Water Use Efficiency Dashboard WaterSMART Application

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1 Technical Proposal

1.1 Executive Summary

Date: October 17, 2023

Applicant Name: Three Valleys Municipal Water District

Applicant City, County, State: Claremont, Los Angeles County, California

Project Title: Three Valleys Municipal Water District Water Use Efficiency Dashboard

Project Summary: Three Valleys Municipal Water District (TVMWD) is a wholesale water agency that serves over 500,000 people in a 133-square-mile area in eastern Los Angeles County via 13 member agencies. Due to ongoing and anticipated drought cycles in California, TVMWD is pursuing the WaterSMART—Applied Science Grants for Fiscal Year 2023 Funding Opportunity to implement its Water Use Efficiency Dashboard. The proposed project involves the development of a dashboard that will provide water managers at its member agencies with information that can be used to effectively allocate and manage water use within their service areas. The proposed project includes creation of the dashboard, as well as training for TVMWD member agencies on how to use the dashboard to improve water resource planning efforts.

Length of Time and Estimated Completion Date: The proposed project will occur over the course of approximately 18 months and will be completed by September 2025.

Relationship to Federal Facility: The proposed project is not located on a Federal facility.

1.2 Background Data

TVMWD is a wholesale water agency that serves over 500,000 people in a 133-square-mile area in eastern Los Angeles County via 13 member agencies. TVMWD's member agencies retail water directly to their customers or wholesale it to other water systems for resale. TVMWD's member agencies produce water from local sources; however, when water demands exceed these local supplies, the member agencies may rely on TVMWD to supply their additional water needs. TVMWD'S 13 member agencies include the Boy Scouts of America, California State Polytechnic University at Pomona, City of Covina, City of Glendora, City of La Verne, City of Pomona, Golden State Water Company (Claremont and San Dimas systems), Mount San Antonio College, Rowland Water District, Suburban Water Systems, Valencia Heights Water Company, and Walnut Valley Water District. TVMWD's service area includes the cities of Claremont, Covina, Diamond Bar, Glendora, Industry, La Verne, Pomona, San Dimas, Walnut, and West Covina as well as unincorporated areas of Los Angeles County (including Charter Oak and Rowland Heights).

TVMWD is one of 26 member agencies of The Metropolitan Water District of Southern California (Metropolitan). TVMWD's water supply sources consist of untreated imported water purchased from Metropolitan, treated imported water purchased from Metropolitan, and groundwater from the Six Basins Groundwater Basin. Imported water from Metropolitan

accounts for the majority of TVMWD's supply. Water purchased from Metropolitan comes from the Colorado River Aqueduct and the State Water Project (SWP). Of the 13 member agencies, only 3 currently utilize recycled water, and only 5 currently utilize surface water supplies. The remainder use a combination of imported water and groundwater. Several of these agencies are in SWP-dependent areas, meaning they cannot receive Colorado River supplies from Metropolitan and are solely dependent on imported water from the SWP.

In 2022, the wholesale demand from TVMWD was approximately 53,200 acre-feet. Over the past 10 years, TVMWD's total water demands have ranged from 57,472 acre-feet per year (AFY) to 76,723 AFY, with an average of 67,327 AFY. Retail water usage includes residential, commercial, industrial, agricultural, and institutional/governmental users. Among those users, residential accounts for approximately 70 percent of total demand.

1.3 Technical Project Description

Applicant Category

Category A – TVMWD is a wholesale water agency located in California.

Detailed Project Description

TVMWD has prepared this application to develop a Water Use Efficiency Dashboard that will provide water managers at its member agencies with information to effectively allocate and manage water use within their respective service areas. The proposed project will consist of creation of a tool kit for TVMWD member agencies, which will focus on demand management, customer engagement, and compliance with the 2018 legislation on water use that requires making "water conservation a California way of life." The tool kit will enable the water managers to:

- **Identify inefficient water users who would benefit from water use efficiency rebate programs and outreach.** Reports can be generated that show users over an estimated budget (budget based rates and WUO indoor and outdoor estimates), over or under a percentage compared to last month's billing period and same month last year, top users. At the individual customer level, staff will see usage over various date ranges, their WUO estimates and if they are in their budget, and the rebates/programs they (or previous customers at that location). All the rebate/program data will be aggregated and potentially normalized for weather to show the impact of all the programs and individual ones.
- **Improve water resource demand forecasts.** Reports can be generated that show forecasts compared to total usage over a given date range. Staff can see customers on a map and create specific groups with usage information. This may help identify areas for demand forecasting. The ability to see low usage can help identify failing/failed meters which can recoup lost revenue but also adjust future demands.
- **Provide measurements of irrigable/irrigated areas for water audits.** Data is displayed for each customer with the formula and data source visible. A report can be run to focus on customers with high usage compared to square footage.

- **Create parcel-level water use allocation based on geographic location and climate conditions.** Estimated budgets for indoor/outdoor use are created for each customer.
- **Comply with regulations on agency-wide water budgets as required by California Senate Bill 606 and Assembly Bill 1668.** The agency can see their overall WUO target and if they are meeting that target with some recommendations for focusing efforts on customers that could save water to help the agency into compliance.
- **Respond to customer billing inquiries.** The new platform provides both high level and individual customer data in an easy to see dashboard with pertinent information to help a customer understand their use and ways to save.

To create this tool, TVMWD will utilize aerial mapping data completed by other regional entities, such as the Los Angeles County Department of Public Works and Metropolitan, to obtain high-resolution data that provides parcel-level information on non-functional turf currently not available to the extent that is proposed by this project. The currently-available data was produced at a regional level and is not discrete enough to provide parcel-level information that will enable water managers in retail agencies to efficiently manage water use and develop targeted programs for outreach or rebates/incentives. As a result, the proposed project will utilize the aerial mapping data obtained by Metropolitan to develop parcel-level data for each of the 13 TVMWD member agencies to provide information on current water use, total irrigable area, non-functional turf, and the associated water budget per parcel. The tool will also provide parcel-level information on participation in previous rebate programs.

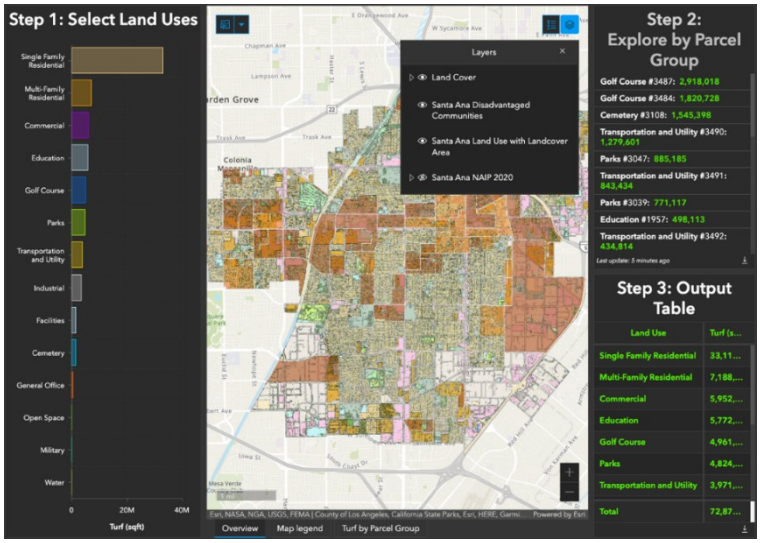


Figure 1 Example Dashboard

Development of the proposed project will include the following tasks and activities.

