

# LOOKING TO THE FUTURE

## A STRATEGIC WATER PLAN FOR THE WEST VALLEY



City of Goodyear

Mark Holmes, *Water Resources Manager*

Arizona State University

J. Leah Jones and Rachael Rosenstein

December 2017

## TABLE OF CONTENTS

Executive Summary .....	3
Background .....	5
Overview of Current State and Research Methods .....	6
Methodology .....	6
Current Plan and Challenges for Future Water Use .....	7
The City of Goodyear .....	7
The City of Avondale .....	8
The City of Peoria .....	8
Conclusion .....	9
Best Practices with Comparable Regions .....	9
WESTCAPS Strategic Plan .....	9
East Valley Water Association .....	10
Recommendations .....	11
Recommendation 1: Create Policy Recommendation .....	12
Recommendation 2: Formal Evaluation of Recommendations .....	12
Recommendation 3: Outdoor Water Use Recommendations .....	12
Conclusion .....	13
References .....	14
Appendices .....	15
I. Scope of Work .....	15
II. Logic Model .....	17
III. Communication Strategy .....	18

## EXECUTIVE SUMMARY

### Problem Statement and Current Role of the WVWA

The Phoenix area faces many challenges surrounding water resources; with a semi-arid climate, there is limited water availability. Though there are four main sources of water for the metropolitan area (the Salt and Verde Rivers, the Colorado River through the Central Arizona Project (CAP) canal, groundwater, and effluent from wastewater), most of these sources are already fully allocated, and there are few, if any, options for additional water sources. Further, climate projections expect drought to persist, if not worsen, thus decreasing the availability of surface water resources. Lastly, the Phoenix area population is rapidly increasing, putting further stress on water resources.

The Phoenix West Valley faces all these challenges. Specifically, much of the West Valley does not have access to water from Salt River Project (SRP)—a water utility that holds the majority of surface water rights from the local Salt and Verde Rivers. Additionally, much of the West Valley also does not have direct access to their CAP allocation and must pump it underground north of Phoenix, receive groundwater storage credits, and pump out local groundwater using those credits. Furthermore, much of the projected population growth in Phoenix is expected to be concentrated in the West Valley (Haldiman, 2014). Under “business-as-usual” conditions, the West Valley is expected to have a shortage of up to 550,000 acre-feet of water as the maximum build-out population of 4 million people is approached.

The West Valley is attempting to solve this problem through a regional approach to water management. WESTCAPS was initially formed in 1997 “for advancing and managing regional collaborative water resource projects and programs” in the West Valley (West Valley Water, n.d.; *Factsheet*, 2017). In 2017, however, WESTCAPS was reimaged into a new organization, the West Valley Water Association (WVWA). The original WESTCAPS was focused purely on planning and had limited power to influence decisions or conduct research. The new WVWA is now able to focus on both water planning efforts and taking action with actual projects and governmental influence. It is becoming an effective actor in managing water in the West Valley.

In order to succeed in their efforts, the WVWA is seeking to design a new strategic plan. To do so, Mark Holmes, the Water Resources Manager of the City of Goodyear, enlisted the help of students in a class at Arizona State University’s School of Sustainability. To complete this project, we used literature review, document analysis, and interviews to analyze the current challenges in water management with the expected buildout projection, to review strategic plans from several multi-county water organizations, and to propose recommendations for a strategic plan for the WVWA.

### Challenges of the West Valley

The cities of Goodyear, Avondale, and Peoria provide good case examples of the typical water management challenges facing most of the West Valley. All three cities are confronted with significant projected buildout conditions and increasing populations moving into the future. Additionally, none of them have direct access to their allocated CAP water.—Each of these three West Valley cities is aware of the inevitable water challenges that they will face as populations continue to increase in an ever-drier region, and they have all drafted and/or implemented legislation regarding water management that tackle both the supply and demand sides. Furthermore, both the City of Goodyear and the City of Avondale expressed their great concern regarding outdoor water demand and the need to address this.

## Overview of WESTCAPS and EVWF Strategic Plans

*WESTCAPS:* The original multi-city water management organization in the West Valley, WESTCAPS was initially created with a strategic plan to be operated as a planning organization. Its initial strategic plan centers around three main goals: marketing, branding, and communications; advocacy and lobbying; and policy and planning (WESTCAPS, 2016). Though it does not directly have regulatory or policy power, these strategies and goals would allow WESTCAPS to informally influence decision-making regarding water management. However, this strategic plan lacks a major aspect: it does not include taking action.

*East Valley Water Forum:* The East Valley Water Forum's (EVWF) mission is to develop and implement a regional water management plan to consider water quantity and quality. On the sub-regional level, the East Valley faces the water challenges of depleted groundwater resources and additional water stress caused by drought conditions. Regarded as an organizational strength, the EVWF has created several technical reports and made policy and planning recommendations regarding ways in which water can best be managed for current and future projections (EVWF, 2007; EVWF, 2011). Other strengths include that the EVWF includes a variety of stakeholder types and that it is an organization with voluntary participation that works around specific issues within the East Valley, operating without top-down authority. One of the EVWF's weaknesses is that there is not a formal evaluation of how their recommendations were used and what outcomes were produced as a result.

