

**Module: Introduction****Page: W0. Introduction**

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**W0.1****Introduction**

**Please give a general description and introduction to your organization.**

Pinnacle West Capital Corporation is an energy holding company based in Phoenix, AZ with a focus on the business of its primary subsidiary, the Arizona Public Service Company (APS). APS is an investor-owned, vertically integrated power company that generates and delivers reliable electric power and related services to approximately 1.2 million customers located in Arizona. To meet the energy demand of our customers, APS owns and operates a fleet of generation resources, including nuclear, coal, natural gas, and renewable (solar and wind) generation. Additionally, APS owns and operates a transmission and distribution system that is necessary to deliver the power to our customers.

Water is vital for APS to meet its core business objectives. As a result, APS has a Water Resource Management department whose sole purpose is to ensure a sufficient quality and quantity of water is available to meet the current and future needs of our generating stations. The vision of the Water Resource Management department is to secure and maintain a sustainable and cost-effective supply of water to enable reliable energy production for APS customers. The Department's mission is to develop and implement a strategic water resource management program that will provide APS timely and reliable information to manage APS's water resources portfolio in support of the safe and efficient generation of electricity for the long term. This is accomplished through the acquisition of water supplies, alternative supplies, and conservation by the efficient use of water, research and technology, groundwater models, a well and pumping reliability program, water supply contingency initiatives and well field management plans.

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**W0.2****Reporting year**

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

**Period for which data is reported**

Thu 01 Jan 2015 - Thu 31 Dec 2015

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**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

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**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

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**W0.4a**

**Exclusions**

**Please report the exclusions in the following table**

Exclusion	Please explain why you have made the exclusion
Commercial Office buildings and facilities not associated with power	The facilities are excluded because the amount of water used in office buildings is minor in comparison to the amount of water used in power generation and the water is provided from sources that are not at risk of shortages. However, we do

Exclusion	Please explain why you have made the exclusion
generation	monitor and track water usage in these facilities.

**Further Information**

**Module: Current State**

**Page: W1. Context**

**W1.1**

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

Water quality and quantity	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital for operations	Important	Without a sufficient amount of good quality water, the power generation necessary to meet our customer energy demands would not be possible. Large amounts of water are needed for nuclear, gas and coal generation for cooling water make-up, boiler make-up and domestic uses.
Sufficient amounts of recycled, brackish and/or produced water available for use	Vital for operations	Important	Recycled water (treated wastewater) is vital to the operation of the Palo Verde Nuclear Generating Station and to the Red hawk Power Plant. Since our generation resources are located in a desert, recycled water is a critical resource to meet production needs. Recycled water makes up 68 percent of our total water use fleet wide and without sufficient amounts of adequate quality reclaimed water, power generation would only be possible if a different source of water was available. The importance of recycled water will likely increase due to increased competition for scarce water resources in the Southwest desert.

**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	APS measures and monitors 100 percent of our water withdrawals. Power plant water use is measured by direct metering and monthly reports are compiled and evaluated. In some cases this is done daily. This information is provided to management in monthly progress reports and metric target reports. This information is also reported on annual basis to the appropriate agencies for compliance purposes. Other water uses, such as office buildings, service centers, etc. are served by a municipal provider. Because water use is vital for power production, it is important to track actual water usage as a baseline for water goal setting and water conservation purposes.
Water withdrawals- volume by sources	76-100	APS measures and monitors 100 percent of our water withdrawals and identifies the water withdrawals by source. Fleet wide, the plants use a combination of recycled water, groundwater and surface water, all of which are measured by direct metering. In some cases measurement is done daily. This information is provided to management in monthly progress and metric target reports. This information is also reported on annual basis to the appropriate agencies for compliance purposes. It is important to understand the source of the water withdrawal from a watershed impact perspective and as a baseline for goal setting.
Water discharges- total volumes	76-100	APS measures and monitors 100 percent of our water discharge volumes. A portion of our blowdown water is treated then recycled and reused at the plants. The remainder is discharged to a sanitary sewer, discharged to a river or is discharged into evaporation ponds. In some cases measurement is done daily. This information is provided to management in monthly progress and metric target reports. This information is also reported on annual basis to the appropriate agencies for compliance purposes. Discharge data provides a key data point to calculate consumption.
Water discharges- volume by destination	76-100	APS measures and monitors 100 percent of our water discharge volumes by destination. A portion of our blowdown water is treated then recycled and reused at the plants. The remainder is discharged to a sanitary sewer, discharged to a river or is discharged into evaporation ponds. In some cases measurement is done daily. This information is provided to management in monthly progress and metric target reports. This information is also reported on annual basis to the appropriate agencies for compliance purposes. Tracking destination provides data regarding how watersheds may be affected.
Water discharges- volume by treatment method	76-100	APS measures and monitors 100 percent of our water discharge volumes by treatment. A portion of our blowdown water is treated then recycled and reused at the plants. The remainder is discharged to a sanitary sewer, discharged to a river or is discharged into evaporation ponds. In some cases measurement is done daily. This information is provided to management in monthly progress and metric target reports. This information is also reported on annual basis to the appropriate agencies

Water aspect	% of sites/facilities/operations	Please explain
		for compliance purposes. APS maintains procedures of treatment methods by power plant in order to better manage water quality, discharge locations, and the watershed.
Water discharge quality data- quality by standard effluent parameters	76-100	APS measures and monitors 100 percent of our water discharge quality data to ensure effluent quality standards are met. A portion of our blowdown water is treated then recycled and reused at the plant, is discharged to a sanitary sewer, discharged to a river or is discharged into evaporation ponds. In some cases measurement is done daily. This information is provided to management and used throughout the company and is reported to the appropriate agencies. This information is measured and monitored to ensure consistent water quality parameters for power production. Water Quality is a key component of generating electricity in all of power plants.
Water consumption- total volume	76-100	APS measures and monitors 100 percent of our water consumption. Power plant uses are all measured by direct metering and monthly reports are compiled and evaluated. In some cases measurement is done daily. This information is provided to management in monthly progress and metric target reports. This information is also is reported on annual basis to the appropriate agencies for compliance purposes. Other water uses, such as office buildings, service centers, etc. are served by a municipal provider. Our Facility department monitors water consumption in office buildings and service centers.
Facilities providing fully-functioning WASH services for all workers	76-100	APS measures and monitors 100 percent of our water withdrawals and provided facilities with fully-functioning WASH services for all workers.