Task 1 Develop a Detailed Work Plan

- Task 1.1: Coordination with Reclamation to execute an agreement to develop the Water Use Efficiency Dashboard.
- Task 1.2: Draft and release Requests for Proposal to solicit aerial mapping imagery and a technical consultant to prepare the Water Use Efficiency Dashboard.
- Task 1.3: Prepare a detailed work plan for review and approval by Reclamation.

Task 2 Develop the Water Use Efficiency Dashboard

Once the executed agreements with Reclamation and a technical consultant have been established, TVMWD will initiate the activities necessary to establish develop the Water Use Efficiency Dashboard.

- Task 2.1: Obtain necessary data from Metropolitan.
- Task 2.2: Perform Land Cover Analysis
  - Purchase, download and manually inspect 2022 NAIP (National Agricultural Imagery Program) imagery to ensure the there is no more than 2 pixel (1.2 meters) offset from the GIS land use data and align any imagery outside of the tolerance.
  - Perform imagery classification of 2022 imagery using the California Irrigated Landscape Algorithm (CILA); landcover classes include 'Turf', 'Bushes/Trees' and 'Impervious/Misc'.
  - Spatially join the land use areas and landcover classes
- Task 2.3: Create Customized Non-Functional Turf Dashboards
  - Create WebMaps and dashboards for TVMWD and each member agency. The dashboards will include functionalities such as: Calculate NFT by Agency, Filter by Rebate Status, Search Map by APN, and Export Land Cover by Land Use.

Task 3 Provide Training on Use of the Water Use Efficiency Dashboard

- Task 3.1: Facilitate 2 trainings with member agencies on use of the dashboard.
- Task 3.2: Prepare user guide with key guidance on effective use of the dashboard.

Task 4 Management Agreement with Reclamation and Project Management

- Task 4.1: Prepare/submit progress reports and reimbursement requests to Reclamation.
- Task 4.2: Water Use Efficiency Dashboard project management.

Goals

The goals of the proposed project include the following:

- Facilitate more effective water planning efforts through the provision of parcel-level water use data on irrigable and non-irrigable areas, non-functional turf, water budget, and water use to TVMWD member agencies to use in water planning efforts.
- Identify inefficient water users and disadvantaged communities who will benefit from water use efficiency rebate programs, rebates, and outreach materials.
- Improve management of water use efficiency within TVMWD's service area.

1.4 Project Location

The geographic area of focus for the proposed project is the approximately 133-square-mile TVMWD service area in eastern Los Angeles County, California. The TVMWD service area includes the cities of Claremont, Covina, Diamond Bar, Glendora, Industry, La Verne, Pomona, San Dimas, Walnut, and West Covina, as well as unincorporated areas of Los Angeles County (including the communities of Charter Oak and Rowland Heights). Attachment 1 presents a map of the TVMWD service area.

2 Data Management Practices

Spatial data and tools developed as part of the proposed project will be developed in an industry standard format that is compatible with Geographic Information System (GIS) platforms. Specifically, the proposed project involves development of a dashboard/tool using ArcGIS Online. All data and derivative dashboards and experiences will be password protected with each agency having an account that only provides information for their agency. TVMWD will have access to a dashboard with all data, as well as access to each derivative member dashboard.

3 Evaluation Criteria

E.1.1. Evaluation Criterion A – Water Management Challenges

Water Management Challenges

Figure 2 Low Water Levels at Lake Mead (photo courtesy of NOAA)

The state of California has experienced recurring drought cycles over the last century with notable recent droughts including 1976-1977, 1987-1992, 2007-2009, and 2012-2016 as well as the current drought that started in 2020. During 8 of the last 10 years, over 80 percent of the state has experienced drought conditions varying from abnormally dry to exceptional drought, and in 2021, over 40 percent of the state was classified as experiencing exceptional drought conditions.[1] That same year, the initial State Water Project (SWP) allocation was set at 0 percent of requested supplies, which was ultimately increased to just 5 percent for the final allocation, creating supply challenges for many southern California water agencies.[2] Despite the recent series of storms in California, as of October 9, 2023, certain provisions of a statewide drought emergency declaration, in which the Governor urges Californians to advance their water conservation efforts, remain in effect. In addition, in December 2022, the State Water Resources Control Board (SWRCB) issued water conservation emergency regulations that require urban water suppliers to implement, at a minimum, all local Level 2 demand reduction actions included in their Water Shortage Contingency Plans through at least June 2023.[3] As defined by the California Department of Water Resources (DWR), Level 2

[1] https://www.drought.gov/states/california#historical-conditions

[2] https://water.ca.gov/News/News-Releases/2022/Dec-22/DWR-Announces-Initial-State-Water-Project-Allocation-of-5-percent

[3] https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/regs/emergency_regulation.html.

indicates up to a 20 percent gap between available supply and demand. The California Governor's Water Supply Strategy also includes a goal of reducing demand through conservation to adapt to a new climate reality.[4]

TVMWD is a member agency of Metropolitan and receives approximately 96 percent of its water supplies from Metropolitan.[5] Approximately 30 percent of Metropolitan's water is imported from the State Water Project (SWP), and approximately 25 percent is sourced from the Colorado River Aqueduct.[6] As of February 22, 2023, Metropolitan's SWP allocation was 35 percent of requested supplies, and SWP allocations for the past 2 years were set at only 5 percent of requested supplies.[7] Furthermore, the Colorado River is facing significant challenges due to drastically reduced water supplies that fall far short of the historic allocations to the 7 states that rely on the river. The Colorado River Basin is facing a 23-year ongoing historic drought and low runoff conditions, and Reclamation has imposed a second year of additional shortage declarations to address critically low water levels in 2 of the river's main reservoirs, Lake Powell and Lake Mead (see **Figure 2**).[8] These conditions make allocations of SWP and Colorado River water during periods of drought less reliable than ever before. In addition, climate change models project longer and more frequent and severe droughts, increasing uncertainty in imported water supplies.

Average water supply from the SWP to the TVMWD service area is 17,000 AFY; during the emergency water conditions of 2022, allocation for human health and safety supplies for the 7-month period was established at 8,909 acre-feet (AF). For 2023, the initial allocation of SWP supplies before conditions improved on the SWP system was established at 11,038 AF. The use of SWP supplies during these emergency conditions was restricted for human health and safety. Several TVMWD member agencies that depend solely on SWP supplies (SWP-dependent areas) will be further constrained by the increasingly uncertain future of imported water supplies due to climate and environmental factors, impacts of changing climate on local surface water supplies, and the challenges of managing groundwater quality that requires blending with imported supplies. TVMWD's reliance on imported water for SWP-dependent areas, along with Metropolitan's analysis in its 2020 Integrated Resource Plan demonstrating vulnerabilities in these areas to change in supply or demand, create an immediate need to enhance water supply reliability and conserve water. In 2022, TVMWD activated Level 5 of its Water Shortage Contingency Plan for these areas, requiring a 50 percent reduction in water use while being challenged to meet demands due to extreme drought (see **Figure 3**). In addition, the TVMWD service area was planning to enter deeper levels of water shortage contingency levels before the SWP conditions improved significantly with the series of 9 atmospheric rivers between December 2022 and January 2023.