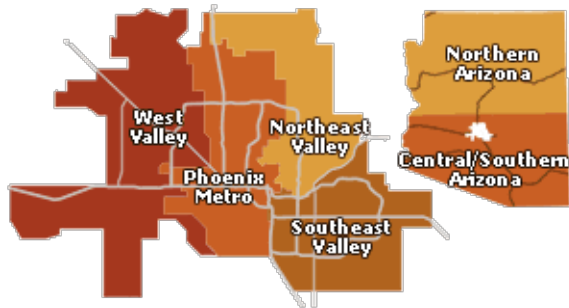
## Recommendations

As the WVWA seeks to create their strategic plan, much can be learned from similar water management multi-county organizations. Based on the study of the problems in West Valley cities and the structures of other multi-county organizations, three recommendations for the strategic plan for WVWA are proposed.

1. *Create policy recommendations with the goal of influencing regional policy to work towards greater water security in the West Valley:* Studies and research should include clear policy recommendations that can push research findings into regulatory action. These recommendations should include specific activities and options of how to achieve recommended policy changes. Evaluation of the effectiveness of the policy recommendations should be conducted in order to assess how they affected policy.
2. *Provide an organizational structure to assess management plans and implementation:* There should be checkpoints throughout all stages of an idea, whether it dies on the drawing board or succeeds all the way to become a local policy. This constant evaluation will ensure only the most promising recommendations continue on and allow for reflection on what will or will not be successful in the West Valley.
3. *Target factors that influence outdoor water usage in the West Valley:* The WVWA should work with the local and state governments, plumbing companies, and manufacturers to push through plumbing code legislation. Further, an organization such as the WVWA could step in and encourage HOAs to review and revise their policies to not only include, but encourage natural/desert landscaping.

## BACKGROUND

The Phoenix metropolitan area in Arizona is located in a valley with semi-arid climate, causing a never-ending challenge for a valuable resource: water. With over 4.3 million people living in the region and a high growth rate, Phoenix and the surrounding cities continually faces the challenge of securing enough water to support its residents. Other than the City of Phoenix itself, there are over 30 cities and towns in the Valley which can generally be divided into two main geographic groups: the East Valley and the West Valley.



The water supply in the Phoenix area consists of four main sources. The first is surface water from the Salt and Verde Rivers, which is allocated by a “first in time, first in use” surface rights allocation. This means that stakeholders who first resided in the Phoenix valley (including Native American tribes, earlier settlers, and the Salt River Project (SRP) water utility) have rights to the surface water. The second is Colorado River water which is transported through canals via the Central Arizona Project (CAP) from the border of Arizona. The third is groundwater which is monitored through the Groundwater Management Act which seeks to reduce the over-extraction of groundwater. Lastly is effluent from wastewater. Phoenix area water demand mainly comes from municipal use, agriculture, Native American communities, and industrial uses, respectively (Larson, Wiek, & Withycombe Keeler, 2013).

Several pieces of legislation and governance affect the use of water in the Phoenix area. The main policy is the

Groundwater Management Act of 1980, which is overseen and managed by the Arizona Department of Water Resources (ADWR). This Act created active management areas (AMAs) around the state’s largest cities, such as Phoenix. Several of the Act’s regulations that are most relevant include that:

- There can be no water allocated to new agriculture within the AMA;
- Groundwater must be used at a rate of safe yield by 2025; and
- There must be a 100-year assured water supply for any future municipal build-out within an AMA.

Beyond the regulations of the Groundwater Management Act, surface water rights affect the supplies allocated throughout the valley. The main rights-holder of local surface water is the Salt River Project (or SRP, a regional water and power utility company), which provides municipal water to residents in many of the cities around the metropolitan area, and the enforcement of surface water rights is overseen by legal procedures. Additionally, water from the Colorado River is allocated by the CAP to each of the cities in the valley, often transported directly from the CAP canal to the city or through groundwater storage credits (Larson, Wiek, & Withycombe Keeler, 2013).

Though there is established governance and legislation regarding water management in the region, water continues to be a challenge in the Phoenix area. There are few, if any, options for additional water sources and many of the existing sources are already fully allocated and used by urban centers or the economically-large agricultural sector of the state. Future climate projections expect the drought in the Colorado River basin to persist, if not worsen, thus decreasing the availability of Colorado water that much of Phoenix relies on through the CAP. And since Arizona is the largest

growing state in terms of population, with that population being centered in the Phoenix valley, water resources are continuing to be stretched to their limits. With all of these challenges, and the expectation that they will continue to increase, strategies must be created in order to adapt for a growing population and continue to provide adequate water for all residents and uses.