#### 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	23293	Higher	Water use was higher due to increased generation at the Four Corners Power

Source	Quantity (megaliters/year)	How does total water withdrawals for this source compare to the last reporting year?	Comment
			Plant.
Brackish surface water/seawater	0	Not applicable	None of APS's operations withdrew water from brackish surface water/seawater sources. The total withdraw made from this source is thus not applicable.
Rainwater	0	Not applicable	Withdrawals were not made from sources that capture rainwater at any of APS's operations. As in the previous year, no withdrawals from this source were made which resulted in it being not applicable.
Groundwater - renewable	0	Not applicable	No withdrawals were made from renewable groundwater sources at APS's operations. This is the case for the previous year as well, thus it is not applicable.
Groundwater - non-renewable	22513	Lower	More power was generated in 2015, however, less groundwater was used because there was a shift in our generation mix to less water intensive generation and water efficiency measures were successfully employed.
Produced/process water	0	Not applicable	None of APS's operations withdrew water from produced/process water sources. This is the case for the previous year as well, thus it is not applicable.
Municipal supply	0	Not applicable	None of APS's operations withdrew from municipal supply sources. This is the case for the previous year as well, thus it is not applicable.
Wastewater from another organization	92986	Lower	More power was generated from Palo Verde Generating Station and Red Hawk Power Plant in 2015, however, less effluent was used.
Total	138792	Lower	Overall, more power was generated in 2015, however, less water was used because there was a shift in our generation mix to less water intensive generation and water efficiency measures were successfully employed.

**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	2652	Lower	Less water was returned back into the system in 2015 due to increased cycles of concentration from Morgan Lake at our Four Corners Power Plant.
Brackish surface water/seawater	0	Not applicable	There are no discharges to brackish surface water/seawater.
Groundwater	0	Not applicable	There are no discharges to groundwater.
Municipal/industrial wastewater treatment plant	0	Not applicable	There are no discharges to a municipal/industrial wastewater treatment plant.
Wastewater for another organization	0	Not applicable	There are no discharges of wastewater for another organization.
Total	2652	Lower	Total water discharged in 2015 was 52% lower than in 2014.

**W1.2c**

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

Consumption (megaliters/year)	How does this consumption figure compare to the last reporting year?	Comment
136140	Lower	There was a 1.6 percent decrease in water use from 2014 to 2015. Overall, more power was generated in 2015 than in 2014, however, less water was used because there was a shift in our generation mix to less water intensive generation and water efficiency measures were successfully employed.

**W1.3**

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

Yes

**W1.3a**

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

Proportion of suppliers %	Total procurement spend %	Rationale for this coverage
Less than 1%	26-50	<p>1) Methods of engagement i) Suppliers: Annually, APS engages our top tier suppliers in a sustainability survey, with questions on how they are managing environmental impacts in their operations, including greenhouse gas emissions, energy and water usage, waste, and materials management. 2) Strategy for prioritizing engagements i) Suppliers: Within APS' supply chain, we prioritize our top tier suppliers, our most critical and strategic suppliers and those with whom we spend significant dollars. APS evaluates these suppliers using key performance indicators such as safety, quality and operations, and supplier diversity. 3) Measures of success i) Suppliers: APS defines success in two ways: a year over year increase in supplier response rate to the survey, and a year over year improvement in performance across the key performance indicators. 4) How this information is used i) Information gathered during annual EUISSCA survey is shared with Supply Chain Leadership to develop awareness of our supplier's performance. In the future, information will be used to drive Supplier Relationship Management quarterly discussions.</p>

**W1.3b**

**Please choose the option that best explains why you do not request your suppliers to report on their water use, risks and/or management**

Primary reason	Please explain
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**W1.4**

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

No

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**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
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**W1.4b**

Please choose the option below that best explains why you do not know if your organization experienced any detrimental impacts related to water in the reporting year and any plans you have to investigate this in the future

Primary reason	Future plans
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**Further Information**

**Module: Risk Assessment**

**Page: W2. Procedures and Requirements**

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**W2.1**

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

Water risks are assessed

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**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 corporate water quality policy was established with risk criteria, including shortages due to drought, infrastructure issues, regulatory/legal limits and costs of water. Risk is assessed quarterly and reported to corporate executives/ officers on the strategic options roadmap.

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**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
Six-monthly or more frequently	Facility	>6 years	APS looks at water risks fleet wide and assesses a variety of risks factors based on a 1 to 50 time horizon. We also look at groundwater production well risks every year and have developed a repair and replacement program on a 10 year continuum. We also assessed water supply risks for the next 50 years for the Palo Verde Nuclear Generating Station. We perform or participate in modelling of groundwater supplies to assess future risk associated with both quantity and quality of water supplies.

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#### 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 10 years

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#### W2.4a

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

Water Resource Management evaluates effects on water risk on organizational growth by performing individual plant audits of risk, then compiling these risks into categories such as infrastructure, supply, drought and regulatory/legislative strategies. Strategies are then developed to mitigate risk at the corporate level and are implemented to ensure success. Water related risk is not a constraint on APS growth strategy.

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#### W2.4b

What is the main reason for not having evaluated how water risks could affect the success (viability, constraints) of your organization's growth strategy, and are there any plans in place to do so in the future?