[4] https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Water-Resilience/CA-Water-Supply-Strategy.pdf.

[5] https://www.threevalleys.com/uploads/files/WaterResourcesConservation/FINAL%20TVMWD%202020%20UWMP.pdf.

[6] https://www.mwdh2o.com/your-water/how-we-get-our-water/.

[7] https://water.ca.gov/programs/state-water-project/management/swp-water-contractors.

[8] https://www.doi.gov/pressreleases/interior-department-announces-actions-protect-colorado-river-system-sets-2023.

Figure 3 Level 5 Emergency Conservation Notice for Cities of Claremont and La Verne

Since 2000, overall average water use in the TVMWD service area has been 125,000 AF; in the past 5 years, the average water use has been 107,000 AF. The service area is comprised of approximately 84 percent residential and 16 percent commercial users. Residential use accounts for 90,000 AF, 40 to 60 percent of which is used for outdoor irrigation (45,000 AF on average), based on standard industry assumptions and prior experience of TVMWD staff. The most powerful tool for water managers is a better understanding of how this water is used in outdoor applications, such as irrigation of climate-appropriate plantings versus non-functional turf, to better educate end users, develop target water budgets, and create long-term principles and ethics of conscious and responsible water use for today's needs and for future generations.

Furthermore, 35 to 45 percent of the water supply portfolio in the TVMWD service area comes from groundwater extracted from 3 groundwater basins, which are each adjudicated and managed by a watermaster. Water levels in 2 of these basins are influenced significantly by hydrologic patterns, storm flows and groundwater production. For several TVMWD member agencies, the ability to rely on local groundwater supplies has been adversely affected because ongoing climate change and drought conditions due to declining groundwater levels that have resulted from increased production coupled with below-average local runoff in one basin for the last decade and low to no stormwater recharge in 7 of the last 11 years. These conditions have led one Watermaster to further reduce the operating safe yield of their basin by 20,000 AF for years 2023 through 2027 as compared to 2022 and another Watermaster to reduce the amount of available groundwater rights for their basin by approximately one third.[9]

Concerns and Outcomes of Water Management Challenges

TVMWD has an urgent need to address the water management challenge of recurring drought in its service area. If drought is not addressed, it is likely that imported water costs for TVMWD will increase substantially and indefinitely in order to finance necessary investments by Metropolitan toward water supply and reliability efforts. In addition, TVMWD's SWP-dependent areas will be further constrained by the increasingly uncertain future of imported water supplies due to climate and environmental factors, impacts of changing climate on local surface water supplies, and the challenges of managing groundwater quality that requires blending with imported supplies. Should the initial 5 percent SWP allocation announced December 1, 2022 by the California Department of Water Resources have persisted, there would have been insufficient SWP supplies to fully meet consumptive demands not deemed essential to human health and safety needs in the SWP-dependent areas. In the event that sufficient imported water supplies were not available, many TVMWD member agencies would have to rely on

[9] Main San Gabriel Basin Watermaster Report on Preliminary Determination of Operating Safe Yield for 2023-24 through 2027-28 (2023), Six Basins Watermaster Annual Report CY 2022, TVMWD 2020 Urban Water Management Plan

groundwater sources. However, the water quality of local groundwater basins in some portions of the service area currently exceeds the Maximum Contaminant Levels for numerous constituents, including 1,2,3-trichloropropane, hexavalent chromium, arsenic, nitrate, 1,2-dibromo-3-chloropropane, perchlorate, tetrachloroethene, trichloroethene, total dissolved solids, and uranium, all of which require wellhead treatment and blending with imported water to achieve compliance with drinking water standards, which is not cost-effective or feasible in all circumstances. Concerns of overdraft and land subsidence in some of the service area also limit member agencies' ability to rely on groundwater as a reliable water supply.

Ongoing and anticipated drought cycles will also make aquatic habitats, native plants, and native wildlife more vulnerable by introducing additional challenges to maintaining suitable habitat. A lack of adequate water resources could adversely affect the long-term sustainability of aquatic habitats and native plants/wildlife and could potentially benefit drought-tolerant invasive species, disrupting native ecosystems. Extended drought will also lead to increased risk of wildfire as drought creates dry vegetation susceptible to ignition.

Economic outcomes of drought could include job losses and disruption of commercial and industrial processes that require water for operation, such as retail food establishments, bars, salons, laundromat, and car washes. On average, commercial and industrial use within the SWP-dependent areas account for nearly 16 percent of total demand. Water for commercial use is even higher for some other member agencies, such as Rowland Water District, where commercial demand accounts for over 40 percent of the total demand. If recurring drought conditions are not adequately addressed, economic losses in the commercial and industrial sectors due to the lack of available water supplies could occur.

Project Relationship to Water Management Challenges

TVMWD is taking a comprehensive approach to water management that aligns state, regional and local planning efforts to ensure reliable supply availability with responsible use of water. The purpose of the proposed project is to provide water managers at TVMWD's member agencies with information to effectively allocate and manage water use within their respective service areas. The project will enable water managers to obtain parcel-level information on existing water use, participation in previous rebate programs, total irrigable area, non-functional turf area, and water budget. Information at this scale is essential for water management in the TVMWD service area, specifically with regard to water supply reliability, drought management activities, water conservation and efficiency, and protection of endangered species habitat. There is an urgent need to conserve water within the TVMWD service area to respond to pending legislation and regulations for a "conservation way of life" as well as the ongoing water supply shortage and to position the region for future conservation in preparation for droughts resulting from climate change. By providing water use data at a granular scale, the project will enable TVMWD water managers to:

- **Create aerial imagery with high resolution** for the TVMWD service area that provides detailed parcel-level information including meter location, irrigable area, parcel category type, and areas of turf and non-functional turf.

- **Identify water use by parcel and by use category** by associating water use information maintained by retail water agencies' billing databases with parcel-level information along with water use efficiency program participation.
- Create **parcel-level water use allocations** based on geographic location and climate conditions, per parcel based on its respective irrigable area which will allow for more specific and efficient water management.
- **Identify inefficient water users and properties** with large areas of irrigable land and non-functional turf and target those users and properties with focused outreach for water use efficiency rebates and turf replacement programs, thereby improving water efficiency and conservation as well as drought management in the region.
- Facilitate the creation of **more accurate water resource demand forecasts**, which are essential in managing water supply reliability effectively, through use of parcel-level water use allocations.
- **Better comply with regulations** on agency-wide water budgets, water efficiency standards, and associated reporting (California Senate Bill 606 and Assembly Bill 1668).
- Further TVMWD's and its member agencies' efforts to **improve water supply reliability in the face of ongoing drought and climate change** conditions.