## **OVERVIEW OF CURRENT STATE AND RESEARCH METHODS**

The specific water problems that the West Valley faces somewhat vary from those impacting the entire Phoenix area. The main difference is in access. Despite being allocated a portion of CAP water, most of the West Valley does not have direct access to that source. Building canals to transport the water would be a huge financial investment that would only continue to hemorrhage money through evaporation losses. Instead, the cities have to recharge water underground in northern Phoenix, gaining groundwater storage credits, and then pump out local groundwater using those credits. Similarly, the majority of the West Valley also cannot access SRP water, meaning they do not have access to local surface water rights and the supply, treatment, and delivery services that SRP offers. Another problem comes from what we do not usually think of as an issue: population growth. Between 2000 and 2010, the West Valley's population increased 69%, and the area is projected to continue growing faster than other parts of the Phoenix valley (Haldiman, 2014). This will put a greater stress on the existing water sources, and in combination with low and decreasing access to water, creates an unpleasant water situation for the West Valley moving forward. The exact statistics of per capita water decline will be released in the basin study of the West Valley sub-basin that is currently being conducted by the West

Valley Water Association (West Valley Water, n.d.)

Rather than the current “business-as-usual” approach of each city in the West Valley attempting to solve this problem on their own, a more coherent and regional approach needs to be taken. This is not a new concept; WESTCAPS was formed in 1997 “for advancing and managing regional collaborative water resource projects and programs” (West Valley Water, n.d.; *Factsheet*, 2017). In 2017, however, WESTCAPS was reimaged into the current organization, the West Valley Water Association (WVWA). The original WESTCAPS was purely planning-focused and had limited autonomous power to influence decisions or conduct research. The new WVWA is now able to focus both on water planning efforts and take action with actual projects and governmental influence. It is becoming a real, effective actor in managing water in the West Valley.

In order to succeed in their efforts, the WVWA needs to revamp their goals, positions, and representation of the Valley – to design a new strategic plan. Mark Holmes, the Water Resources Manager of the City of Goodyear, has recognized this challenge and thus enlisted the help of students in an urban sustainability class at Arizona State University's School of Sustainability. Mr. Holmes tasked the group with examining the current structure of the WVWA, researching other cities' and water associations' strategic plans and water management strategies, and synthesizing the collected information to create a strategic plan and water management recommendations for the WVWA. These objectives are outlined in the scope of work (see Appendix I).

### **Methodology**

We used literature review, document analysis, and interviews in order to best understand the problems facing the West Valley and to provide recommendations for a

strategic plan. We reviewed literature from the Decision Center for a Desert City (DCDC) at ASU, a research organization that studies decision-making and water management to bridge the boundary between scientists and practitioners (Decision Center for a Desert City, 2017). We conducted document analysis on the general water plans for the City of Goodyear and the City of Peoria, on the management plans from the East Valley Water Forum, and on the existing strategic plan from the former WESTCAPS. We also conducted interviews with members of the public works department for the City of Goodyear and the City of Avondale, and with a member of DCDC. Using these primary and secondary sources, we analyzed the current challenges in water management with the expected buildout projection, reviewed strategic plans from several multi-county water organizations, and proposed recommendations for a strategic plan for the WVWA.

## CURRENT PLAN AND CHALLENGES FOR FUTURE WATER USE

The West Valley of the Phoenix metropolitan area faces several challenges regarding water resources. High projected population growth across the West Valley and many cities' lack of access to CAP and/or SRP surface water makes the future of water resources greatly stressed within the sub-region. With expected build-out projections, the West Valley would have an unmet water demand of about 550,000 acre-feet in the future under business-as-usual circumstances. This projected unmet demand highlights the gravity of the water issues currently facing the West Valley. We looked at three cities in the West Valley – the City of Goodyear, the City of Avondale, and the City of Peoria – in order to better understand the specific challenges that the cities face and the steps they are currently taking to address the

expected future challenges with water management. These cities were chosen as they provide good case examples of the typical water management challenges facing most of the West Valley.

### The City of Goodyear



Goodyear faces the same challenges as the majority of the West Valley. With high population growth rates, the water challenges of the city will continue to be exacerbated; it is expected that Goodyear will not have enough water to account for future projected buildout (City of Goodyear's Integrated Water Master Plan 2016, 1.3.3). In 2015, a population of about 49,000 was serviced by city water and that number is expected to grow to 73,000 people by 2025. Under buildout conditions (from 2085 and beyond), the city is projected to reach a population of 718,000 people being serviced by city water (City of Goodyear's Integrated Water Master Plan 2016, 2.2.5-2.2.6). Additionally, the city does not have direct access to CAP water, though they are given an allocation of that water. Through the Central Arizona Groundwater Replenishment District (CAGRDR), a department of Central Arizona Water Conservation District, a method for demonstrating a 100-year assured water supply for new development is given to water providers and landowners. The CAGRDR recharges much of Goodyear's CAP allocation to offset groundwater pumping within the city. However, because groundwater is highly localized and CAGRDR's recharge of CAP water occurs *outside* Goodyear's city boundary, local groundwater levels *within* the City's boundary may continue to decline.

