Comprehensive Water Conservation Plan
Las Virgenes Municipal Water District
Fiscal Years 2018-20

1. Background

On April 7, 2017, Governor Brown announced that California's most recent and severe drought had ended. This determination was based largely upon the historic precipitation that much of the state experienced during the 2016-2017 water year. While the precipitation was a welcome relief to much of the state and greatly improved water storage conditions, much of southern California remained in moderate to severe drought.

Unfortunately, just a year after the end of the most recent drought, California is experiencing another dry water year. The dramatic spatial and temporal variability of precipitation in California underscores the need to make conservation a continuous effort at both state and local levels of government. Based on this understanding, the Water Resources Control Board has implemented and is currently developing water use regulations intended to promote the efficient use of water in the state. Central to state conservation efforts are two important regulatory frameworks: "20 by 2020" and "Making Conservation a California Way of Life." Both of these frameworks will require local water agencies to achieve conservation objectives and comply with new regulations aimed at preventing wasteful water use.

Fortunately, the District was able to achieve significant water conservation during the last drought, which illustrates that customers in our service area are able to achieve, or exceed, conservation levels that will be required by the state. This understanding will be particularly important to meeting water conservation mandates and minimizing the amount of "drought rebound" that is observed after a drought ends, when water use typically increases. To assure compliance with state mandates and to make sure that conservation stays a local way of life will require a combination of strong outreach and education, as well as making investments in innovative conservation programs to assure that conservation continues to be a local way of life. These programs are outlined in this Comprehensive Water Conservation Plan (CWCP).

2. Conservation Plan

The Las Virgenes Municipal Water District (District) implements numerous conservation initiatives each year and consistently provides outreach to educate customers on the importance of conserving water and remind them of the importance of using this limited resource wisely. In general, customers have done a good job conserving water as illustrated by decreasing per capita water use over the last few decades concurrent with significant increases

in population. Additionally, the District was able to report water savings of 34 percent in response to the most recent drought when compared to water usage in 2013. However, it will require continued diligence to maintain the level of conservation needed for future regulatory compliance and to assure that customers have the tools and understanding to remain within their water budgets.

In anticipation of decreasing water availability, potential for additional state mandates to reduce water consumption and to better gage customer use of water, the District implemented budget-based water rates in 2016. These rates were specifically structured to allow customers enough water to efficiently irrigate their landscapes based upon the amount of irrigated area on properties and daily evapotranspiration rates. The implementation of this rate structure allows the District to better understand water use between customers and target specific conservation strategies for different customer water use patterns.

Most of the excess water use that occurs in the District is the result of over irrigation. Estimates of water use in the District indicate that approximately 70 percent of potable water use is for outdoor irrigation. Outdoor water use is also the principle cause for rebounds in water use after periods of drought when people start to irrigate landscaping again at pre-drought levels. Of particular concern are customers who consistently use greater than 200 percent of their water budgets and pay excess use rates and administrative penalties. The District provides potable water service to 18,648 single family accounts. Of these accounts, 7,605 have used over 200 percent of their budget at least once in the last 24 months. The amount of water used in this penalty tier is significant, totaling 613,226 units (1,407 acre-feet) of water.

Based on water usage and number of penalties assessed on a monthly bases, it appears that penalties increase into the fall and winter months. This pattern in penalty assessments is most likely related to maintaining summer irrigation rates into the months when evapotranspiration rates drop significantly thus reducing the budget available for irrigation. Currently, the District does not have a conservation program that directly addresses this issue other than posting reminders on social media platforms, print advertisements and the District's website to have customers adjust their irrigation controllers.