Furthermore, the TVMWD service area includes wetlands, creeks, rivers, ponds, reservoirs, and basins serving as habitat to multiple federally endangered and threatened species, including but not limited to the Santa Ana sucker, San Bernardino kangaroo rat, coastal California gnatcatcher, arroyo toad, southwestern willow flycatcher, California condor, and least bell's vireo. Endangered and threatened plant species that may be present include but are not limited to thread-leaved brodiaea, Braunton's milk-vetch, Nevin's barberry, and slender-horned spineflower. Ongoing and anticipated drought cycles make these species more vulnerable by introducing additional challenges to maintaining suitable habitat. One of the project benefits of decreased outdoor water use will offset drought impacts to the habitats of threatened and endangered species in the TVMWD service area by keeping more water available for habitat through reduced use of local surface and groundwater supplies by member agencies. This also supports the goals and objectives of the Upper Santa Ana River Habitat Conservation Plan, a regional program to protect, enhance, and restore habitat for covered species.

E.1.2. Evaluation Criterion B – Project Benefits

Identification of Project Need

Through development of Urban Water Management Plans by TVMWD and its member agencies, TVMWD identified the need for increased water use efficiency and conservation to improve water supply reliability. Considering this need, TVMWD is committed to diversifying its existing supply portfolio and considers water use efficiency as a core supply in addition to imported, recycled, and local groundwater supplies. In collaboration with its multiple and diverse member agencies, TVMWD has identified the need to generate and disseminate water use efficiency data to enhance water resource management efforts. Several of TVMWD's

member agencies have provided letters of support for this project, indicating their need for the data that will be made available through the proposed project.

Application of Tool

The proposed water use efficiency dashboard will result in the creation of an applied science tool that will be utilized by water resource managers in the TVMWD service area. The tool will also provide a model for development that is highly likely to be utilized by other Metropolitan member agencies, as well as water resource managers throughout Southern California and the West, to understand and manage water use, forecasting, and budgeting at the parcel-level. This model has been completed by many other agencies in Southern California, such as Moulton Niguel Water District, Irvine Ranch Water District, and many retail agencies in the Santa Ana River Watershed.

TVMWD identified the need for the proposed project during the course of its regular meetings with the water resource managers of its member agencies as well as during preparation of its Urban Water Management Plan. TVMWD will spearhead development of the proposed water use efficiency dashboard and will be supported by its member agencies as project partners, who will coordinate with TVMWD and its technical consultants to refine data for each water agency (**Figure 4**). Member agencies will also be engaged to review the draft dashboard through participation in a workshop, and TVMWD will host 2 trainings for member agencies to demonstrate use of the dashboard and provide examples of how data can be utilized to improve the effectiveness of water resources management.

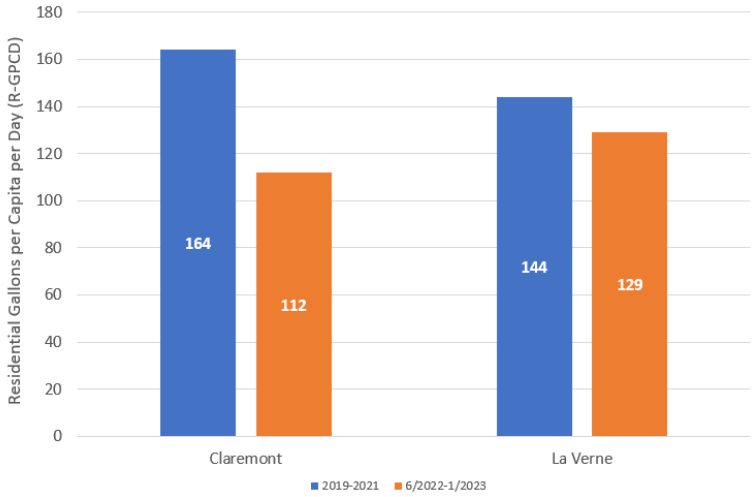
Figure 4 Project Partnership Structure

Once the water use efficiency dashboard is published, the parcel-level data will immediately be made available to water resource managers of TVMWD and its member agencies to inform water resource management actions and decisions. While intermittent data management and

updates will be required once the dashboard is published, data will be accessible and ready for immediate use. Water resource managers at TVMWD and its member agencies will be able to promptly begin incorporating the parcel-level water use data into water management decisions related to water use efficiency, conservation measures, and demand forecasting.

The results of the water use efficiency dashboard will be transferrable to other users and locations. Other water resource managers at Metropolitan member agencies may wish to use the same aerial mapping dataset from Metropolitan to create similar tools to improve water use efficiency in their service areas. In addition, other water resource managers in the West may also desire to perform a similar aerial mapping study as that completed by Metropolitan and create a similar tool as the proposed project using that data. TVMWD will make its methodology, dashboard, and user guide available to all interested water resource managers who wish to pursue a similar project.

Project Benefits



The proposed project will improve water management within the TVWMD service area to a great extent because it will generate and disseminate water use data to TVMWD and its member agencies at the parcel-level.[10] The provision of this data will enhance the accuracy of calculations utilized to estimate water usage, demand forecasting, and water budget allocations at a scale and level of specificity not currently possible. In addition, targeted outreach to inefficient water users could achieve up to a 30 percent reduction in parcel-level water usage, as evidenced by the focused outreach conducted as part of the Level 5 emergency conservation measures enacted by TVMWD for the SWP-dependent areas in 2022. For example, as shown in **Figure 5**, during the Emergency Water Shortage Conditions between June 2022 and January 2023, the average residential gallons per capita per day (R-GPCD) was reduced from its prior 3-year average of 164 to 112, a 32 percent voluntary reduction in residential water use as a result of efforts by the retail water agency Golden State Water Company – Claremont. Similarly, the average R-GPCD for La Verne was reduced from its prior 3-year average of 144 to 129, an 11 percent voluntary reduction in residential water use, as a result of efforts by the City of La Verne. Furthermore, if the parcel-level data is used to provide targeted outreach to properties with large areas of non-functional turf that results in turf replacement with drought-tolerant landscapes, the project would result

[10] Detailed data will be provided only to TVMWD and its member agencies due to confidentiality agreements.

in conservation of approximately 356 gallons of water per year per square foot of turf replaced.[11]

Complementing Other Efforts

The project will complement and add value to the aerial mapping study conducted by Metropolitan in 2022 by leveraging its dataset to the benefit of TVMWD and its member agencies. The proposed aerial mapping component of the project will be coordinated with other regional entities, such as the Los Angeles County Department of Public Works and Metropolitan, to obtain high-resolution data that provides parcel-level information currently not available to the extent that is proposed by this project. This coordination with other regional agencies will achieve time and cost efficiencies and create a common dataset that is updated on a periodic basis. The project will apply a similar methodology to that used successfully by Metropolitan to estimate non-functional turf at a regional level while also expanding on that methodology to obtain non-functional turf estimates at a parcel-level and extract other valuable parcel-level information, such as current water use, total irrigable area, and water budgets. The development of this dashboard by TVMWD will also serve as a model to other Metropolitan member agencies who can similarly use Metropolitan's aerial mapping dataset and TVMWD's water use efficiency dashboard methodology to develop their own similar water use efficiency dashboards.