Main reason	Current plans	Timeframe until evaluation	Comment
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**W2.5**

**Please state the methods used to assess water risks**

Method	Please explain how these methods are used in your risk assessment
Other: Acquisition of water supplies and alternative supplies, Conservation by the efficient use of water, Research and Technology, Groundwater models, well and pumping reliability program, Water supply contingency initiative, and Well field management plans	<p>- Acquisition of water supplies and alternative supplies: Since there is an increasing demand and continued pressure on water supplies in the arid Southwest, APS is investing in water to meet the needs of future generation. The diminishing supply of water resources increases the importance of backup supplies for each site. Options for investing in future water supplies include water storage and acquiring groundwater rights.</p> <p>- Conservation by the efficient use of water: There are currently initiatives underway that will help to conserve groundwater such as early retirement of coal units, development of well field operations plans and the implementation of renewable and distributed energy and Energy Efficiency.</p> <p>- Research and technology: With the increased emphasis on water resources in the Southwest, future generating stations will need to consider alternative cooling technologies to reduce consumptive use of water, or alternative water supplies that will likely require pre- and post-treatment.</p> <p>- Groundwater models: APS has contracted with various hydrologic consultants to develop groundwater flow models to help identify more strategic use of water.</p> <p>- Well and pumping reliability program: This program was developed to evaluate critical components of the water supply including groundwater production wells and well infrastructure.</p> <p>- Water supply contingency initiative: Primary and secondary water supplies have been identified for all nine APS owned/operated power plants.</p> <p>- Well field management plans: These plans will result in more efficient use of higher quality groundwater, decreased water consumption, and more strategic use of water resources to avoid outages.</p>

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	We have numerous agreements and contracts with local communities regarding current and future water supplies. Examples of such agreements are the San Juan River Shortage Sharing agreement that ensures that all water users share proportionally in cuts to water supply. Another example is the Joseph City Severance and Transfer agreement that provides a contingent supply of water to the Cholla Power Plant. APS is committed to work with these entities to ensure we all have a safe and reliable supply of water.
Current water regulatory frameworks and tariffs at a local level	Relevant, included	One important aspect of risk assessment at APS is complying with local, state and federal regulatory requirements. APS works with the Arizona Department of Water Resources on state regulations of groundwater and surface water, the Arizona Department of Environmental Quality on water quality regulations, the New Mexico State Engineers Office. Regulatory issues are tracked and reported quarterly or more frequently if needed. Plans have been formatted to address each issue to ensure no impact of water supply.
Current stakeholder conflicts concerning water resources at a local level	Relevant, included	We participate in a number of groups throughout the state that are working to resolve water resource conflicts and issues, including the Governor's Water Augmentation Council, the Groundwater Users Advisory Council, the Kyl Center for Water Policy, and the San Juan River Basin Recovery Implementation Program. We also participate in a critical watershed project at the Four Corners power plant with four national laboratories and the U.S. Bureau of Reclamation to evaluate climate change impacts. The study's title is "Climate Change Impact and Decision Support for Energy Development Planning Under Changing Water Supply Conditions."
Current implications of water on your key commodities/raw materials	Relevant, included	In 2015, APS asked its 100 top tier suppliers to report their water management through the Electric Utility Industry Sustainable Supply Chain Alliance (EUISSCA) Sustainability Survey. These suppliers are about 31% of spend. APS suppliers invited to respond were selected based on prioritizing our top tier suppliers, our most critical and strategic suppliers and those with whom we spend significant dollars. Responding suppliers may state whether their company operates in a region that is currently or projected to be a water-scarce region and if their company's production/service/generation process rely on water availability.
Current status of ecosystems and habitats at a local level	Relevant, included	APS participates on the Biology and Coordinating Committee of the San Juan River Basin Recovery Implementation Program to assist in recovery efforts associated with the endangered Colorado Pikeminnow and Razorback Sucker. APS provides funding for stocking programs, non-native fish removal, protecting and augmenting fish habitat, monitoring endangered fish populations, constructing an in-stream fish passage and evaluating temperature modification studies. APS also participates in the Coconino Plateau Water Advisory Council Committee, modeling Coconino Aquifer withdrawals and protecting the

Issues	Choose option	Please explain
		critical habitat of the Little Colorado Spinedace. APS also works with water users and environmental stakeholders to evaluate potential impacts/mitigation of groundwater pumping on spring flows that provide critical habitat to threatened fish populations.
Current river basin management plans	Relevant, included	The Arizona Department of Water Resources (ADWR) develops Management Plans for the five Active Management Areas in Arizona that regulate groundwater. These plans are updated every 10 years and APS has worked with ADWR to provide clarification on current and future Management Plan requirements including endorsing changes to address different types of generating facilities.
Current access to fully-functioning WASH services for all employees	Relevant, included	All APS workers have full access to fully functioning WASH services at all of our facilities.
Estimates of future changes in water availability at a local level	Relevant, included	In Arizona, water availability is always an issue. APS continuously monitors water availability to all its plants and service centers to ensure there is a safe and reliable supply of water. Water shortages along the Colorado River and the Salt River System have direct and indirect implications to the APS fleet. APS has developed models that predict availability of water and also uses models developed by others for this purpose. Water supplies to support generation are currently sufficient to meet all demands. Contingent supplies are available at each plant. There is no identified risk to future supplies. These systems, as well as groundwater conditions are monitored and assessed on a continuous basis.
Estimates of future potential regulatory changes at a local level	Relevant, included	Arizona water law and federal water laws pertaining to the Colorado River is complex and changes to those laws could have a direct impact to APS and its fleet. Future potential regulatory changes could include completion of the adjudication process in Arizona and New Mexico, changes to the Arizona Groundwater Management Act that could impact how we withdrawal and use groundwater and regulatory changes in water quality standards that could impact cost and our ability to treat water. APS works with the Arizona Department of Water Resources, the Arizona Department of Environmental Quality, the New Mexico State Engineers Office and the Bureau of Reclamation to understand potential regulatory changes and how we can participate in the development of regulatory changes to ensure there is a safe and reliable supply of water.
Estimates of future potential stakeholder conflicts at a local level	Relevant, included	Potential stakeholder conflicts are an important part of risk assessment. Future stakeholder conflicts over water between municipalities, agricultural and industrial users could restrict growth of one or more of these sectors. The stakeholder groups identified are designed to prevent or mitigate adverse impacts associated with water shortages. APS is committed to work with entities at the local level to avoid and resolve conflicts with stakeholders to ensure we all have a safe and reliable supply of water.
Estimates of future implications of water on your key commodities/raw materials	Relevant, included	Water shortages are not anticipated to have an impact on key commodities/raw materials needed to support electric generation.
Estimates of future potential changes in the status of ecosystems and habitats at a local level	Relevant, included	Water shortages could adversely impact endangered species critical habitats in the San Juan River in New Mexico and the Little Colorado River in Arizona. APS works with local stakeholders and environmental groups to develop plans that will remedy adverse impacts.

