



## **WaterSMART: Water Recycling and Desalination Planning**

### **Pure Water San Diego Program, Phase 2**

**Technical Proposal  
(R23AS00076)**

**Prepared for:  
United States Bureau of Reclamation**

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**February 27, 2023**



**TABLE OF CONTENTS**

<b>Chapter 1 Executive Summary</b>	<b>3</b>
<b>Chapter 2 Project Location</b>	<b>4</b>
<b>Chapter 3 Project Description</b>	<b>5</b>
<b>Chapter 4 Technical Proposal: Evaluation Criteria</b>	<b>6</b>
Evaluation Criterion 1: Project Planning and Analysis	6
Evaluation Criterion 2: Stretching Water Supplies	10
Evaluation Criterion 3: Environment and Water Quality	13
Evaluation Criterion 4: Department of the Interior Priorities	15
Evaluation Criterion 5: Watershed Perspective and Stakeholder Involvement	18
<b>Chapter 5 Project Budget</b>	<b>20</b>
Budget Proposal	20
Budget Narrative	20
<b>Chapter 6 Environmental and Cultural Resources Compliance</b>	<b>21</b>
<b>Chapter 7 Letters of Support</b>	<b>21</b>
<b>Chapter 8 Uniform Audit Reporting Statement</b>	<b>21</b>

**LIST OF TABLES**

Table 4-1	City’s Future Need for Purchased Water from SDCWA	6
Table 4-2	Future Water Supply for the City	7
Table 4-3	Reduction of Total Imported Water Supplies	10
Table 4-4	Federal Listed Species in the Bay-Delta	15
Table 4-5	Federal Listed Species in the Lower Colorado River	15

**LIST OF FIGURES**

Figure 2-1	Pure Water Program Map	4
Figure 4-1	LRWRP 2035 Climate Change Baseline	12
Figure 4-2	LRWRP 2035 Climate Change Hybrid 2 (Including Pure Water Program)	12

**LIST OF APPENDICIES**

Appendix A	SF-424: Application for Federal Assistance	22
Appendix B	SF-424A: Budget Information – Non-Construction Programs	26
Appendix C	SF-424B: Assurances for Non-Construction Activities	30
Appendix D	SF-LLL: Disclosure of Lobbying Activities	33

## Chapter 1 Executive Summary

### Application Information

**Date:** February 23, 2023

**Applicant Name:** City of San Diego

**City, County and State:** City of San Diego, San Diego County, California

The City of San Diego is applying to the WaterSMART: Water Recycling and Desalination Planning for \$750,000 for the Pure Water San Diego Phase 2 planning (Project). This proposal comprises the second phase of the Pure Water San Diego Program (Pure Water Program). Funding received will aid in the development of planning studies for Phase 2. The planning studies consist of a review of the goals of Phase 2 of the Pure Water Program, feasibility studies of the locations of the proposed facility and pipeline sites, studies of sea level and river floodplain surrounding the proposed locations and researching and updating of alternative analysis to document the pros and cons of multiple options for pipeline routes and facilities along with planning level costs for each alternative. The objective of Pure Water Phase 2 is to collect wastewater for up to 53 million gallons per day (mgd) of locally-produced, safe, drought-resistant drinking water for the central part of San Diego.

This proposal consists of multiple planning and feasibility studies that will be complete by Fall 2025.

Planning efforts are being done for the Pure Water Program located within San Diego County, and do not involve Federal land.



## Chapter 2 Project Location

The Project is located in California in San Diego County. The new Pure Water Program facilities, which will be spread in various parts of the City as illustrated in Figure 2-1, are grouped into two geographical areas to facilitate Program Implementation. The North City Phase 1 project is already under construction which is identified in the map below as the Morena Pump Station through the NCWRP, NCPWF, NCPWFS to the Miramar Reservoir. Phase 2 planning activities will occur within the Central Area.

Figure 2-1: Pure Water Program Map



## Chapter 3 Project Description

**Applicant Category:** Funding Group II

**Eligibility of Applicant:** Anticipated total project cost for the construction of Pure Water San Diego Phase 2 is over \$500,000,000. The City of San Diego is a California Municipality with water delivery authority.