E.1.3. Evaluation Criterion C – Project Implementation

Approach and Methodology

As noted in the work plan outlined previously under "Detailed Project Description" and shown on **Figure 6**, once the agreement with Reclamation is executed, TVMWD will draft and release multiple Request for Proposal notices to solicit an aerial mapping service and a technical consultant to prepare the water use efficiency dashboard and toolkits. TVMWD will also obtain the aerial mapping dataset from Metropolitan for its service area. Once a technical consultant is selected, the consultant will process and refine the aerial mapping data collected by Metropolitan using GIS modeling and tools (e.g., ArcGIS, QGIS, other GIS software) and translate that data into a user-friendly online dashboard tool with features that produce outputs with parcel-level data on water use, irrigable land, non-functional turf, and water use allocations, among other attributes. Once the draft dashboard has been prepared, TVMWD will hold a workshop with its member agencies and Reclamation to solicit input on dashboard functionality. TVMWD will then have its consultant incorporate feedback from the workshop and prepare the final dashboard for publication. At this stage, the consultant will also prepare the technical user guide. Once the final dashboard is published, TVMWD will hold 2 trainings with its member agencies to demonstrate use of the dashboard and provide examples of how data can be updated and utilized to improve the effectiveness of water resources management.

[11] Based on quantified water savings from the California Friendly Turf Replacement Incentive Program – Southern California, which indicated that 2,745 acre-feet of water was conserved by replacing 2,439,025 square feet of turf. Available at: https://www.usbr.gov/lc/socal/reports/MWDturfreduction.pdf

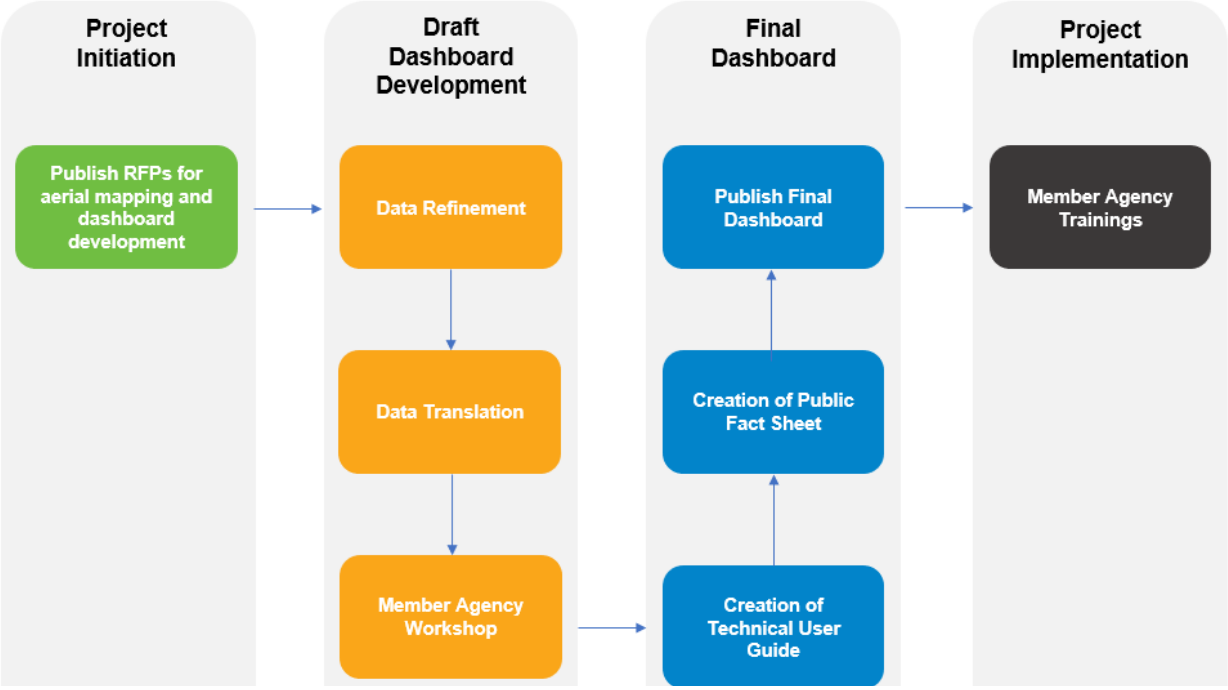


Figure 6 Proposed Approach for Project Development

Work Plan

A detailed outline of the proposed work plan is included in Section 1.4, *Detailed Project Description*, with additional information provided in this section. On the following pages, Table 1 provides an estimated project schedule that shows the stages and duration of the proposed work as well as milestones for each major task and start/end dates for each task and milestones, and Table 2 provides the estimated cost for each task.

Product Description

The final product of the proposed project will be aerial imagery with high resolution and the water use efficiency dashboard, an online tool with a map of the TVMWD service area by member agency and downloadable, parcel-level datasets. Outputs that may be obtained via the dashboard may include maps displaying various data at the parcel level, reports or tables generated via the dashboard with data at the parcel level, and metadata regarding the dashboard. In addition, a brief user guide will accompany the dashboard.

Project Partners

Project partners will consist of TVMWD, as the project applicant, and its 13 member agencies. TVMWD will spearhead the creation of the water use efficiency dashboard by taking lead on development of the work plan and tool and will be engaged throughout the project's planning, development, and implementation. Member agencies will coordinate with TVMWD to refine data, review and provide input to finalize the draft tool through participation in a TVMWD-led workshop, and attend 2 trainings, hosted by TVMWD, to learn how to effectively use the tool. Once the water use efficiency dashboard is published, the parcel-level data will immediately be

Table 1 TVMWD Water Use Efficiency Dashboard Preliminary Project Schedule

	2024										2025												2026	
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
	MONTH																							
Project Stage	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Task 1: Develop a Detailed Work Plan																								
Task 2: Develop the Water Use Efficiency Dashboard																								
Task 3: Provide Training on Use of the Water Use Efficiency Dashboard																								
Task 4: Manage Agreement with Reclamation and Project Management																								

KEY MILESTONES

= Selection of technical consultant

= Publication of final dashboard

= Workshop on draft dashboard

= Trainings for member agencies on dashboard

Table 2 Estimated Project Cost by Task

Task	Estimated Cost
Task 1 Develop a Detailed Work Plan	$10,262.30
Task 2 Develop the Water Use Efficiency Dashboard	$143,477.00
Task 3 Provide Training on Use of the Water Use Efficiency Dashboard	$3,383.00
Task 4 Manage Agreement with Reclamation and Project Management	$11,659.00
TOTAL PROJECT COST	**$168,781.30**

made available to water resource managers of TVMWD and its member agencies. Thus, project partners will be engaged during all stages of the proposed project, including tool development and implementation.

Key Personnel and Consultants

TVMWD staff that will serve as key personnel during development of the proposed project are listed below. Staff at TVMWD have experience developing similar programs and tools at other agencies; however, TVMWD does not have staff in-house to develop the technical tools for the proposed project and will rely on the expertise of technical consultants to develop the dashboard. TVMWD does have experience in managing and accomplishing major endeavors, including its capital improvements program, Urban Water Management Plan and Strategic Plan, water quality monitoring reporting, and participation in development of the Strategic Plan for the Six Basins and its associated Environmental Impact Report. This experience will equip staff to successfully execute the proposed project. Upon entering into a financial assistance agreement with Reclamation, TVMWD is prepared to immediately proceed with the proposed project.