Issues	Choose option	Please explain
Scenario analysis of availability of sufficient quantity and quality of water relevant for your operations at a local level	Relevant, included	APS has contracted with various hydrologic consultants to develop groundwater flow models to help identify more strategic uses of water. These models assess conditions based on a variety of different water use scenarios to help us understand how different water use practices will affect the water users and the environment in our area.
Scenario analysis of regulatory and/or tariff changes at a local level	Relevant, included	One important aspect of risk assessment at APS is looking at different ways regularity changes will affect plant operations and how can we prepare for those changes and work with the entities to ensure we all have a safe and reliable supply of water. APS works with the Arizona Department of Water Resources, the Arizona Department of Environmental Quality, the New Mexico State Engineers Office and we have numerous agreements and contracts with local communities regarding current and future water supplies. APS is committed to work with these entities to ensure we all have a safe and reliable supply of water.
Scenario analysis of stakeholder conflicts concerning water resources at a local level	Relevant, included	While planning for future water supplies acquisition, APS looks at potential stakeholder conflicts and examines different scenarios to determine if those conflicts can be resolved while still ensuring we have a safe and reliable supply of water. APS evaluates alternative water supplies such as poor quality groundwater that is being considered for development by multiple entities. Scenarios have been developed to either independently pursue the water supply or to work with one or more parties to develop it.
Scenario analysis of implications of water on your key commodities/raw materials	Relevant, included	APS has contracted with various hydrologic consultants to develop groundwater flow models to help identify more strategic uses of water. These models assess conditions based on a variety of different water use scenarios to help us understand how different water use practices will affect our ability to generate electricity for our customers. APS has not identified significant instances where water supply will impact key commodities/raw material. We continue to monitor water and possible future impacts on commodities/raw material.
Scenario analysis of potential changes in the status of ecosystems and habitats at a local level	Relevant, included	APS participates on the Biology and Coordinating Committee of the San Juan River Basin Recovery Implementation Program (SJRIP) to assist in recovery efforts associated with the Colorado Pikeminnow and Razorback Sucker. APS also participates in the Coconino Plateau Water Advisory Council Committee meetings, modelling Coconino Aquifer withdrawals and protecting the critical habitat of the Little Colorado Spinedace. APS participates in these groups because they perform scenario analysis on ecosystems and habitats on our behalf and provide of us with that information. This information is used in conjunction with water planning.
Other	Not evaluated	No comment

**W2.7**

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

Stakeholder	Choose option	Please explain
Customers	Relevant, included	Water risk assessments are performed to minimize risk to our ability to generate power in the interest of our customers. APS does discuss water risk with suppliers or water such as effluent we purchase and those suppliers are also customers.
Employees	Relevant, included	At APS, we are continually educating our employees on water risks to the company. We do this by providing presentation to executive management and Directors. We also work directly with plant operators who are at the plants operating the systems. Water resource staff meets monthly with plant managers, directors, GM's and VPs to discuss the status of water conservation initiatives and actions that the plants can take to minimize water use. Water Resource Management conducted surveys of each plant and provided specific recommendations top reduce water consumption.
Investors	Relevant, included	APS discusses water risks with our partners at all participant owned plants – Palo Verde, Cholla, Yucca and Four Corners. Decisions that reduce risk often involve cost, therefore, must be discussed with co-owner/investors. APS also reports to investors through the Pinnacle West Corporate Responsibility Report and CDP Water questionnaire. APS's risks assessments help eliminate risks that interfere with operations as well as help APS to become a better steward of water resources.
Local communities		APS participates in a number of groups throughout the state to seek solutions to water resource issues including the Governors Water Augmentation Council, the Groundwater Users Advisory Council, the Kyl Center for Water Policy, and the San Juan RIP. We are currently participating in a critical watershed project, the Climate Change Impact and Decision Support for Energy Development Planning under Changing Water Supply Conditions, with four national laboratories and the U.S. Bureau of Reclamation to evaluate climate change impacts.
NGOs	Relevant, included	APS engages with NGOs concerning water risks associated with potential adverse environmental impacts at the Four Corners Power Plant and the Cholla Power Plant. Some NGO's include the Sierra Club and the Nature Conservancy.
Other water users at a local level	Relevant, included	APS engages with legal water users in planning meetings such as the Groundwater Users Advisory Council, Governors Water Augmentation Council, and the Kyl Center for Water Policy. We also interact with local users on the San Juan River to develop a shortage sharing agreement to be implemented following severe drought conditions. groups throughout the state to help resolve water resource issues such as the Governors Water Augmentation Council, the Groundwater Users Advisory Council, the Kyl Center for Water Policy, San Juan RIP and we are currently participating in a critical watershed project with four national laboratories and the U.S. Bureau of Reclamation to evaluate climate change impacts. APS is committed to work with these entities to ensure we all have a safe and reliable supply of water.
Regulators	Relevant, included	APS engages with Arizona Department of Water Resources concerning risk to water supplies in state-wide planning meetings such as the Groundwater Users Advisory Council. APS also engages with the New Mexico State Engineer concerning water supply conditions on the San Juan River and Navajo Reservoir and on shortage sharing.

Stakeholder	Choose option	Please explain
River basin management authorities	Relevant, included	APS works with the U.S. Bureau of Reclamation concerning management of the water supply in Navajo Reservoir. We have participated in three environmental flows workshops designed to balance the needs between commercial, agricultural and environmental interest in the San Juan River Basin.
Statutory special interest groups at a local level	Relevant, included	APS factors in statutory special interest group concerns as they are raised and, based on evaluation, may directly engage with the groups where necessary. APS has been meeting with a variety of groups such as the Governors Water Augmentation Council, the Groundwater Users Advisory Council, the Kyl Center for Water Policy, and the San Juan RIP.
Suppliers	Relevant, included	Supplies are selected based upon their ability to meet the needs of APS power plants while ensuring their products are not at risk of delivery due to water related issues. In 2015, APS also asked its 100 top tier suppliers to report on their water management through the Electric Utility Industry Sustainable Supply Chain Alliance Sustainability Survey. Responding suppliers may state whether their company operates in a region that is currently or projected to be a water-scarce region and if their company's production/service/generation process rely on water availability.
Water utilities/suppliers at a local level	Relevant, included	APS works closely with local water utilities that provide water supplies to our facilities. For example, we work with the City of Phoenix to assure the reliable delivery of recycled water to the Palo Verde Nuclear Generating Station (Palo Verde) and the Redhawk Power Plant (Redhawk). We also work with local utilities that do or could potentially provide water to our facilities, including the Cities of Buckeye and Tolleson that provide water to Palo Verde and Redhawk.
Other	Not relevant, explanation provided	No comment