Pure Water Phase 2 will add reliability and resiliency to the City of San Diego's water supply. Collected wastewater will undergo a 5 step treatment process (ozonation, biological activated carbon filters, membrane filtration, reverse osmosis, and ultraviolet disinfection) that will recycle it into pure water. This direct or indirect potable reuse project will use reservoirs as storage for the purified water. From there, the water will be drawn into an existing water treatment plant and further treated to potable water standards before being distributed to homes and businesses. Pure Water Phase 1 was the first project in the region to start construction on a reclaimed water project using surface water augmentation and Pure Water Phase 2 will follow in its footsteps. The objective of Pure Water Phase 2 is to collect wastewater for up to 53 million gallons per day (mgd) of locally-produced, safe, drought-resistant drinking water for the central part of San Diego. Currently, more than 85% of the City of San Diego's water is imported; however, Pure Water San Diego is expected to provide nearly half the water supply for the City of San Diego. With the price of imported water tripling in the past 15 years and with no end in sight, having a locally-produced water source can mitigate the price increases for both the City of San Diego and our customers, which is an economic benefit for the entire City. Being drought-resistant by producing our own water also mitigates impacts resulting from being dependent on imported water. Imported water sources are at risk of planned and unplanned reductions from the state and federal government and the infrastructure to transport the water here is also at risk of failure.

The second goal of the project is to reduce the amount of wastewater flowing to the Point Loma Wastewater Treatment Plant (PLWTP), along with the associated pollutant loads. PLWTP is the main wastewater treatment plant for the City of San Diego and the 11 other members of the Metropolitan Wastewater Joint Powers Authority, treating approximately 175 mgd generated in a 250 square mile area by more than 2.2 million residents. It is owned and operated by the City of San Diego. It is currently provides chemically enhanced primary treatment, which falls short of federal treatment requirements, and has been operating on a modified permit since 1995. By reducing the flow, the discharge from PLWTP would be considered equivalent to secondary treatment without spending multiple billions of dollars to upgrade the plant.

The planning work will consist of various studies and analyses that, when combined, will result in a plan for how to move forward. The planning studies will start with a review of the goals of the program. These goals were set a number of years ago prior to having all the information that currently exists. The City will review whether the schedule goal and production goals are still relevant with the new information. This will be completed by late 2023.



## Chapter 4 Technical Proposal: Evaluation Criteria

### Evaluation Criterion 1 – Project Planning and Analysis (30 points)

#### Subcriterion No.1a – Water Recycling Needs and Opportunities (15 points)

1. Describe the problems and needs in the project area.

The City of San Diego (City) has limited local water sources and relies on importing approximately 85 percent of its water supply. In the past, importing water from the Colorado River and Northern California has been a reliable option, but environmental stresses, court-ordered pumping restrictions in Northern California, and a historic dry period and drought on the Colorado River have reduced the amount of water that can be delivered to San Diego. These circumstances and the possibility of further limitations have intensified the need for new sources of water that are under local control.

2. Describe the current and projected water supplies and demands in the project area; include a discussion on supply and demand imbalances. Additional consideration will be given to proposals that explain how the problems and needs in the area may be impacted by climate change, and/or if supply and demand projections will include climate change information.

The City's current water supplies consist of: (1) capture of local runoff from rainfall within seven of its nine surface reservoirs; (2) recycled water for non-potable water use; (3) limited local groundwater; and (4) water purchased from the SDCWA. Purchased water from SDCWA is the largest portion of the City's overall water supply, accounting for about 85% on average.

Table 4-1 shows the total City water demands and planned local supplies under average weather and hydrological conditions, with the difference between the two representing the need for purchased water. During the forecasted period, the City's average demands on SDCWA are projected to decrease by approximately 34 percent by 2045 as Pure Water Phase 2 comes online.