Matthew Litchfield, PE – General Manager, TVMWD. Matthew Litchfield is a licensed civil engineer and has a bachelor's degree in civil engineering from the University of Arizona. Matthew has over 20 years of experience in the water and wastewater industry. As a seasoned professional with a proven background in water and wastewater agency executive management positions, Matthew has developed a skill set that fosters collaboration amongst elected officials as well as staff.

Sylvie Lee, PE – Chief Water Resources Officer, TVMWD. Sylvie Lee is a licensed civil engineer and has a master's degree in civil engineering from University of California Los Angeles and a bachelor's degree in chemical engineering from University of California Riverside. Sylvie has over 20 years of experience in water resources planning and currently coordinates efforts among TVMWD's 13 member agencies and with Metropolitan to ensure water supplies meet the region's needs in a reliable and cost-effective manner.

Kevin Panzer, PE – Assistant Engineer, TVMWD. Kevin Panzer is a licensed civil engineer and has a bachelor's degree in civil engineering from California State University, Long Beach. Kevin has over 12 years of experience in water and wastewater industries and has developed unique perspectives obtained from both in-field construction and engineering design. Kevin is

responsible for assisting in the development of the TVMWD's water resource planning and capital improvement projects.

Technical Consultants. Technical consultants will be retained to provide aerial imagery and develop the dashboard. Requests for Proposals will be released during Task 1 of the proposed work plan, and TVMWD will select consultants based on technical skill capabilities related to aerial imagery and data processing, the creation of user-friendly online tools and associated user guides, and data dissemination; relevant expertise in developing similar types of dashboards for other entities; proposed work tasks and schedule; and cost.

E.1.4. Evaluation Criterion D – Dissemination of Results

Dissemination of Tool

Once the proposed dashboard is online, its availability will be communicated via email and other online channels to TVMWD employees, as well as to water resource managers at TVMWD member agencies. If needed, user credentials will be issued to provide access to the dashboard. A brief user guide with basic information on how to utilize the tool and a summary of the methodology and analysis used to create the tool will also be disseminated via email and will be made available as part of the online dashboard as well. In addition, TVMWD will host 2 trainings with water resource managers at its member agencies to demonstrate use of the dashboard and provide examples of how data can be utilized to improve the effectiveness of water resources management.

TVMWD will seek to leverage opportunities, such as regional managers meetings and workshops, to share the methodology, development process, and utilization of the dashboard with other water resource managers at Metropolitan member agencies who may wish to use the same aerial mapping dataset from Metropolitan to create similar tools to improve water use efficiency in their service areas. Furthermore, if the opportunity arises, TVMWD in collaboration with Metropolitan staff will present the project at a conference targeted at water resource managers, such as an Association of California Water Agencies conference or an Urban Water Research Institute conference, to share the methodology, development process, and utilization of the dashboard with other water resource managers in the West who may benefit from the creation of a similar tool in support of their water management objectives.

E.1.5. Evaluation Criterion E – Presidential and DOI Priorities

Climate Change

As described in the TVMWD and member agency Urban Water Management Plans, water supply in the region consists of 50 to 60 percent imported water from the SWP and Colorado River. Imported water supplies are becoming increasingly uncertain as a result of climate change, with the SWP-dependent areas particularly vulnerable because they do not have access to other imported supplies, and use of their only other supply (groundwater) requires blending with imported water. Low annual SWP allocations have already created challenges in meeting water demands in the SWP-dependent areas as well as the rest of TVMWD's service area. As

such, there is a critical need to address water supply reliability challenges and enhance operational flexibility due to climate change.

Because the project will provide data that will identify water use inefficiencies and provide data for potential compliance with legislation and regulations related to "conservation as a way of life," the project will enable TVMWD and its member agencies to make more informed water management decisions and pursue targeted water conservation and efficiency measures, thereby facilitating more efficient water use in the service area. With TVMWD's current reliance on imported water and with imported water supplies expected to be less reliable as a result of future climate conditions, it is critical for TVMWD at this juncture to reduce demand for imported water. Given that outdoor water use accounts for a significant portion of demand, the project benefits of providing parcel-level data on total irrigable areas and non-functional turf will enable local water managers to identify and target inefficient water users with large areas of irrigable land and non-functional turf for water efficiency rebate and turf replacement programs to a greater degree than is currently possible. By resulting in additional water conservation and efficiency, the project will improve water supply reliability and sustainability and reduce demand pressures on SWP and Colorado River supplies. In doing so, the project will increase local, long-term resilience to climate change, including drought, and help combat the effects of the climate crisis. Furthermore, by reducing reliance on imported water supplies, the project will also reduce the magnitude of greenhouse gas emissions generated by conveyance and treatment of these supplies. Thus, the project will not only build long-term drought resilience, but also reduce climate pollutant emissions associated with water use per parcel.

As water supplies become diminished and more variable due to climate change, the water use efficiency dashboard will allow TVMWD to monitor water use and forecast water demand more accurately and effectively than is possible with current data and tools. Because TVMWD and its member agencies will be able to track water usage and water use inefficiencies at a more granular scale, water consumption can be monitored and estimated at a greater level of specificity. Understanding exactly how much water individual parcels require will identify areas where water is overallocated, thus identifying water that can be conserved to enhance supply reliability. Importantly, the project will provide TVMWD and its member agencies with the ability to create parcel-level water use allocations based on geographic location and climate conditions, which will allow for more specific and efficient water management.

Disadvantaged and Underserved Communities

As shown in **Figure 7**, TVMWD and its member agencies provide water services to several disadvantaged and underserved communities (DACs). In particular, multiple DACs are concentrated in Pomona, Covina, and Rowland Heights, all of which are served by TVMWD member agencies. (The identification of DACs is based on the Council of Environmental Quality's Climate and Economic Justice Screening Tool.)

Due to low income levels, DACs also likely experience high and/or persistent poverty levels, high unemployment, distressed neighborhoods, disproportionate impacts from climate change, reduced access to healthcare, and high housing, transportation, and energy cost burdens. Several communities within the service area have been classified by the California Office of Environmental Health Hazards Assessment as within the 80th and 90th percentiles for high

pollution burden, high unemployment, high housing cost burden, and high poverty levels relative to all communities throughout California.[12]

The proposed project has the potential to benefit all of TVMWD's service area. The project will enable TVMWD and its member agencies to improve the effectiveness of water management, water demand forecasting, and water efficiency and conservation measures. In doing so, the project will benefit DACs located through the TVMWD service area by enhancing water supply reliability and efficiency and thereby mitigating the effects of climate change, which are likely to have a disproportionately greater impact on these communities due to low income levels and limited access to resources. The information can be used to advocate for and develop programs that provide a service and benefit to DACs.