## W2.8

Please choose the option that best explains why your organisation does not undertake a water-related risk assessment

Primary reason	Please explain

## Further Information

## Module: Implications

### Page: W3. Water Risks

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#### 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

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#### W3.2

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

APS defines substantive change to our business related to water risk in three ways. First, a physical disruption of a water supply constitutes a substantive and disruptive change. If a vital piece of infrastructure is damaged or becomes inoperable, output could be impacted or generation could be curtailed entirely. Second, noncompliance with a permit or regulatory requirement could impact production and/or result notices of violations and penalties. Finally, allocation cuts related to water shortages would impact production.

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#### 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 this represents of total operations company-wide**

Country	River basin	Number of facilities exposed to water risk	Proportion of total operations (%)	Comment
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Country	River basin	Number of facilities exposed to water risk	Proportion of total operations (%)	Comment
United States of America	Other: Phoenix Active Management Area (AMA)	4	91-100	Includes Palo Verde Nuclear Generating Station, Red Hawk Power Plant, West Phoenix Power Plant and Ocotillo Power Plant
United States of America	Other: Pinal Active Management Area (AMA)	1	91-100	Sundance Power Plant
United States of America	Other: Tucson Active Management Area (AMA)	1	91-100	Saguaro Power Plant
United States of America	Other: Joseph City Irrigation Non-expansion Areas (INA)	1	91-100	Cholla Power Plant
United States of America	Other: San Juan River Basin	1	91-100	Four Corners Power Plant
United States of America	Other: Colorado River Basin	1	91-100	Yucca Power Plant

**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	Other: Phoenix Active Management Area (AMA)	% generation capacity	91-100	Includes Palo Verde Nuclear Generating Station, Red Hawk Power Plant, West Phoenix Power Plant and Ocotillo Power Plant
United States of America	Other: Pinal Active Management Area (AMA)	% generation capacity	91-100	Sundance Power Plant

Country	River basin	Financial reporting metric	Proportion of chosen metric that could be affected within the river basin	Comment
United States of America	Other: Tucson Active Management Area (AMA)	% generation capacity	91-100	Saguaro Power Plant
United States of America	Other: Joseph City Irrigation Non-expansion Areas (INA)	% generation capacity	91-100	Cholla Power Plant
United States of America	Other: San Juan River Basin	% generation capacity	91-100	Four Corners Power Plant
United States of America	Other: Colorado River Basin	% generation capacity	91-100	Yucca Power Plant

**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 America	Other: Active Management Area (AMA), Colorado River and San Juan Basin	Other: Physical Disruption of water supply	Plant/production disruption leading to reduced output	Reduced water supplies could result in the loss of generation.	Current-up to 1 year	Probable	Low	Other: Well and Pumping Equipment Reliability Program	Moderate cost increase	Well Failure is a risk that could generate a substantive change in our business. To mitigate this

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
										risk, we established a Well and Pumping Equipment Reliability Program in 2015. The program includes monitoring and testing of groundwater wells, pump testing, and well infrastructure inspection (including pumps and motors, meters and lubrication systems.)
United States of America	Other: Active Management Area (AMA), Colorado River and San Juan Basin	Other: Exceedance of Permit Requirements	Other: Reduction of generation and potential NOV	Reduced water supplies will result in the loss of generation	Current-up to 1 year	Unlikely	Low	Other: Process, procedures, and policies, and initiatives	Minimal cost increase	If a permit requirement is exceeded a notice of violation could be issued that may include monetary fines and changes in our business practices that could generate

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
										a substantive change in our business. To avoid this APS's 3P initiative focuses on building a comprehensive, controlled and structured body of the company's policies, processes and procedures. This tool is used to ensure APS has documented its regulatory requirements in a manner that allows for regulatory compliance.
United States of America	Other: Active Management Area, Colorado River Basin and San Juan River Basin	Regulatory-Statutory water withdrawal limits/changes to water allocation	Plant/production disruption leading to reduced output	Reduced water supplies will result in loss of generation	Current-up to 1 year	Probable	Low	Other: Alternative water supplies and contingency plans	Moderate cost increase	Another significant risk is the potential declaration of water shortages in the southwest. We mitigate this risk by participating

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
										<p>in the San Juan Users Sharing Agreement. APS also developed a severance and transfer agreement with the Joseph City Irrigation Company and the Cholla Power Plant to develop a surface water supply contingency to the groundwater supply. APS mitigates the risk of water shortages by investigating storing water and acquiring groundwater rights for exercise in shortage circumstances for our at-risk facilities. APS has investigated the possibility of acquiring land</p>

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
										for storing water in underground storage facilities for use when other supplies are threatened by drought. APS engages with Electric Power Research Institute under their P-185 water management program. It includes cooling technologies, water treatment technologies and specific power generation effluent treatment technologies.

W3.2d

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

Country	River basin	Risk driver	Potential impact	Description of impact	Timeframe	Likelihood	Magnitude of potential financial impact	Response strategy	Costs of response strategy	Details of strategy and costs
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W3.2e

Please choose the option that best explains why you do not consider your organization to be exposed to water risks in your direct operations that could generate a substantive change in your business, operations, revenue or expenditure

Primary reason	Please explain
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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
Evaluation in progress	The commodities we purchase for power production, such as lime, chemicals, fuels, plant equipment have a demonstrated history of reliability that is not related to water supply. APS will continue to validate this if water supply conditions become more threatened.