**Table 4-1 City's Future Need for Purchased Water from SDCWA**

Category	Demand and Supplies (AFY)				
	2025	2030	2035	2040	2045
<b>City water demands: Retail and Wholesale<sup>1</sup></b>	202,865	210,547	217,156	223,598	228,065
<b>Less City local water supplies<sup>2</sup></b>	53,088	69,888	129,248	129,248	129,248
<b>Purchased water from SDCWA<sup>3</sup></b>	<b>149,778</b>	<b>140,660</b>	<b>87,907</b>	<b>94,350</b>	<b>98,816</b>

<sup>1</sup> Represents net future water demands, after future active water conservation resulting from rebates and behavior change is subtracted (see Table3-7).

<sup>2</sup> Includes existing and planned supplies (surface water, groundwater, and recycled water, including Pure Water San Diego Phase 1 and 2.

<sup>3</sup> Represents difference between City water demands and planned local water supplies.

Table 4-2 presents a summary of the current and projected water supplies for the City's service area, assuming average weather conditions or temperatures.

**Table 4-2 Future Water Supply for the City**

Supplies	Demand and Supplies (AFY)				
	2025	2030	2035	2040	2045
<b>Current and Planned Supply</b>					
Recycled Water (City service area only, non-potable)	13,773	13,773	13,773	13,773	13,773
Pure Water Phase 1	16,800	33,600	33,600	33,600	33,600
Pure Water Phase 2			59,360	59,360	59,360
Local Surface Supply	22,015	22,015	22,015	22,015	22,015
City-Lake Cuyamaca Interagency Agreement	400	400	400	400	400
Groundwater	100	100	100	100	100
<b>Total Current and Planned Local Supplies</b>	<b>53,088</b>	<b>69,888</b>	<b>129,248</b>	<b>129,248</b>	<b>129,248</b>
Water Supply from SDCWA (purchased water)	149,778	140,660	87,907	94,350	98,816
<b>Total Water Supplies with SDCWA</b>	<b>202,866</b>	<b>210,548</b>	<b>217,155</b>	<b>223,598</b>	<b>228,064</b>

SDCWA water purchases make up the difference between total water demands and local supplies. With local water supplies, SDCWA will continue to provide approximately 43 percent of the City's water demands, assuming average weather conditions or temperatures through year 2045.

3. Describe how the planning activities will investigate potential uses and markets for reclaimed or desalinated water (e.g., environmental restoration, fish and wildlife, groundwater recharge, municipal, domestic, industrial, agricultural, power generation, and recreation).

Pure Water Phase 2 planning will investigate the potential uses and markets for 53 million gallons per day (mgd) of locally-produced, safe, drought-resistant drinking water for the central part of San Diego. Being drought-resistant by producing our own water will mitigate impacts resulting from being dependent on imported water. Imported water sources are at risk of planned and unplanned reductions from the state and federal government and the infrastructure to transport the water here is also at risk of failure.

4. Describe the source water that will be considered for the project, including location, capacities, existing flows, treatment processes, and quantities of impaired water available to meet the new reclaimed, recycled, or desalinated water demands.

By 2035, Pure Water's Phase 2 will expand repurified water production from 30 to 83 mgd. The City has initiated early planning studies and plans, which include constructing a new pilot plant at Point Loma Wastewater Treatment Plant by 2025 in Central San Diego.

### **Subcriterion No.1b – Evaluation of Project Alternatives (15 points)**

1. Describe the objectives that all alternatives will be designed to meet. What other water supply alternatives and project alternatives will be investigated?