2.1 Weather Based Irrigation Controller Giveaway and Installation Program

Figure 1 - WBICs can be programmed and monitored with a Smart Phone

Weather based irrigation controllers (WBICs) are connected to the Internet via Wi-Fi and are able to automatically adjust irrigation during periods of precipitation, as well as varying local evapotranspiration values as they change seasonally. As a result, these controllers take the guesswork out of adjusting irrigation to weather variation and seasonal changes in customer water budgets. Based upon results of similar programs in other water districts and cities, significant water savings can be achieved by providing these controllers to customers free of charge. Similar to these programs, the District will collaborate with a controller manufacturer that has successfully implemented full service "Turn Key" giveaway and installation programs that include comprehensive marketing and outreach services, screening of eligible participants, scheduling of professional installation services, complete full installation, and performance verification for installed controllers. This type of partnership greatly reduces the amount of District staff time required to implement such a program and allows customers to take full advantage of trouble shooting and customer support services provided by the manufacturer.

The program will install one thousand controllers per year for two years. Priority will be given to customers who have paid penalties over the last two years for exceeding 200 percent of their water budget. 1,600 controllers (80 percent) of controllers will be dedicated for penalty users. 400 controllers (20 percent) will be made available to all other customers on a first-come, first-serve basis. Additionally, any left over WBICs at the end of the two year period not installed for penalty users will be offered to any customer on a first-come, first-serve basis.

<u>Program Specific Goals</u>

- Reduce water waste resulting from over irrigation
- Reduce the number of penalty paying customers
- Improve customer engagement and satisfaction
- Maximize the numbers of controllers installed and correctly programmed
- Minimize District administrative effort

Program Cost

The program will install one thousand controllers per year between July 1, 2018, and June 30, 2020, for a total of two thousand controllers. The program will be implemented over the next two year FY 2018-20 budget cycle for a total cost not to exceed $1,002,774 including in-house staff time with existing resources already provided for in the operations budget. The program will be funded primarily with the use of penalty money collected from wasteful water use. At an estimated cost of $417 per controller and with 2,000 controllers installed at a total estimated program cost of $834,000 (not including staff time), the equivalent cost for each acre-foot of water that is saved is estimated at $758. Therefore, the cost for this Program is very competitive with the cost for importing and delivering State water, which is more than $1,000 per acre-foot.

Potential Water Savings

Implementation of this WBIC Program alone over a two year period is estimated to reduce water consumption by between 31 and 78 acre-feet District-wide on an annual basis (up to 1, 560 acre-feet over a 20-year period). The average controller is estimated to reduce irrigation by between 5,000 and 13,000 gallons per year per single family household.

2.2 High Water Use Account Review and One-on-One Customer Consultations

Each month, accounts using the most water and furthest over budget will be reviewed to determine accuracy of their irrigated areas and historical water use. Since the accuracy of irrigated areas is a fundamental element of determining water budgets, it is important to make sure that an inaccurate irrigated area is corrected and not affecting customers' water budgets. Similarly, review of historical water use could help determine if water use patterns have changed as a result of potential leaks or other factors such as filling a pool. Based upon this review, accounts with accurate budgets and historically high water use will be selected for personal contact and one-on-one consultations.

The District currently provides water audits for customers who have high bill complaints to help them reduce their water use. This service will be expanded to include proactive contact with our highest water users and those using the greatest volume of water in excess out of their budget. By meeting with the property owners on-site, District staff will be able discuss water use with the customer to better determine how and where water is being used on the property and how water use can be reduced. This will allow District staff the opportunity to determine if the property potentially has a leak and assist the property owner in determining where the leak is occurring. Discussions will also include proper irrigation scheduling and maintenance and could include an irrigation audit if deemed useful. Indoor water use will also be discussed so that the property owner can better understand how to stay within their total water budget.

Figure 2 - One way to ensure efficient water use is to maintain and adjust sprinklers on a regular basis

Program Specific Goals

- Provide a detailed review of at least 200 accounts per year
- Provide at least 60 comprehensive one-on-one consultations with property owners per year (up to 150 depending on available staffing resources)

Program Cost

This program will be completed with existing staff and budgeted resources and will not require additional funding to complete.