W3.2g

Please choose the option that best explains why you do not know if your organization is exposed to water risks that could generate a substantive change in your business operations, revenue or expenditure and discuss any future plans you have to assess this

Primary reason	Future plans
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**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	Other: Water Savings with reduced coal generation and an increase in natural gas and solar generation	Natural gas and solar generation is more water efficient than coal generation 5-10 years	>6 years	APS's closure of coal units (820 megawatts retired since 2013) has resulted in the reduction of water consumption by approximately 20%. We expect to retire an additional 767 megawatts of coal by 2025, which we project to further reduce water consumption at the Cholla Power Plant to less than

Country or region	Opportunity	Strategy to realize opportunity	Estimated timeframe	Please explain
				10% of current consumption. Shift in load from coal to natural gas will result in significant water savings as the water intensity (gallons/megawatt hour) at our gas plants is less than half of the coal plant water intensity. Continued development of renewable energy such as PV solar and wind will reduce fleet wide water intensity and when combined with reduction in coal generation plus the retirement of steam units at Ocotillo and replaced with more efficient combustion turbines, APS expects fleet wide water intensity reductions of 20% by 2025.
Company-wide	Other: Water Investment	Investments to meet future generation needs	Current-up to 1 year	APS investment in water for the future includes purchase of effluent under contracts through 2050 for Palo Verde and Red Hawk, to be extended if needed. It also includes purchase of long term storage credits from the Gila River Indian Community to supply high priority water to the Sundance Power Plant.
Company-wide	R&D	Alternative cooling technologies	Current-up to 1 year	Retirement of steam units at Ocotillo and replaced with more efficient combustion turbines, cooled by hybrid cooling will reduce water consumption significantly. Water intensity will improve from 1000 g/mwh to 100 g/mwh.
Company-wide	Other: Well Pumping and Reliability Program	Infrastructure maintenance and repair	Current-up to 1 year	APS established a Well and Pumping Equipment Reliability Program in 2015 that encompasses critical components of the water supply, including groundwater wells, well testing and inspection, pump testing, well infrastructure inspection (including pumps and motors, meters and lubrication systems).
Company-wide	Other: Well Field Management Plans	Well pumping plans	Current-up to 1 year	In 2015, Well Field Management Plans were developed for a portion of the fleet and are being implemented, tested, and revised. These plans will result in more efficient use of higher quality groundwater, decreased water consumption, and more strategic use of water resources.

W4.1b

Please choose the option that best explains why water does not present your organization with any opportunities that have the potential to provide substantive benefit

Primary reason	Please explain
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W4.1c

Please choose the option that best explains why you do not know if water presents your organization with any opportunities that have the potential to provide substantive benefit

Primary reason	Please explain
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**Further Information**

**Module: Accounting**

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

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W5.1

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

Facility reference number	Country	River basin	Facility name	Total water withdrawals (megaliters/year) at this facility	How does the total water withdrawals at this facility compare to the last reporting year?	Please explain
Facility 1	United States of America	Other: Phoenix Active Management Areas	Palo Verde Nuclear Generating Station	91066	Lower	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". More power was generated at the Palo Verde Generating Station in 2015, however, less reclaimed water was used.
Facility 2	United States of America	Other: Phoenix Active Management Areas	Red Hawk Power Plant	4707	Higher	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". More power was generated at the Red Hawk Power Plant in 2015 resulting in more reclaimed water use.
Facility 3	United States of America	Other: Phoenix Active Management Areas	West Phoenix Power Plant	2694	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Water use was slightly higher in 2015 due to increased generation at the West Phoenix Power Plant.
Facility 4	United States of America	Other: Phoenix Active Management Areas	Ocotillo Power Plant	435	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Water use was slightly higher in 2015 due to increased generation at the Ocotillo Power Plant.
Facility 5	United States of	Other: Pinal Active	Sundance Power Plant	64	Lower	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes

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
	America	Management Areas				between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". More power was generated at the Sundance Power Plant in 2015, however, less water was used.
Facility 6	United States of America	Other: Tucson Active Management Areas	Saguaro Power Plant	36	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Power production at the Saguaro Power Plant almost doubled in 2015, however, the same quantity of water was used.
Facility 7	United States of America	Other: Joseph City Irrigation Non-expansion Areas	Cholla Power Plant	16047	Lower	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". One 260 megawatt coal unit at the Cholla Power Plant was retired in 2015, resulting decreased water consumption.
Facility 8	United States of America	San Juan	Four Corners Power Plant	22955	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Water use at the Four Corners Power Plant was slightly higher in 2015 due to increased generation.
Facility 9	United States of America	Other: Colorado River	Yucca Power Plant	788	Higher	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered

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
						"higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Meters have been installed at the Yucca Power Plant which resulted in identifying higher water withdrawals compared to estimating water withdrawals in previous years.

**Further Information**

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

**W5.1a**

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

Facility reference number	Fresh surface water	Brackish surface water/seawater	Rainwater	Groundwater (renewable)	Groundwater (non-renewable)	Produced/process water	Municipal water	Wastewater from another organization	Comment
Facility 1	0	0	0	0	2360	0	0	88706	More power was generated at the Palo Verde Generating

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
									Station in 2015, however, less reclaimed water was used.
Facility 2	22955	0	0	0	427	0	0	4280	More power was generated at the Red Hawk Power Plant in 2015, resulting in more reclaimed water use.
Facility 3	0	0	0	0	2694	0	0	0	Water use was slightly higher in 2015 due to increased generation at the West Phoenix Power Plant.
Facility 4	0	0	0	0	435	0	0	0	Water use was slightly higher in 2015 due to increased generation at the Ocotillo Power Plant.
Facility 5	64	0	0	0	0	0	0	0	More power was generated at the Sundance Power Plant in 2015, however, less water was used.
Facility 6	0	0	0	0	36	0	0	0	Power production at the Saguaro Power Plant almost doubled in 2015, however, the same quantity of water was used.
Facility 7	0	0	0	0	16047	0	0	0	One 260 megawatt coal unit at the Cholla

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
									Power Plant was retired in 2015, resulting in decreased water consumption.
Facility 8	22955	0	0	0	0	0	0	0	Water use was slightly higher in 2015 due to increased generation at the Four Corners Power Plant.
Facility 9	274	0	0	0	514	0	0	0	Meters have been installed at the Yucca Power Plant which resulted in identifying higher water withdrawals compared to estimating water withdrawals in previous years.

**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
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Facility reference number	Total water discharged (megaliters/year) at this facility	How does the total water discharged at this facility compare to the last reporting year?	Please explain
Facility 1	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".
Facility 2	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".
Facility 3	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".
Facility 4	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".
Facility 5	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".
Facility 6	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".
Facility 7	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".
Facility 8	2652	Lower	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Less water was returned back into the system in 2015 due to higher cycles of concentration from Morgan Lake.
Facility 9	0	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower".

