015/Shared%20Documents/Attachments/Water2015/W10.SignOff/Re%20CDP%20Report.msg)

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