Potential Water Savings

Some of the program elements such as determining the accuracy of irrigated areas are administrative corrections to budgets that would not result in water savings. The one-on-one consultations could result in significant water savings based upon the issues identified and corrected by property owners. Up front estimation of water savings are difficult to determine with reasonable accuracy. However, water use before and after consultations could be performed to provide more accurate estimations of water saving resulting from this program in future years.

2.3 Rain Barrel Giveaway Program

In the fall of 2016, the District gave away over 350 rain barrels as part of the first rain barrel giveaway program. Building on the success of this program, up to 500 rain barrels will be provided to customers free of charge. Each interested customer will be eligible for up to two rain barrels per property. Rainwater captured by these barrels can be used to augment winter irrigation and help to remind customers of the importance of efficient water use on their landscaping while taking advantage of a free source of water. The program will be partnered with the Landscaping Initiative outlined below to illustrate how the use of native plants and climate appropriate landscaping can greatly reduce the amount of irrigation needed for an attractive garden. Depending on the size of the garden and amount of rainfall in a year, a well-established native landscape could require little to no potable water by relying on natural rainfall and water collected in rain barrels. Another component of this program will consist of notifying customers that have received rain barrels in the past and not using them that the rain barrels will be picked up at no charge so that they can be utilized by another customer.

Figure 3 - More attractive rain barrels will be provided as part of this program

Program Specific Goals

- Provide up to 500 rain barrels per year to customers free of charge over a two year period
- Remind customers of the need to conserve water outdoors, especially in the winter months
- Encourage the use of native plants and climate appropriate landscaping
- Provide attractive rain barrels that complement local residences and landscaping

Program Cost

The program is budgeted for $50,000 per year for two years ($100,000 for 2 years) plus in-house staff time with existing resources that is provided in the proposed FY18-2020 operations budget. Between the WBIC and Rain Barrel Programs, approximately $88,000 in incentive funding will be available from the Metropolitan Water District of Southern California. Costs incurred by the District will be funded primarily with the use of penalty money collected from wasteful water use.

Potential Water Savings

Each rain barrel can typically hold about fifty gallons of rainwater and depending upon the surface of the roof can usually fill up even during relatively small rain events. Conservatively assuming six rain events large enough to fill the barrels each year and complete use of the water between events, the program will save approximately 300,000 gallons of water per year or just under one acre-foot of water per year. While the dollar amount invested will yield a relatively low water savings, the purpose of the program is aimed at raising awareness for efficient water use that will in turn contribute to the overall water savings from implementing the entire CWCP.

2.4 Development of Landscape Conversion Initiative

It has been estimated that up to 70 percent of potable water use in the District is used for outdoor irrigation. As a result, the greatest opportunity to conserve water is to educate customers about efficient outdoor water use and encourage the transition from high water demand landscaping to more efficient landscaping practices. Traditionally, this has been done by linking reduced water use to saving money. While this message is appealing to some, it has a limited audience and does not motivate all customers. Also affecting the decision to modify landscaping is people's fear of change, lack of inspiration, fear of what it might look like, cost of conversion and concern about their ability to convert their landscaping.

Addressing the concerns that customers have in addition to the cost of outdoor water use could significantly broaden the appeal of conservation programs. Capitalizing on the Districts location in the Santa Monica Mountains and the beauty of the local environment have a direct connection to native and climate appropriate landscapes that integrate with and compliment the local ecology. Making a connection to the ecosystem services that native landscapes provide could broaden the appeal of native gardens and inspire customers to convert to landscaping that provides food and habitat for local wildlife. Since native gardens provide these resources, they will attract beneficial wildlife like birds and beneficial insects that provide natural pest control in native gardens. Additionally, native plants do not require fertilizers or pesticides, which reduces the need to use harmful chemicals that impact local watershed.

Innovative programs that address people's uncertainties about how to convert their landscaping and the associated costs could also broaden the appeal of converting to native landscaping. For example, Resources Central in Boulder Colorado has a program called "Garden in a Box" that packages native plants into predesigned garden types that attract specific types of wildlife like humming birds, butterflies and honey bees. The garden kit includes planting designs for 100 square foot plantings, includes all of the needed plants and time series graphics of what the garden will look like at planting and yearly time steps until the garden is mature.