In order to address these challenges within the city, Goodyear's 2016 Integrated Water Master Plan includes steps to increase the water supply and decrease water demand. To increase the water supply, the Plan

provides recommendations such as acquiring direct access to CAP water or treating wastewater to potable levels, but these recommendations present their own challenges (City of Goodyear's Integrated Water Master Plan 2016, 1.1.3). For example, building a canal from the CAP to the City of Goodyear would cost millions of dollars and a notable amount of water would be lost to evaporation. On the other hand, recommendations to reduce water demand mainly focus on a large decrease in outdoor water use (City of Goodyear's Integrated Water Master Plan 2016, 1.1.3). Over the past several decades, despite a population increase in the Phoenix area, municipal water use has decreased as per capita water use has decreased due to changes in codes on indoor plumbing and fixtures. Specifically, per capita water use in Goodyear decreased by 28 gallons per person per day from 2009 to 2014 (City of Goodyear's Integrated Water Master Plan, 2016, 2.3.2.4). Thus, future conservation efforts focused on outdoor water usage are recommended in the City's general plan.

### **The City of Avondale**



At more than quadruple the population density as Goodyear, the City of Avondale could face the same, if not worse, water supply challenges.

Avondale's population has already increased more than expected; in 2015, mayor Kenn Weise predicted the 2020 population would be 80,330, but it had already reached 82,800 by 2016 (The Republic, 2015; United States Census Bureau: Data, 2016). Avondale's main source of water is the CAP. Rather than bringing the water through canals which would create transport and evaporation charges, like in Goodyear, Avondale uses the method provided by the CAGRID. Avondale also has access to SRP water, however until this point they have been able to meet their

water demand solely using CAP and their effluent credits of which they reuse close to 100% (Interview with City of Avondale, 2017). This reuse is helpful as the City does not need to search for more water sources.

Like Goodyear, the City of Avondale's largest water concern is outdoor water demand; the impactful indoor water use codes have yet to be translated to outdoor use. Nonetheless, Avondale predicts that even with their projected growth they will be able to meet future water demands (Interview with City of Avondale, 2017). With the WVWA, Avondale is currently working on the basin study to more accurately analyze their water situation and related policy measures. The results thus far have shown that there needs to be collaboration between West Valley cities regarding their joint water usage, and recommends using a more central recharge station.

### **The City of Peoria**



Also straining their water resources, the City of Peoria has about double the population density as the City of Goodyear. Like the other cities, Peoria expects their 164,173 people (2016) to grow to approximately 214,500 by 2020 (The Republic, 2015; United States Census Bureau, 2016). The majority of Peoria's water comes from recovered well water, SRP surface water, and CAP surface water (Environmental Resources Division (ERD), 2017). Knowing of the impending water shortages with a growing city, the City Council adopted the Principles of Sound Water Management in 2007 and the Public Works – Utilities Department enacted a Drought Management Plan (DMP) in 2017 (ERD, 2017). In their DMP, they discuss regional challenges of their water sources, including the likelihood that the Colorado River will have shortages, that there may be reductions in SRP allocations due to



shortages, and that their groundwater is being over-pumped to the point of possible depletion (ERD, 2017).

To alleviate these concerns and attempt to prepare for what seems to be inevitable, in their drought protection strategy, Peoria aims to continue recharging groundwater which they believe will last the City through any likely shortages (ERD, 2017). Their overall DMP focuses on providing safe water to the public, maintaining the economy, and having this plan ready to implement should any water shortage or drought occur in Peoria. Like Goodyear and Avondale, what seems to be missing is a fully functional, integrated, regional plan for cities to work together in these situations to ensure enough safe water for all future citizens.

### **Conclusion**

Each of these three West Valley cities is aware of the inevitable water challenges that they will face as populations continue to increase in an ever-drier region. Not only are they cognizant, but the cities have each drafted and/or implemented legislation regarding water management tackling both the supply and demand side; however, this may not be enough going into the future. Although in many cases water rights are strictly defined, it is a convoluted and complicated system, if for nothing else, because water crosses jurisdictional city borders and future levels are difficult to accurately predict. As stated before, we argue that the West Valley needs a dependable and sound regional and collaborative water association to better manage water use throughout the area. This is what we hope to make the West Valley Water Association.

## **BEST PRACTICES WITH COMPARABLE REGIONS**

This idea of regional management is not new. We analyzed the existing WESTCAPS strategic plan and researched existing regional water associations - including successes and failures - to best formulate a strategic plan for the WVWA. Table 1 provides a visual comparison of these organizations.