Pure Water Phase 2 is a project with two main goals. First, Pure Water Phase 2 will add reliability and resiliency to the City of San Diego's water supply. Collected wastewater will undergo a 5 step treatment process (ozonation, biological activated carbon filters, membrane filtration, reverse osmosis, and ultraviolet disinfection) that will recycle it into pure water. This direct or indirect potable reuse project will use reservoirs as storage for the purified water. From

there, the water will be drawn into an existing water treatment plant and further treated to potable water standards before being distributed to homes and businesses. Pure Water Phase 1 was the first project in the region to start construction on a reclaimed water project using surface water augmentation and Pure Water Phase 2 will follow in its footsteps. The objective of Pure Water Phase 2 is to collect wastewater for up to 53 million gallons per day (mgd) of locally-produced, safe, drought-resistant drinking water for the central part of San Diego. Currently, more than 85% of the City of San Diego's water is imported; however, Pure Water San Diego is expected to provide nearly half the water supply for the City of San Diego. With the price of imported water tripling in the past 15 years and with no end in sight, having a locally-produced water source can mitigate the price increases for both the City of San Diego and its customers, which is an economic benefit for the entire City. Being drought-resistant by producing our own water also mitigates impacts resulting from being dependent on imported water. Imported water sources are at risk of planned and unplanned reductions from the state and federal government and the infrastructure to transport the water here is also at risk of failure.

The second goal of the project is to reduce the amount of wastewater flowing to the Point Loma Wastewater Treatment Plant (PLWTP), along with the associated pollutant loads. PLWTP is the main wastewater treatment plant for the City of San Diego and the 11 other members of the Metropolitan Wastewater Joint Powers Authority, treating approximately 175 mgd generated in a 250 square mile area by more than 2.2 million residents. It is owned and operated by the City of San Diego. It currently provides chemically enhanced primary treatment, which falls short of federal treatment requirements, and has been operating on a modified permit since 1995. By reducing the flow, the discharge from PLWTP would be considered equivalent to secondary treatment without spending multiple billions of dollars to upgrade the plant.

2. Describe how the planning activities will develop project alternatives (water supply sources, reuse strategies, or treatment technologies) that have been or will be investigated.

The planning work will consist of various studies and analyses that, when combined, will result in a plan for Phase 2. The results of the feasibility studies will feed into the alternative analysis update. The goal of updating the alternative analysis is to produce documentation that demonstrates the pros and cons of multiple options for pipeline routes and facility, along with planning level costs for each alternative. This document serves two purposes. First, it facilitates a discussion which will lead to a final decision on the project locations. Second, it serves as backup documentation for future CEQA submittal which requires assessing the environmental impacts of various alternatives before making a decision. These studies and the updated alternative analysis are expected to be completed by Fall 2024.

3. Provide a general description of the selected project, including project features, benefits, anticipated costs, and analyses conducted.

#### Study of program goals

The planning studies will begin with a review of the goals of the program. These goals were set several years ago before the City had all the information it currently has. The City needs to review whether its schedule and production goals are still relevant with the new information. This will be completed by late 2023.

#### Study of Proposed Facility Sites

Once goals are verified or reset, a number of specific questions needs to be answered with regards to feasibility. The City will have to do more calculations at its proposed facility sites to determine if it has enough space to build the facilities being proposed, whether there is a need to acquire additional adjacent land, or whether there is a need to choose a different location.

#### Study of Sea Level Rise at Proposed Facilities

Additionally, sea level rise needs to be modeled at the proposed location of two major facilities. One proposal is located near the San Diego Bay and the other is adjacent to the San Diego River. The site adjacent to the San Diego River may be in the floodplain of the river and require certain setbacks. Thus, these variables need to be researched and included in the program's model.



### Study of Pipeline Alignment

At the same time the feasibility studies are being conducted for the facility sites, the pipeline alignment will undergo its own feasibility analysis to find routes between all facilities that have enough subsurface space to fit pipes with a diameter expected to be in excess of 50".

### Study to Determine Reservoir Selection

In parallel to the aforementioned feasibility studies for facilities and pipelines, a decision on which reservoir to store Pure Water for Phase 2 is needed. Two reservoirs are being considered – Murray and San Vicente- and a decision to use one or both needs to be made. A few factors to determine the selection of the reservoir(s) have already been researched; however, a more detailed and holistic study needs to be completed. One of the large outstanding items is the regional effects of sending purified water to San Vicente. San Vicente reservoir is shared with other water agencies. The City needs to determine whether the other water agencies would be required to do the monitoring required by our permitting agency, whether their treatment plants would be required to do treatability studies, and how the inter-agency relationships would change if we are co-mingling water. This decision is expected to be made by Summer 2024 so the results can be included in the updated alternative analysis.