This allows the customer to select the garden type they want without having to design the garden, select the plants or worry about what the garden might look like after conversion. Customers can also purchase the garden kits over a period of time to convert their landscaping over several years rather than all at once. Each spring a selection of garden types is made available for purchase and they routinely sell out each spring. The website for this concept is: https://resourcecentral.org/gardens/

Education and outreach will continue to be an important tool to assist property owners in understanding the benefit and feasibility of native landscaping. By providing the opportunity for residents to see native and climate appropriate landscaping in person, demonstration gardens can be extremely valuable educational tools. They allow residents to see firsthand how attractive and functional well designed native landscaping can be while also serving as outdoor class rooms that educate people on the benefits and water savings that can be achieved. As a result, one of the goals of this effort is to develop different types of demonstration gardens that can be located at commercial properties, schools or District facilities. One of these demonstration gardens is proposed to be incorporated with the Pure Water Demonstration Project at District Headquarters Facility Building No. 1.

Figure 4 - Example of Garden in a Box, Butterfly Bounty Option ($154 for 100 square-feet)

Over the following year, a more detailed initiative will be developed to incorporate the ideas and examples discussed above for broader implantation over the following years. Efforts of this type will require the identification and development of specific incentives for landscape conversion including the development of broad partnerships, which will take some time.

Program Specific Goals

- Develop a garden initiative in 2018 to be launched in early 2019
- Broaden the appeal of native plants and climate appropriate landscaping utilizing social media, the District's website, and gardening classes
- Develop two demonstration gardens by June 30, 2020

Program Cost

This program will be completed with existing staff and resources, funds already in the CIP, and other funding sources such as grants and donations that are being sought out.

Potential Water Saving

Water savings from the development and implementation of this Program in conjunction with the other initiatives in this CWCP can be substantial but difficult to quantify at a program specific level.

2.5 Improved Education and Outreach Efforts

Central to successful implementation of these programs will be an effort to update and improve our education and outreach efforts to reflect the goals of these programs and our improved understanding of water use. The implementation of budget based rates has greatly improved our ability to better understand water use behavior and more specifically target our efforts to address water use issues. For example, knowing that water use penalties increase in the late fall and early winter allows us to specifically target education and outreach efforts to customers during this period to let them know that they need to adjust their summer-time irrigation schedules in order to stay in budget. Also, by broadening our outreach messaging to include a broader set of topics other than saving money could potentially resonate with a larger population of customers.