### **WESTCAPS Strategic Plan**



The original multi-city water management organization in the West Valley, WESTCAPS, was initially created in 1997 with a strategic plan to be operated as a planning organization. Before the organization's transition from WESTCAPS to the WVWA, an initial strategic plan was created and it centers around three main goals: marketing, branding, and communications; advocacy and lobbying; and policy and planning (WESTCAPS, 2016). These three goals are important for the initial stages of a multi-city organization. WESTCAPS will establish social capital and credibility with public and private entities within the sub-region, as well as give itself a credible standing in the governance realms. Though it does not directly have regulatory or policy power, these strategies and goals would allow WESTCAPS to informally influence decision-making regarding water management. However, this strategic plan lacks a major aspect: it does not include taking action. This gap is one in which the newly formed WVWA hopes to fill through conducting research, establishing projects, and directly influencing policy and decision-making.

### East Valley Water Association

The East Valley Water Forum (EVWF) is an organization present in the Phoenix metropolitan area's East Valley with the goal of addressing sub-regional water issues. Formed in 2001, their mission is to develop and implement a regional water management plan to consider water quantity and quality. On the sub-regional level, the East Valley faces the water challenges of depleted groundwater resources and additional water stress caused by drought conditions. Thus, with a common sub-regional goal, the EVWF created several technical reports surrounding groundwater modeling and scenario planning for future projections of water availability under various drought conditions (EVWF, 2007). Additionally, the organization has made policy and planning recommendations regarding ways in which water can best be managed for current and future projections (EVWF, 2007; EVWF, 2011).



The East Valley faces many of the challenges of a desert city--growing populations with limited water resources--however, unlike the West Valley, the East Valley has direct access to their CAP allocation, providing them with a more direct access to water. Additionally, though previous populations have bloomed in the East Valley, future populations are projected to be more concentrated in the West Valley area. Despite these differences in jurisdiction and water needs, strategies from the EVWF can be incorporated into the new WVWA strategic plan.

One of the EVWF's strengths is that it is a multi-city organization that includes a variety of stakeholders (e.g., cities and towns, Native American communities, SRP, etc.). While water is a local issue, challenges in water management are not necessarily confined to political boundaries or to a specific type of stakeholder. Creation of an integrated, cross-boundary organization allows for different perspectives to be heard to reduce unintended consequences and better understand the complexity of the system of interest.

Another strength of the EVWF is that they create reports based on scientific findings and provide recommendations of activities and policy specific to temporal and spatial issues within the East Valley. These recommendations allow for good communication between the EVWF and organizations or individuals who are not directly involved in it, and the scientific findings provide evidence that supports the recommendations that are given and provides credibility to the EVWF and their work. Finally, the EVWF is an organization with voluntary participation that works around specific issues within the East Valley, and operates without top-down authority. This prevents strong disagreement between the organization and the city, as they all choose to work together (Interview with DCDC expert, 2017).

However, the EVWF does have some weaknesses. For one, there is not a formal evaluation of how their recommendations were used and what outcomes were produced as a result. Evaluation protocol to understand the effectiveness of the organization and their research products would be useful for a dynamic organization to continue improving over time. Additionally, the organization only meets when a report or study is being conducted instead of meeting on a consistent basis. While this does allow the organization to invest on specific, needed research and

projects, it also makes it challenging to reach their long-term goal of water security as

effort is not continuously being put towards achieving it.

Table 1: Comparison of the analyzed regional water organizations.

	<b>WESTCAPS</b>	<b>East Valley Water Forum</b>
<b>Mission Statement</b>	“To develop a cost effective, quality water supply; engage in water resource planning and management; and develop regional partnerships for water in the West Valley.”	“To develop and implement an East Valley water resource plan which incorporates a regional approach to water quantity and water quality planning.”
<b>Area of Association</b>	West Valley of Phoenix, AZ	East Valley of Phoenix, AZ
<b>Water Challenges</b>	<ul style="list-style-type: none"> <li>- Growing population</li> <li>- Limited access to surface water sources</li> </ul>	<ul style="list-style-type: none"> <li>- Groundwater depletion</li> <li>- Water stress from projected drought conditions</li> </ul>
<b>Water Sources</b>	<ul style="list-style-type: none"> <li>- Groundwater</li> <li>- Reclaimed water</li> </ul>	<ul style="list-style-type: none"> <li>- Groundwater</li> <li>- SRP surface water</li> <li>- Colorado River water via the CAP</li> <li>- Reclaimed water</li> <li>- Roosevelt Water Conservation District surface water</li> <li>- New conservation space in Roosevelt Dam</li> </ul>
<b>Strategic Plan Strategies</b>	<ul style="list-style-type: none"> <li>- Marketing, branding, and communications</li> <li>- Advocacy and lobbying</li> <li>- Policy and planning</li> </ul>	<ul style="list-style-type: none"> <li>- Work collaboratively to achieve sustainable management of groundwater</li> <li>- Promote the use of renewable supplies</li> <li>- Emphasize the principles of 'safe-yield' groundwater pumping</li> </ul>
<b>Recommendations</b>	<i>Not applicable</i>	<ul style="list-style-type: none"> <li>- Work to secure additional surface and reclaimed water supplies in order to reduce dependence on groundwater until needed during severe drought conditions</li> <li>- Work collaboratively to manage regional groundwater levels</li> </ul>