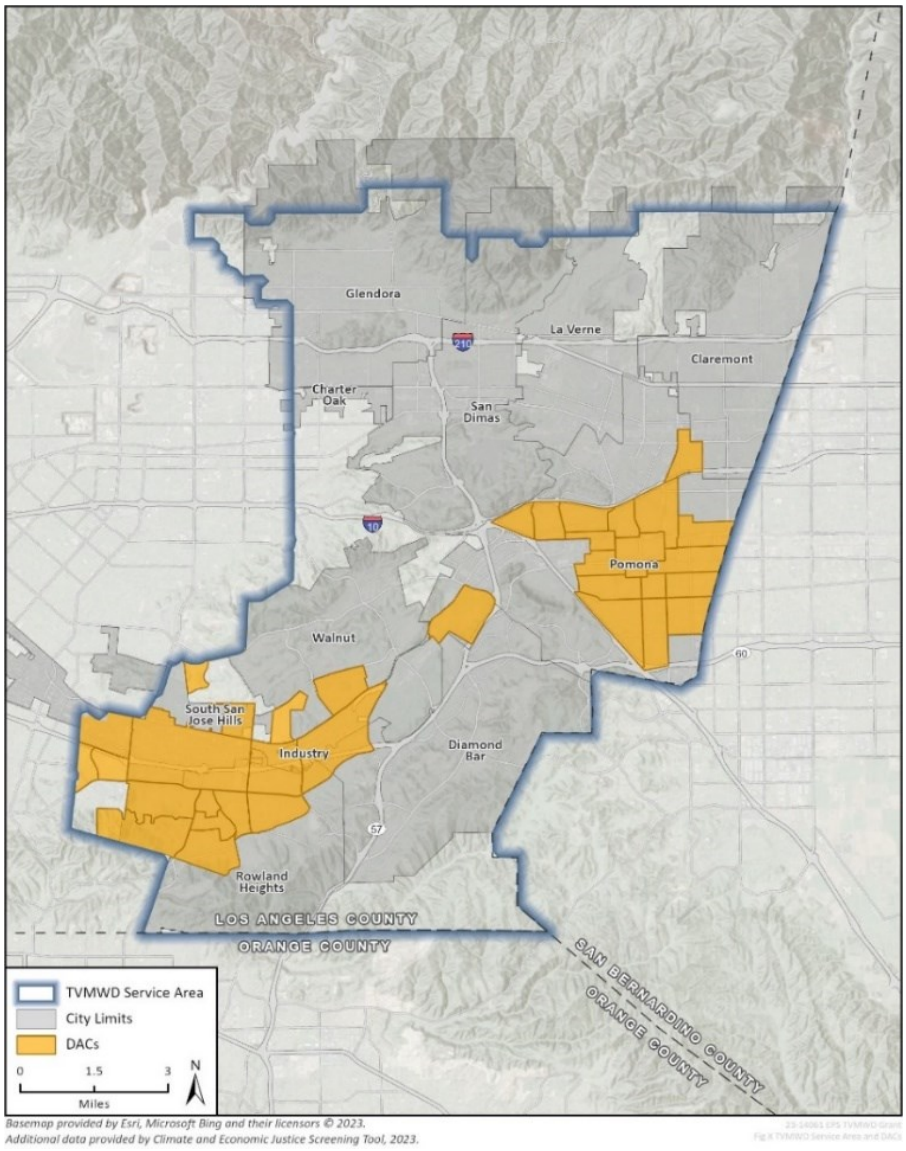


Figure 7 DACs in TVMWD Service Area

Tribes

There are no federally recognized Tribes within the TVMWD service area. The proposed project does not have a connection to Reclamation's Tribal trust responsibilities or a Reclamation activity with a Tribe.

[12] California Office of Environmental Health Hazards Assessment. 2023. CalEnviroScreen 4.0. Available at: https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-40

4 Project Budget

As shown in Table 3, the total estimated cost for preparation of the project is $168,781.30, of which TVMWD is committed to providing $84,390.65 as a non-federal match. Project funding will be provided through TVMWD's operating budget via water sales, assessments, and property taxes. Funding from other sources other than Reclamation will not be requested. The full budget proposal with narrative is provided as an attachment.

Table 3 Summary of Non-Federal and Federal Funding Sources

Funding Sources	Amount
1. Three Valleys Municipal Water District	$84,390.65
Non-Federal Subtotal	$84,390.65
Requested Reclamation Funding	$168,781.30

5 Additional Materials

5.1 Environmental and Cultural Resources Compliance

The project will involve data visualization and will not entail construction or earth-disturbing development that will impact the surrounding environment (e.g., soil, air, water, animal habitat) in the project area. As such, the project will not affect endangered or threatened species, wetlands or surface waters, existing irrigation systems, historic resources, or archaeological sites, and no tribal lands will be affected. The project will also not have a disproportionately high and adverse effect on low-income or minority populations because no environmental impacts will occur. In addition, the project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

5.2 Required Permits or Approvals

No permits or approvals are required for development of the proposed project.

5.3 Overlap or Duplication of Effort Statement

There is no overlap between the proposed project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel. The proposal submitted for consideration under this program is not in any way duplicative of any proposal or project that has been or will be submitted for funding consideration to any other potential funding source—whether it be federal or non-federal.

5.4 Letters of Support and Letters of Participation

Please see letters of support provided in Appendix A.

5.5 Conflict of Interest Disclosure

No actual or potential conflict of interest exists at the time of submission. TVMWD will continue to take appropriate steps to avoid conflicts of interest in its responsibilities under or with respect to Federal financial assistance agreements. TVMWD will continue to establish and enforce internal controls that include procedures to identify, disclose, and mitigate or eliminate identified conflicts of interest. TVMWD will notify the Financial Assistance Officer in writing of any conflicts of interest that may arise during the life of the award, including those that have been reported by subrecipients.

5.6 Uniform Audit Reporting Statement

TVMWD will not be expending $750,000 or more in federal award funds in its fiscal year and thus is not required to submit a Single Audit report.

5.7 Certification Regarding Lobbying

TVMWD will not be expending $100,000 or more in federal funding and thus is not required to submit the certification statements regarding lobbying.

5.8 Official Resolution

A draft resolution is included below. The official resolution will be signed on November 15, 2023 and will be forwarded to Reclamation within 30 days after the application deadline (by November 16, 2023).

RESOLUTION NO. 23-XX-XXX

RESOLUTION OF THE BOARD OF DIRECTORS OF THREE VALLEYS MUNICIPAL WATER DISTRICT AUTHORIZING TVMWD'S APPLICATIONS FOR THE BUREAU OF RECLAMATION WATERSMART: APPLIED SCIENCE GRANTS PROGRAM FOR FISCAL YEAR 2023, WATERSMART: PLANNING AND PROJECT DESIGN GRANTS PROGRAM FOR FISCAL YEAR 2023, AND WATERSMART DROUGHT RESPONSE PROGRAM: DROUGHT RESILIENCY PROJECTS FOR FISCAL YEAR 2024

WHEREAS, the Three Valleys Municipal Water District ("TVMWD") is a municipal water district established pursuant to Section 71000 et seq. of the California Water Code; and

WHEREAS, TVMWD is a member agency of The Metropolitan Water District of Southern California ("MWD") and is responsible for the sale and distribution of the water it purchases from MWD; and

WHEREAS, imported water supply in the TVMWD service area is facing a growing list of challenges associated with prolonged recurring droughts, increasingly frequent regulatory cutbacks on State Water Project deliveries, climate change, aging infrastructure, and growing population; and

WHEREAS, the United States Department of the Interior, Bureau of Reclamation, under the WaterSMART: Applied Science Grants Program for Fiscal Year 2023, WaterSMART Planning and Project Design Grants Program for Fiscal Year 2023, and WaterSMART Drought Response Program: Drought Resiliency Projects for Fiscal Year 2024 will make funding available to qualifying applicants; and

WHEREAS, the Board of Directors of TVMWD has identified projects that exemplify the objectives of these WaterSMART grants; and

WHEREAS, TVMWD agrees to the administration and cost sharing requirements of the WaterSMART Grant criteria.