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

Facility reference number	Fresh surface water	Municipal/industrial wastewater treatment plant	Seawater	Groundwater	Wastewater for another organization	Comment
Facility 1	0	0	0	0	0	No comment
Facility 2	0	0	0	0	0	No comment
Facility 3	0	0	0	0	0	No comment
Facility 4	0	0	0	0	0	No comment
Facility 5	0	0	0	0	0	No comment
Facility 6	0	0	0	0	0	No comment
Facility 7	0	0	0	0	0	No comment
Facility 8	2652	0	0	0	0	In 2015, we increased the cycles of concentration at the Four Corners power plant which resulted in less return flow to Morgan Lake.
Facility 9	0	0	0	0	0	No comment

### W5.3

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

Facility reference number	Consumption (megaliters/year)	How does this compare to the last reporting year?	Please explain
Facility 1	91066	Lower	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". More power generated at the Palo Verde Generation Station in

Facility reference number	Consumption (megaliters/year)	How does this compare to the last reporting year?	Please explain
			2015, however, less reclaimed water was used.
Facility 2	4707	Higher	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". More power was generated at the Red Hawk Power Plant in 2015, resulting in more reclaimed water use.
Facility 3	2694	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Water use was slightly higher in 2015 due to increased generation at the West Phoenix Power Plant.
Facility 4	435	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Water use was slightly higher in 2015 due to increased generation at the Ocotillo Power Plant.
Facility 5	64	Lower	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". More power was generated at the Sundance Power Plant in 2015, however, less water was used.
Facility 6	36	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Power production almost doubled at the Saguaro Power Plant in 2015, however, the same quantity of water was used.
Facility 7	16047	Lower	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". One 260 megawatt coal unit at the Cholla Power Plant was retired in 2015, resulting in lower water use.
Facility 8	20303	About the same	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Water use was slightly higher in 2015 due to increased generation at the Four Corners Power Plant.
Facility 9	788	Higher	Year-to-year changes of less than 5% were considered "about the same". Year-to-year changes between 5% and 15% were considered "higher"/"lower". Year-to-year changes over 15% were considered "much higher"/"much lower". Meters have been installed at the Yucca Power Plant which resulted in identifying higher water withdrawals compared to estimating water withdrawals in previous years.

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**W5.4**

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

<b>Water aspect</b>	<b>% verification</b>	<b>What standard and methodology was used?</b>
Water withdrawals- total volumes	1-25	International Standard on Assurance Engagements 3000
Water withdrawals- volume by sources	1-25	International Standard on Assurance Engagements 3000
Water discharges- total volumes	1-25	International Standard on Assurance Engagements 3000
Water discharges- volume by destination	1-25	International Standard on Assurance Engagements 3000
Water discharges- volume by treatment method	Not verified	N/A
Water discharge quality data- quality by standard effluent parameters	Not verified	N/A
Water consumption- total volume	1-25	International Standard on Assurance Engagements 3000

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**Further Information**

Yorke Engineering water verification report attached for verification of water data associated with power production.

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**Attachments**

[https://www.cdp.net/sites/2016/83/14783/Water 2016/Shared Documents/Attachments/Water2016/W5.FacilityLevelWaterAccounting\(II\)/APS CDP Water Verification Report 6-28-16.final \(2\).pdf](https://www.cdp.net/sites/2016/83/14783/Water%202016/Shared%20Documents/Attachments/Water2016/W5.FacilityLevelWaterAccounting(II)/APS%20CDP%20Water%20Verification%20Report%206-28-16.final%20(2).pdf)

**Module: Response**

**Page: W6. Governance and Strategy**

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**W6.1**

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

<b>Highest level of direct responsibility for water issues</b>	<b>Frequency of briefings on water issues</b>	<b>Comment</b>
Board of individuals/Sub-set of the Board or other committee appointed by the Board	Scheduled - twice per year	Don Brandt, the Chairman of the Board, President and Chief Executive Officer of Pinnacle West and Arizona Public Service Company, has the highest level of direct responsibility for water within our organization. Mr. Brandt reviews material water issues twice per year via the SEC reporting process and Board of Director's Top Risk Report.

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**W6.2**

**Is water management integrated into your business strategy?**

Yes

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**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
Other: Water Savings with reduced coal generation and an increase in natural gas and solar generation	Our business plan includes a Tier 1 water conservation metric (Tier 1 metrics provide the highest level of visibility, monitoring, and reporting within the company). Our target within this metric is to reduce our consumption of non-renewable resources by 8-10%, year over year. Our business strategy to accomplish this goal includes the reduction of coal generation and an increase in natural gas and solar generation, as well as an aggressive Well Pumping and Equipment Reliability program.
Other: Water Investment	Because increasing demand and continued pressure on water supplies in the arid southwest is likely, APS has been investing in water to meet the needs of future generation. The diminishing supply of water resources increases the importance of backup supplies for each site. We have invested in long term water supplies for Palo Verde, Red Hawk and Sundance to ensure predictable quantity is available at a reasonable cost.
Other: Research and Technology	APS participates in industry wide research, providing funding and leadership in Electric Power Research Institutes water committees. Supporting research and more efficient cooling and treatment technologies is a corporate business strategy.
Other: Well Pumping and Reliability Program	APS established a Well and Pumping Equipment Reliability program in 2015. The program includes monitoring and testing of groundwater wells, pump testing, and well infrastructure inspection (including pumps and motors, meters and lubrication systems.)
Other: Well Field Management Plans	In 2015, Well Field Management Plans were developed for a portion of the fleet and are being implemented, tested, and revised. These plans will result in more efficient use of higher quality groundwater, decreased water consumption, and more strategic use of water resources.

**W6.2b**

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

Influence of water on business strategy	Please explain
Increased capital expenditure	Our business strategy has been influenced by the rising cost of water. We have decided to apply for a water cost adjustor in the next rate case. In addition, new and existing environmental regulations add costs to plant operations. Acquisition of supplies, treatment and disposal

Influence of water on business strategy	Please explain
	of water is a cost of doing business in the desert southwest that may not be the case for other generating facilities in other parts of the country.