## RECOMMENDATIONS

As the WVWA seeks to create their strategic plan, much can be learned from similar water management multi-county organizations. Based on the study of the problems in West Valley cities and the structures of other multi-county

organizations, three recommendations for the strategic plan for WVWA are proposed.

### **Recommendation 1: Create Policy Recommendation**

*Goal: Influencing regional policy to work towards greater water security in the West Valley.*

Conducting projects, regional studies, and research are important for water sustainability, but much change will need occur through regulatory and governmental bodies. Therefore, studies and research should include clear policy recommendations that can apply research findings into regulatory action. This allows for policy makers, city council, and other decision-makers not familiar with water management to better understand governing actions that can be taken in order to increase water security. Additionally, policy recommendations should include specific activities and options of how to achieve recommended policy changes (e.g., if the recommendation is to decrease outdoor water use, provide options of how outdoor water use can be decreased). This provides flexibility for cities and other regulatory bodies in how they choose to achieve the goal or recommendation. Finally, evaluation of the effectiveness of the policy recommendations should be conducted in order to assess how they affected policy. This provides the opportunity to improve future policy recommendation processes. This strategy allows the sub-regional water organization to remain dynamic and continue improving so as to make the biggest possible impact on policy.

### **Recommendation 2: Formal Evaluation of Recommendations**

*Goal: Providing an organizational structure to assess management plans and implementation.*

Not only is it important to produce and encourage recommendations for better water management throughout the West Valley, but there needs to be a proper mechanism to track success or failure of the

proposals. As noted, one of the EVWF's major failures is their lack of a formal evaluation process to analyze their impacts or lack thereof. For the WVWA to be successful beyond being simply a planning organization, they must incorporate a well-thought-out plan to follow through each of their recommended actions. There should be checkpoints throughout all stages of an idea, whether it dies on the drawing board or succeeds all the way to become a local policy. This constant evaluation will ensure only the most promising recommendations continue on and allow for reflection on what will or will not be successful in the West Valley.

### **Recommendation 3: Outdoor Water Use Recommendations**

*Goal: Targeting factors that influence outdoor water usage in the West Valley.*

Considering the above discussion of Goodyear, Avondale, and Peoria's water situation, the need to address outdoor water use is evident. As mentioned, top-down governmental policies and ordinances regarding indoor plumbing and water monitoring were implemented decades ago. It has become so commonplace that it is almost impossible now to buy a showerhead or toilet that is not water efficient. This has yet to occur for outdoor water use. The WVWA could work with the local and state governments, plumbing companies, and manufacturers to push through plumbing code legislation, i.e., something that requires monitors and water-saving fixtures for outdoor use. Just by being able to visualize how much water it takes to keep up a "pretty" lawn and making alternative fixtures readily available to the public could drastically reduce outdoor water use. In the same way that this became commonplace for indoor plumbing, it too could be for outdoor plumbing.

The presence of homeowner associations (HOAs) dominate neighborhoods throughout the West Valley,

especially in new developments. While beneficial in many instances, they can hinder the implementation of important changes at the household level due to strict policies, such as requiring homes to have green grass lawns. An organization such as the WVWA could step in and encourage HOAs to review and revise their policies to not only include, but encourage natural/desert landscaping. Additionally, though more radical, there have been instances, such as in California, of “drought shaming” - making it the norm to have a brown lawn, and therefore whoever does not stand out in a negative way. Working with HOAs will provide an “in” for the WVWA to encourage better water use on a large scale, household level throughout the valley.

## **CONCLUSION**

The West Valley is facing a shortage in future water supplies to meet future demand under expected buildout conditions. With limited access to CAP water and minimal access to SRP or surface water,

water supplies are already constrained within the West Valley. Therefore, the West Valley Water Association was formed in order to address these sub-regional water challenges. Through planning, governance, and research studies, the organization seeks to better understand the problem facing the West Valley and propose actions that can address these problems. In order to take action, though, the organization must first have an exhaustive and relevant strategic plan. We reviewed the General Plans for several cities in the West Valley, and several strategic plans from other multi-county water organizations. From this analysis, we propose three recommendations to be instrumental in the WVWA’s strategic plan: policy recommendations based on conducted research studies; a process to evaluate recommended actions from beginning to end; and targeting plumbing codes and HOAs to manage and reduce outdoor water use. These recommendations are crucial for an organization to successfully work towards achieving sub-regional water security in the West Valley.