### Study on the Central Area Small Scale Facility

A study will be also conducted on the Central Area Small Scale Facility. This facility will begin construction in summer 2023 and is expected to be completed in late 2024. The construction of this facility is not part of this grant request. The purpose of this facility is to build a small version of proposed treatment options that are being discussed for Phase 2. Its location – inside the Phase 2 sewershed and using the same wastewater that will feed into the future Phase 2 facilities – allow us to test the feasibility of different treatment trains before one is ultimately chosen to be used in the full-scale design. This study will test the efficiency, cost, and ease of operation of each treatment train. Because wastewater flow rate and composition vary throughout the year, this study will run for at least 1 year to capture data for all scenarios. This study is expected to be completed by Fall 2025.

### Pre-Design

Once the alternative analysis is complete, predesign of the infrastructure will begin. The entire Phase 2 system will be divided into individual projects and a pre-design will be completed for each one. Individual projects are expected to include a Pure Water Facility, a Water Reclamation Plant, flow equalization basins, at least one pump station, major upgrades to the Alvarado Water Treatment Plant, and dozens of miles of pipeline connecting all the facilities. The total project cost is expected to be more than \$3.5 billion. The pre-design will include looking for conflicting utilities, a preliminary assessment of upgrades needed to meet ADA requirements, preliminary sizing calculations, a preliminary cost estimate, a preliminary schedule, an assessment of the storm water requirements, a preliminary list of permitting needs, calculations of needed power requirements, site surveying, a preliminary geotechnical determination, and various other site specific studies. The predesign will refine the alignments and locations chosen during the alternative analysis and will provide all the background information a designer needs to start their design. This study, which is expected to begin in Fall 2024, is not expected to be completed by Fall 2025.

### Early Site Investigations for Environmental Documentation

In parallel with the pre-design, early site investigations for the environmental document will begin. These early investigations may include plant surveys, animal surveys, noise surveys, hydrology studies, delineating the jurisdictional waters, fault line mapping, and any other study that can be done prior to the start of design. These investigations are expected to begin in early 2025 but are not expected to be completed by Fall 2025.

4. Include a preliminary schedule showing major tasks, milestones, and dates for the planning, design, and construction activities related to the project.

### Preliminary Schedule

The schedule for Pure Water Phase 2 starts in 2023. Planning activities are expected to start in earnest in mid-2023



and be completed by Fall 2024. Pre-design is expected to follow from Fall 2024 to mid-2026. Design is tentatively scheduled for mid-2026 to 2031 and construction is tentatively scheduled from 2031 to 2035.

### E.1.2 Evaluation Criterion 2 – Stretching Water Supplies (20 points)

1. Describe the potential for the project to reduce, postpone, or eliminate the development of new or expanded non-recycled water supplies.

The Project will reduce the need for development of new or expanded non-recycled water supplies. A reduction in imported water supplies is a benefit not only to the City's existing water infrastructure, but also the imported water infrastructure managed by other agencies. The City's water wholesaler, the San Diego County Water Authority (SDCWA), in its 2013 Regional Water Facilities Master Plan Update notes that these projects have the ability to significantly delay or forgo future SDCWA investments in new infrastructure and any decision on new regional supply development projects. These improvements to the water supplies also have the benefit of deferring and/or eliminating scheduled improvements to the City's Metropolitan Sewerage System (Metro System). The Metro System is the largest wastewater system in San Diego County. The system is managed by the City and Participating Agencies and serves a 450-square mile area that includes incorporated areas of the City and 12 cities and districts. The PLWWTP, the main wastewater treatment plant for the Metro System, continues to operate as an advanced primary treatment facility and the ability to operate the plant without secondary upgrades continues to be debated and may not be allowed in the future. The benefits of this Project are twofold, deferring and/or eliminating the secondary upgrade to the PLWWTP by reducing TSS Mass Emissions while creating a new local water supply for the region. The total cost to upgrade the PLWWTP upgrade to secondary treatment is estimated to cost \$2.1 billion dollars and will result in no additional water source.