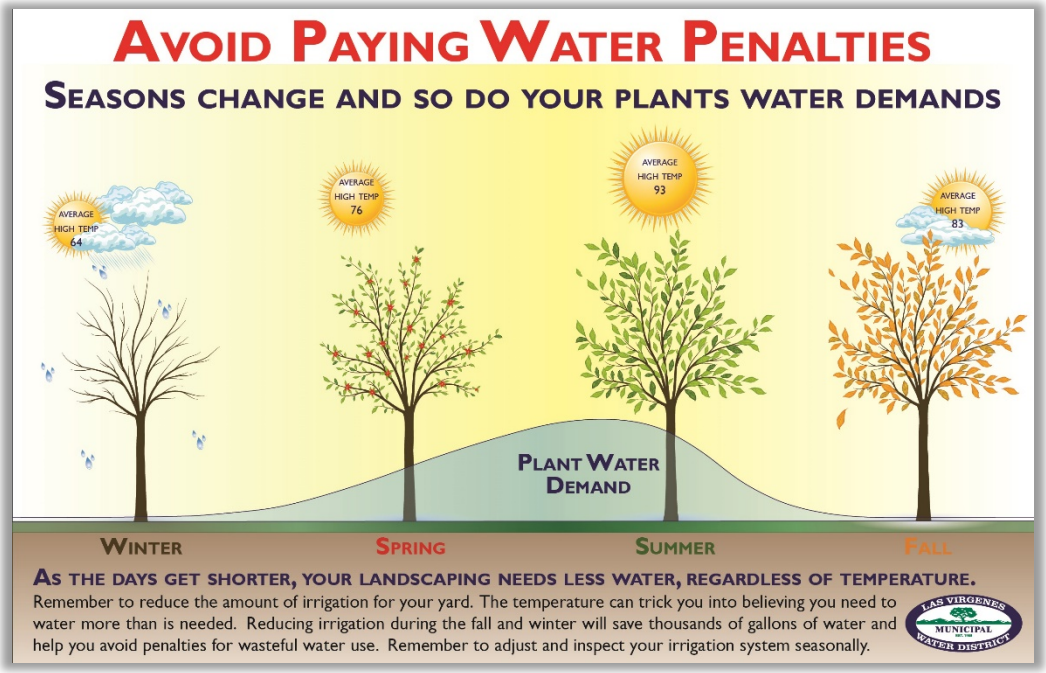

Figure 5- This post card was mailed out to customers in 2017 to help educate them on irrigation practices throughout the year

Program Specific Goals

- Improve customer understating of evapotranspiration and how it affects their budgets
- Include a broader range of outreach topics to appeal to a broader audience
- Develop outreach material for one-on-one consultations
- Develop and distribute a welcome package for new customers
- Develop an advertising campaign that identifies seasonal water use concerns to be targeted

Program Cost

This program will be completed primarily with existing staff and resources and will not require additional funding to complete.

Potential Water Saving

Water savings from the development and implementation of this Program in conjunction with the other initiatives in this Conservation Plan can be substantial but difficult to quantify at a program specific level.

3.0 Two-Year Comprehensive Conservation Plan Targets

This CWCP will be implemented over the period beginning July 1, 2018 through June 30, 2020. Adjustments to the Plan may be made as improvements are identified. The overarching targets for this Conservation Plan, to be calculated twelve months after full implementation, on or after June 30, 2021 are as follows:

- Reduce water use in the inefficient and excessive tiers (which includes all water use for single family households above 100 percent of water budgets) by 25 percent based on a 12-month rolling average when compared to the baseline annual average between April 2016 and March 2018.
- Reduce water use that is 200 percent above water budgets by at least 50 percent based on a 12-month rolling average when compared to the baseline annual average between April 2016 and March 2018.

The corresponding reductions or water savings is 421 acre-feet per year (a reduction of 69 acre-feet in the inefficient and excessive tiers and 352 acre-feet per year in the penalty tier). These reductions are anticipated to result in 8,420 acre-feet of water savings over a 20 year period. Based on the capital investments for the WBIC, Rain Barrel, and the other initiatives as described, and accounting for $88,000 in incentive funding from Metropolitan Water District, the dollar per acre-foot of water saved is estimated at $100 when not accounting for internal staff time that is already included in the annual operating budget.

It should be noted that this does not include the cost for the demonstration gardens as described. While one of the demonstration gardens would essentially be “free” through grants and donations, the demonstration garden that is being incorporated into the Pure Water Demonstration Project at District Headquarters Building No. 1 is estimated between $200,000 and $300,000 once completed. Including the higher estimated cost for the Pure Water Demonstration Garden increases the dollar per acre-foot of water saved to approximately $136. Given that imported State Water and all other available or potential water sources (i.e. the Pure Water Project) are expected to cost at least $1,000 per acre-foot, these programs are highly feasible.

Figure 6- Potential Demonstration Garden Area at Headquarters Bldg. #1 (outlined in red)

Implementation of the CWCP over the course of the next two years will help ensure that the District meets its obligation under current law to reduce total water use by 20 percent by the year 2020 as well as meeting water-efficiency regulations that are anticipated in future years. The implementation of other Projects such as AMR/AMI (Automatic Meter Reading/Advanced Metering Infrastructure) will supplement this effort as well.