## REFERENCES

- City of Goodyear. (2016). *Integrated Water Master Plan*.
- Decision Center for a Desert City. (2017). *Website*. Retrieved 11/18/2017 from <https://sustainability.asu.edu/dcdc/about/>
- East Valley Water Forum. (2007). *East Valley Water Forum Management Plan*. Retrieved 10/10/2017 from <http://evwf.org/wp-content/uploads/2015/01/FINAL-MANAGEMENT-PLAN-JUN071.pdf>.
- East Valley Water Forum. (2011). *Drought Scenarios*. Retrieved 10/10/2017 from <http://evwf.org/wp-content/uploads/2015/01/EVWF-Final-Drought-Model-Report-2011-10-17.pdf>
- Environmental Resources Division, Public Works - Utilities Department. (2017). *City of Peoria Drought Management Plan* (pp. 1-17). Peoria, AZ.
- Haldiman, P. (2014). What's the future of the West Valley's water supply? Retrieved November 19, 2017, from <https://www.azcentral.com/story/news/local/glendale/2014/09/19/glendale-peoria-surprise-looks-future-water-supplies/15894971/>
- Interview with City of Avondale. [Telephone interview]. (2017, October 23).
- Interview with Decision Center for a Desert City. [In-person interview]. (2017, November 10).
- Larson, K. L., A. D. Wiek, & L. Withycombe Keeler. (2013). A comprehensive sustainability appraisal of water governance activities and principles in Phoenix, AZ. *Journal of Environmental Management*. Retrieved 9/16/2017 from <http://www.sciencedirect.com/science/article/pii/S0301479712006019>.
- The Republic. (2015). How big will the West Valley grow? Retrieved November 19, 2017, from <https://www.azcentral.com/story/news/local/glendale/2015/06/15/population-census-glendale-peoria-west-valley-cbt/71248838/>
- United States Census Bureau. (2016). Retrieved November 19, 2017, from <https://www.census.gov/data.html>
- West Valley Water. (n.d.). Retrieved 11/06/2017 from <http://westcaps.org/>
- WESTCAPS. (2016). *West Caps 2017 Strategic Plan Update*.
- WESTCAPS. (2017). *Factsheet: West Valley Water Association*.

## APPENDICES

### I. Scope of Work

#### **Managing Water for Good:** A Strategic Plan for the City of Goodyear Fall 2017

##### **Background**

The City of Goodyear is a member of the new action-based organization called the West Valley Water Association, whose goal is to work regionally and collaboratively to implement plans that ensure water availability for the West Valley and the City of Goodyear well into the future. With a future unmet water demand of 800,000 acre-feet (AF) for the entire West Valley under projected build-out conditions, the City of Goodyear, like the other West Valley cities, will face serious challenges without a strategic plan to address this water shortage

With Arizona State University's School of Sustainability (SOS), the City of Goodyear requests help in creating the West Valley Strategic Plan. This strategic plan will help ensure the success of this region to meet future water demands by focusing on institutions and governance structures that influence future water planning. SOS will produce a report detailing existing documents, policies, and available data regarding water usage, exemplifying at least three case studies of cities comparable to Goodyear, and recommending future actions for the City of Goodyear.

##### **SOS Services**

- Literature review of existing strategic plans and water policies, including the governance structure of the West Valley Water Association and literature published by the Decision Center for a Desert City (DCDC)
- Highlight at least three comparable regional plans similar to the configuration of the West Valley Water Association in order to provide examples of strategic plans for future water demand
- Formulate recommendations for a strategic plan for future water usage

##### **SOS Deliverables**

- Deliver a 15-25 minute presentation at the end of the fall 2017 semester
- An executive summary (2 pages) and an in-depth report
- Future action report

##### **City of Goodyear Commitments and Responsibilities**

- Promptly respond to emails
- Provide relevant documents, plans, and data to assist in literature review
- Facilitate site visit to the City of Goodyear as needed