**W6.2c**

Please choose the option that best explains why your organization does not integrate water management into its business strategy and discuss any future plans to do so

Primary reason	Please explain

**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
Company-wide	The water policy guiding APS is the company's strategic water plan. This plan describes initiatives that have been developed to ensure APS secures and maintains a sustainable and cost-effective supply of water to enable reliable energy production for our customers. The plan is company-wide to address water impacts from all operations. It is also made available to all our employees to demonstrate APS's commitment to water stewardship, raise awareness about water issues, and maintain transparency in our internal communications. The plan details the main components of our water resource management program which encompass the acquisition of water supplies, alternative supplies, conservation by the efficient use of water, research and technology, groundwater models, well and pumping reliability program, water supply contingency initiative and well field management plans.

#### W6.4

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

Water CAPEX (+/- % change)	Water OPEX (+/- % change)	Motivation for these changes
-23	87	When compared to 2014, CAPEX decreased by 23% in 2015. Although there were more Capital projects in 2015 than in 2014, the dollar magnitude of the 2015 projects was less than the dollar magnitude of the 2014 projects, thus driving the negative percent change from 2014 to 2015. When compared to 2014, OPEX increased by 87% in 2015 mainly due to outside services and consulting services for well maintenance in the gas & oil power plants.

#### 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?**

No

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**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

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**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, targets and goals

**W8.1a**

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

Category of target	Motivation	Description of target	Quantitative unit of measurement	Base-line year	Target year	Proportion of target achieved, % value
Absolute reduction of water withdrawals	Water stewardship	In 2015, APS created a new Tier 1 water metric designed to reduce the quantity of non-renewable groundwater consumed. The goal to reduce consumption of non-renewable water by 8 percent in 2016 as compared to a 2014 baseline year. The 2017 goal is a 10 percent reduction and the 2018 goal is a 12 percent reduction. We established these targets because 16	% reduction of water sourced from groundwater	2014	2018	0%

Category of target	Motivation	Description of target	Quantitative unit of measurement	Base-line year	Target year	Proportion of target achieved, % value
		percent of our fleet's water demand is supplied from groundwater. Initiatives are underway to conserve groundwater, including early retirement of additional coal units, implementation of well field operations plans, and implementation of Renewable Energy, Distributed Energy and Energy Efficiency.				
Other: Water Intensity	Other: Intensity of water use in operations	APS plans to reduce fleet wide water intensity by 20 percent by 2025. This will be accomplished by retiring older water intensive units and replacing them with more efficient units, increasing use of solar photo-voltaic and wind, energy efficiency and implementing water conservation plans at all power plants.	Other: Gallons per megawatt hour	2014	2025	0%
Other: Reduce unplanned well failures	Other: Unanticipated failures of aging production wells and/or pipeline failures could threaten water required to support generation	APS owns and operates 44 production wells that provide cooling water and supplemental water to support generation at eight of nine power plants. Unplanned well failures can occur as a result of pumping equipment failure, electrical/mechanical issues, well casing problems, or human performance errors. These failures disrupt scheduled maintenance plans, result in unplanned/unbudgeted costs, and could result in loss of water necessary to support generation. Water Resource Management (WRM) established a goal for 2015 of no more than 8 percent unplanned production well failures.	Other: Percent failure rate	2014	2017	75%

**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
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Goal	Motivation	Description of goal	Progress
Other: Well Water Quality	Other: Improve Efficiency and reduce water consumption	At Cholla, APS modelled water use, developed a well field operation plan and provided water conservation recommendations. APS also developed a plant operations plan that included evaluation of water quality at each well.	Recommendations were made to prioritize well pumping based upon water quality in order to improve efficiency and reduce water consumption.

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W8.1c

Please explain why you do not have any water-related targets or goals and discuss any plans to develop these in the future

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**Further Information**

**Module: Linkages/Tradeoff**

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

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W9.1

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

Yes

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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
CCR Rules - The Coal Combustion Residual (CCR) rules require closure of unlined ponds three years after operations cease.	Linkage	APS is working to minimize the quantity of water sent to the ponds to meet the coal combustion residual rules.
PM-10 - Palo Verde Nuclear Generating Station and Redhawk Power Plant are located in Maricopa County, Arizona; a non-attainment area for PM-10. Therefore, cooling tower emissions are limited. At the same time, the Arizona Department of Water Resources cooling tower water efficiency requirements require cycling up cooling tower circulation water prior to blowdown.	Linkage	APS has identified that 25 cycles of concentration meets the requirements of the Arizona Department of Water Resources and also the PM-10 requirements of the non-attainment area.
Water and energy are closely connected	Linkage	APS has been keenly aware of what the nation has come to know as the 'water-energy nexus' for many years. That it takes water to generate power and it takes power to treat and deliver water is a well understood concept in the Arizona desert. Whether for creating steam to drive the turbines in coal-, natural gas- or nuclear-powered generating units or for cooling the equipment in combustion turbine units, all electric generating plants use water. Since water is such a precious commodity in the desert Southwest, it is imperative that APS uses it as efficiently as possible. At our Ocotillo Power Plant, APS elected to replace two old steam units that are fairly water intensive, with new combustion turbines that incorporate hybrid cooling, a technology that will result in a 80% decrease in water consumption. We will continue to decrease water intensity as we expand our renewables portfolio. To date, APS has a diverse portfolio of existing renewable resources totalling 1,278 MW, including solar, wind, geothermal, biomass and biogas. APS's strategy to achieve its RES requirements includes executing purchased power contracts for new facilities, ongoing development of distributed energy resources and procurement of new facilities to be owned by APS. Finally, APS's energy efficiency programs reduce the energy needed by our customers, and reduce the need to supply water-intensive generation.

**Further Information**

**Module: Sign Off**

**Page: Sign Off**

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**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
Ann Becker	Vice President, Environmental & Chief Sustainability Officer	Other: Vice President, Environmental & Chief Sustainability Officer

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**W10.2**

Please select if your organization would like CDP to transfer your publicly disclosed response strategy from questions W1.4a, W3.2c and W3.2d to the CEO Water Mandate Water Action Hub.

No

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**Further Information**

**CDP 2016 Water 2016 Information Request**