2. Describe the potential for the project to alleviate pressure on existing water supplies and/or facilities. Please describe the existing water supplies, identify the supplies and/or facilities that will be impacted and explain how they will be impacted by the Project, including quantifications where applicable.

The City receives its imported water from the regional water wholesaler, San Diego County Water Authority (SDCWA). The imported water is a blend of local, State (Bay-Delta) and Federal (Colorado River) waters and varies from year to year based on availability.

The Pure Water Program will produce water locally, it will decrease the need for imported water for the City thereby reducing the existing Federal water supply demand from the Colorado River and diversions from the Bay-Delta. The reduction in imported water demand is summarized in Table 4-3. The Pure Water Program will reduce the need for imported water supplies by 78,120 AFY, with 24,180 AFY reduced from the Bay- Delta and 53,940 AFY reduced from the Colorado River.

**Table 4-3: Reduction of Total Imported Water Supplies**

Program Phase	Accelerated Project Delivery Goals	Location	Reduction Imported Water Bay-Delta (AFY)	Reduction in Imported Water Colorado River (AFY)	Total Reduction Imported Water (AFY)
1	30 mgd (33,600 AFY) (by 2025)	North City	8,736 (14%)	19,488 (14%)	28,224 (14%)
2	83 mgd (93,000 AFY) (by 2035)	Central Area	24,180 (36%)	53,940 (36%)	78,120 (36%)

3. Describe the potential for the project to make water available to address a specific concern. Explain the specific concern and its severity. Also explain the role of the project being investigated in addressing that concern and the extent to which the project will address it. Specific concerns may include, but are not limited to:

- Water supply shortages
- Water supply reliability
- Groundwater depletion
- Water quality issues
- Natural disasters that may impact water supply infrastructure
- Heightened competition for water supplies
- Availability of alternative supplies
- Increasing cost of water supplies

Concern: Rising Population, Lack of Local Rainfall and Limited Underground Aquifers

Severity: HIGH

The City has maintained aggressive conservation efforts that have met state reductions for mandatory water use restrictions. However, the City's water service area household population is expected to increase from 1.33 million in 2020 to 1.57 million in 2045, or by 18 percent in the next 25 years, as documented in Table 2-1 of the City of San Diego's 2020 Urban Water Management Plan (UWMP).

The City has nine local surface water reservoirs with a total capacity of 549,007 AF, which are connected directly or indirectly to three water treatment plants. These reservoirs capture local rainwater and runoff to supply approximately 12 percent of the City's water. The City's reservoir system operates in combination with the imported water system. San Diego has a Mediterranean to semi-arid climate when classified using the Koppen climate classification system, which is characterized by warm, dry summers and mild winters with some rain. Local rainfall and runoff into the reservoirs store only a portion of the City's water supply. In very dry years, the local surface water from these reservoirs produces about 3,000 AFY, while in very wet years the supply can increase to 50,000 AFY. This represents a low quantity of rainfall supplies with high variability.

Groundwater storage will vary with rainfall, as that is the primary groundwater recharge mechanism. Because the forecasted groundwater supply is small compared to storage available, it is assumed to be constant in the reliability analysis (see Table 4-2).

Concern: Increasing cost of water supplies

Severity: HIGH

As described earlier in this document, most of the City's water is purchased from the SDCWA, which purchases a large portion of that water from MWD. From 2007 to 2013, MWD experienced a 12 percent annual average increase in water rates. In the future, it is expected that imported water costs will continue to increase above rates of inflation. Most of the cost increase is associated with the cost for the Delta Conveyance Project and other programs MWD is expected to implement to improve reliability. As a result, SDCWA's untreated water rates are expected to double within roughly the next 20 years.