NOW THEREFORE BE IT RESOLVED by the TVMWD's Board of Directors as follows:

1. The Board of Directors has reviewed and supports the grant applications submitted to the Bureau of Reclamation for the WaterSMART: Applied Science Grants Program for Fiscal Year 2023, WaterSMART Planning and Project Design Grants Program for Fiscal Year 2023, and WaterSMART Drought Response Program: Drought Resiliency Projects for Fiscal Year 2024.
2. This resolution shall be a component part of TVMWD's grant applications.
3. TVMWD is capable of providing the amount of funding and/or in-kind contributions specified in the grant application funding plans.
4. TVMWD is hereby authorized to receive, if awarded, the WaterSMART: Applied Science Grants Program for Fiscal Year 2023, WaterSMART Planning and Project

Design Grants Program for Fiscal Year 2023, and/or WaterSMART Drought Response Program: Drought Resiliency Projects for Fiscal Year 2024 funding and will make a good faith effort to negotiate and enter into grant or cooperative agreements with the Bureau of Reclamation within established deadlines for the receipt and administration of said grant funds.

5. The General Manager, or his designee, is hereby authorized to take any and all actions which may be necessary for the negotiation, completion, and execution of the grant or cooperative agreements and to take any and all other actions which may be necessary for the receipt and administration of the grant funding in accordance with the requirements of the Bureau of Reclamation.
6. This Resolution shall be effective as of the date of adoption.

ADOPTED and **PASSED** at a meeting of the Three Valleys Municipal Water District's Board of Directors on this 15th day of November 2023 by the following vote:

AYES:
NOES:
ABSTAIN:
ABSENT:

_____

Jody Roberto
President, Board of Directors

ATTEST:

_____

Carlos Goytia
Secretary, Board of Directors

SEAL:

Appendix A

Letters of Support

CITY OF COVINA www.covinaca.gov
125 East College Street • Covina, CA 91723-2199

October 2, 2023

United States Bureau of Reclamation
Water Resources and Planning Office
Attn: Ms. Avra Morgan
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

Subject: **Funding Opportunity Announcement No: R23AS00446**
WaterSMART Applied Science Grants for Fiscal Year 2023 Funding Opportunity

To the Selection Committee:
The City of Covina is pleased to support TVMWD in its submission of a grant application to the U.S. Bureau of Reclamation (USBR) in response to the Funding Opportunity Announcement No: R23AS00446, WaterSMART Applied Science Grants for Fiscal Year 2023. We are excited that TVMWD has proposed creation and implementation of a Water Use Efficiency Dashboard that would provide water managers such as ourselves with information to effectively allocate and manage water use within our service area.

We are particularly supportive of this inclusive project as it will support continued sustainable management of imported and groundwater supplies within the TVMWD service area by enhancing water conservation efforts across TVMWD's member agencies. Developing this readily useful tool will advance Covina's ability to effectively allocate and manage water use in our service area as well as develop targeted conservation programs and outreach materials and prepare more accurate water demand forecasts moving forward. This effort will allow us to increase water use efficiency and build long-term water resiliency for the region, which the City of Covina strongly supports.

We are excited to be a part of this important project and look forward to utilizing the proposed Water Use Efficiency Dashboard to improve Covina's water management efforts in the face of ongoing and cyclic drought and climate change conditions. We hope that this expression of support is helpful to TVMWD in their efforts to secure grant funding assistance to implement the proposed project.

Sincerely,

Andy Bullington

Director of Public Works

WALNUT VALLEY WATER DISTRICT

271 South Brea Canyon Road • Walnut, California 91789-3002
(909) 595-7554 • Fax: (909) 444-5521
WALNUTVALLEYWATER.GOV

October 12, 2023

United States Bureau of Reclamation
Water Resources and Planning Office
Attn: Ms. Avra Morgan
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

Subject: Funding Opportunity Announcement No: R23AS00446
WaterSMART Applied Science Grants for Fiscal Year 2023 Funding Opportunity

To the Selection Committee:

The Walnut Valley Water District is pleased to support TVMWD in its submission of a grant application to the U.S. Bureau of Reclamation (USBR) in response to the Funding Opportunity Announcement No: R23AS00446, WaterSMART Applied Science Grants for Fiscal Year 2023. We are excited that TVMWD has proposed creation and implementation of a Water Use Efficiency Dashboard that would provide water managers such as ourselves with information to effectively allocate and manage water use within our service area.

We are particularly supportive of this inclusive project as it will support continued sustainable management of imported and groundwater supplies within the TVMWD service area by enhancing water conservation efforts across TVMWD's member agencies. Developing this readily useful tool will advance Walnut Valley Water District's ability to effectively allocate and manage water use in our service area as well as develop targeted conservation programs and outreach materials and prepare more accurate water demand forecasts moving forward. This effort will allow us to increase water use efficiency and build long-term water resiliency for the region, which Walnut Valley Water District strongly supports.

We are excited to be a part of this important project and look forward to utilizing the proposed Water Use Efficiency Dashboard to improve Walnut Valley Water District's water management efforts in the face of ongoing and cyclic drought and climate change conditions. We hope that this expression of support is helpful to TVMWD in their efforts to secure grant funding assistance to implement the proposed project.

Sincerely,

Erik Hitchman, P.E.
General Manager
Chief Engineer

October 3, 2023

United States Bureau of Reclamation
Water Resources and Planning Office
Attn: Ms. Avra Morgan
Mail Code: 86-63000
P.O. Box 25007
Denver, CO 80225-0007

Subject: Funding Opportunity Announcement No: R23AS00446
WaterSMART Applied Science Grants for Fiscal Year 2023 Funding Opportunity

To the Selection Committee:

Rowland Water District is pleased to support TVMWD in its submission of a grant application to the U.S. Bureau of Reclamation (USBR) in response to the Funding Opportunity Announcement No: R23AS00446, WaterSMART Applied Science Grants for Fiscal Year 2023. We are excited that TVMWD has proposed the creation and implementation of a Water Use Efficiency Dashboard that would provide water managers such as us with information to effectively allocate and manage water use within our service area.

We are particularly supportive of this inclusive project as it will support continued sustainable management of imported and groundwater supplies within the TVMWD service area by enhancing water conservation efforts across TVMWD's member agencies. Developing this readily useful tool will advance Rowland Water District's current ability to effectively allocate and manage water use in our service area as well as develop targeted conservation programs and outreach materials and prepare more accurate water demand forecasts moving forward. This effort will allow us to increase water use efficiency and build long-term water resiliency for the region, which Rowland Water District strongly supports.

We are excited to be a part of this important project and look forward to utilizing the proposed Water Use Efficiency Dashboard to improve Rowland Water District's water management efforts in the face of ongoing and cyclic drought and climate change conditions. We hope that this expression of support is helpful to TVMWD in their efforts to secure grant funding assistance to implement the proposed project.

Sincerely,

Tom Coleman
General Manager