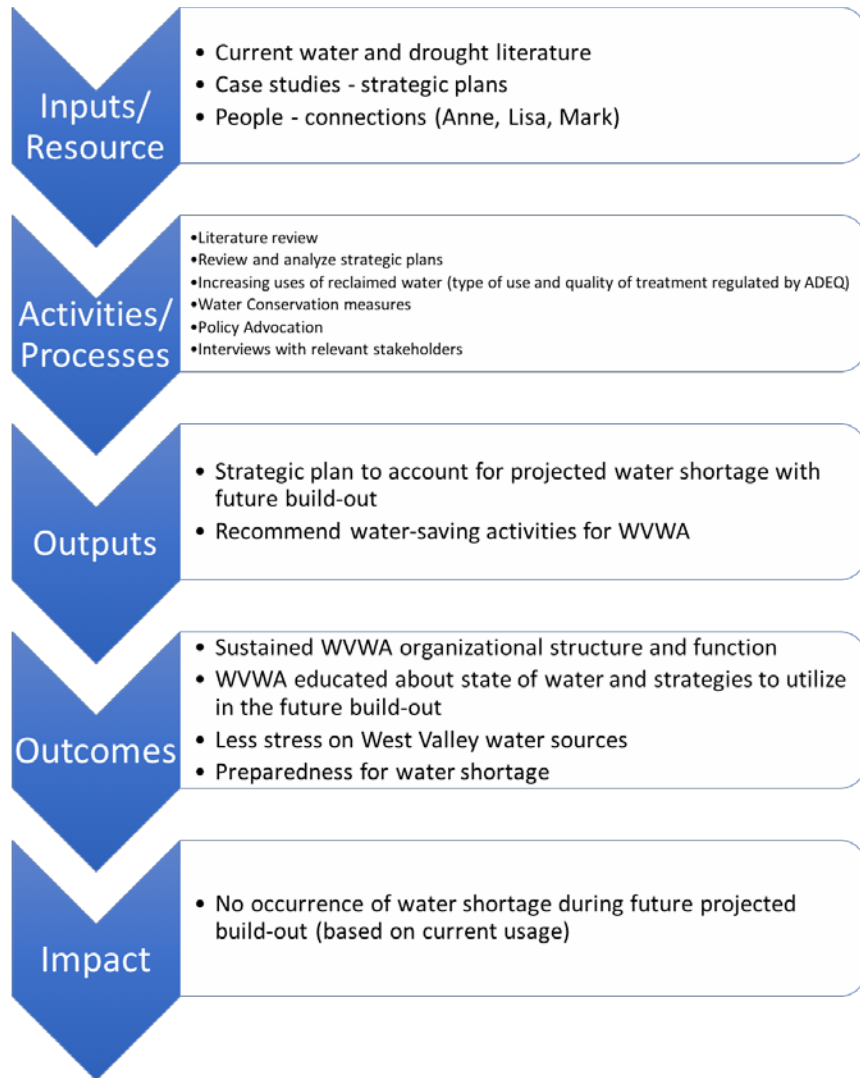
**Timeline of Deliverables**

- Draft presentation and draft report to be submitted on November 9, 2017
  - Responses and suggestions requested from the City of Goodyear by November 22, 2017
- Final presentation and report on November 30, 2017

*Disclaimer: This SOW is for the purpose of the 2017 SOS 594 class only*



## II. Logic Model



### III. Communication Strategy

A general pathway for communication strategies can be described by the following five-step process. This can be modified regardless of the communicator (e.g. the city, a sub-regional organization) or who is receiving the information (e.g. the city council, the general public).

1. *Meetings with local decision-makers:* Talking about research and planning allows for greater discussion and understanding around the research process, making it more likely for the decision makers to support policy recommendations that stem from created reports.
2. *Community engagement:* As the city serves the residents who live there, it is important to engage with the community to understand their perspectives on major issues and their desires for their local community. This can be in the form of town hall meetings, paper or electronic surveys, or informal interviews with residents.
3. *Formal partnerships:* Partnering with other organizations can provide resources, credibility, and salience to the work of an organization or city in order to further advance studies and projects from planning to action.
4. *Informal relationships:* Building social capital is important as information changes hands from the researchers/planners to the decision-makers. Increased social capital provides opportunities for support, promote, and defend the planning and recommendations of the city or organization.
5. *Policy briefs and short reports:* Verbally translating long and/or technical reports into shorter executive summaries, policy briefs, and info graphics will allow those unfamiliar with the subject matter of the report to easily understand the findings and suggestions that come from extensive research and planning in ways that appeal to decision-makers.

Using this communication pathway – in full or only the applicable parts – can allow for better communication and more effective implementation of research, planning, and recommendations. The following describes a more specific way for the WVWA to apply this communication pathway.

The main audience for this specific project is the current and future WVWA board of directors, staff, committees, and officers. As a higher-level audience, the project documents do not need much alteration to successfully communicate the content. An executive summary highlighting the main points will be provided to grab attention and convey major findings. The full report will be available for further examination if someone desires.

These documents should also be made available to the public, preferably both on the WVWA and City websites, so that participating cities can learn about and understand the WVWA's strategic plan for water management. In this case, the executive summary should stray away from being a technical document and instead include eye-catching colors, photographs, easy-to-read bullet points, and activities or actions the public can partake in to help achieve the WVWA's goals. Along these lines, there should be a WVWA presence at relevant community engagement events throughout the West Valley to spread the word and gain more traction. Finally, increasing social capital between the WVWA and the city councils of the West Valley will allow for greater likelihood of implementation of WVWA recommendations and strategies. By using these practices to make sustainable water practices known, WVWA recommendations will hopefully become more likely to be implemented by decision-makers.