Concern: Natural disasters that may impact water supply infrastructure

Severity: HIGH

Continued drought within San Diego and the western United States threatens imported water supplies. If the drought continues, water available from the State Water Project and the Colorado River Basin will be less reliable. Governor Brown's Executive Order B-29-15 for mandatory water use restrictions required a 16% reduction for the City of San Diego in 2015. It is anticipated that mandatory water use restrictions will become the new norm.



The City's 2012 Long-Range Water Resources Plan (LRWRP) identified Climate Change Impacts to Water Supplies and Demands in which a 10,000 to 50,000 AFY shortfall in water supply in 2035 was identified as having a probability of 20% in an un-mitigated situation, as shown in Figure 4-1, below.

The LRWRP identified a Hybrid 2 approach to mitigate the risk. Hybrid 2 includes 93,000 AFY of Indirect potable reuse (The Pure Water Program) as its primary source of water supply with an additional 37,300 AFY coming from conservation and groundwater extraction. The Hybrid 2 approach reduces the shortfall in water supply to 0 AFY with a probability of 20%, as shown in Figure 4-2, below.

In addition, imported water pipelines are adjacent to and cross the San Andreas and San Jacinto Faults. A sizeable earthquake along the San Andreas Fault has the potential to sever portions of the supply system from both the State Water Project and the Colorado River, thereby disrupting San Diego's entire imported water supply.

Figure 4-1: LRWRP 2035 Climate Change Baseline

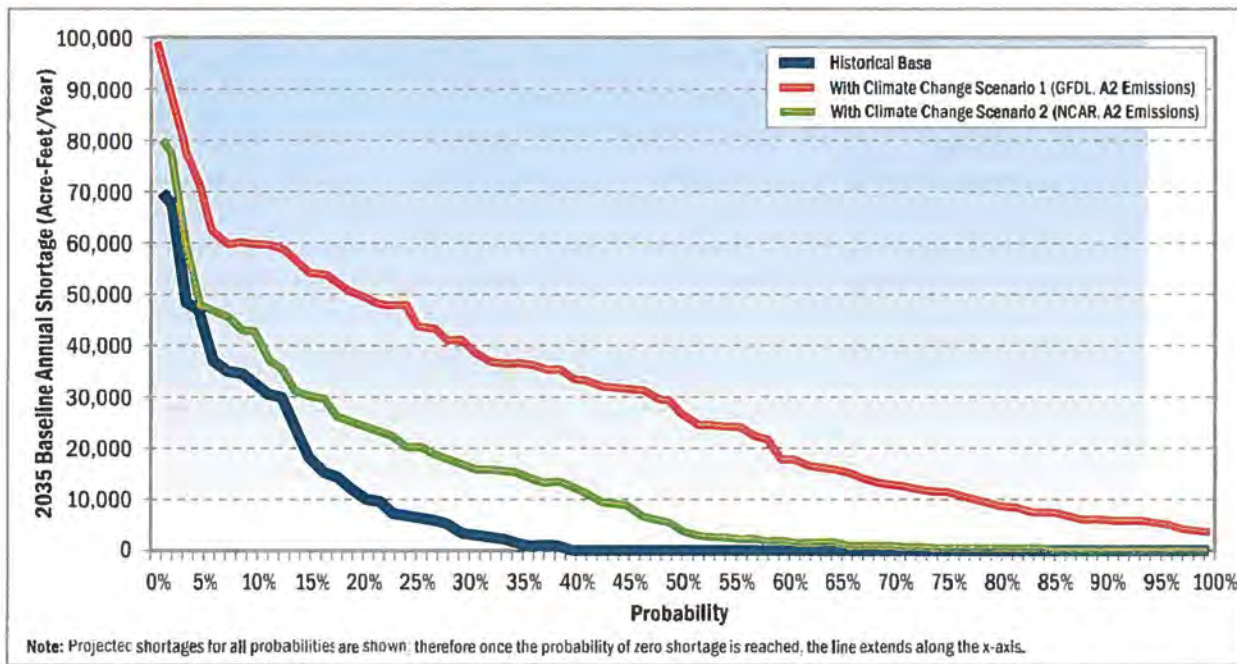
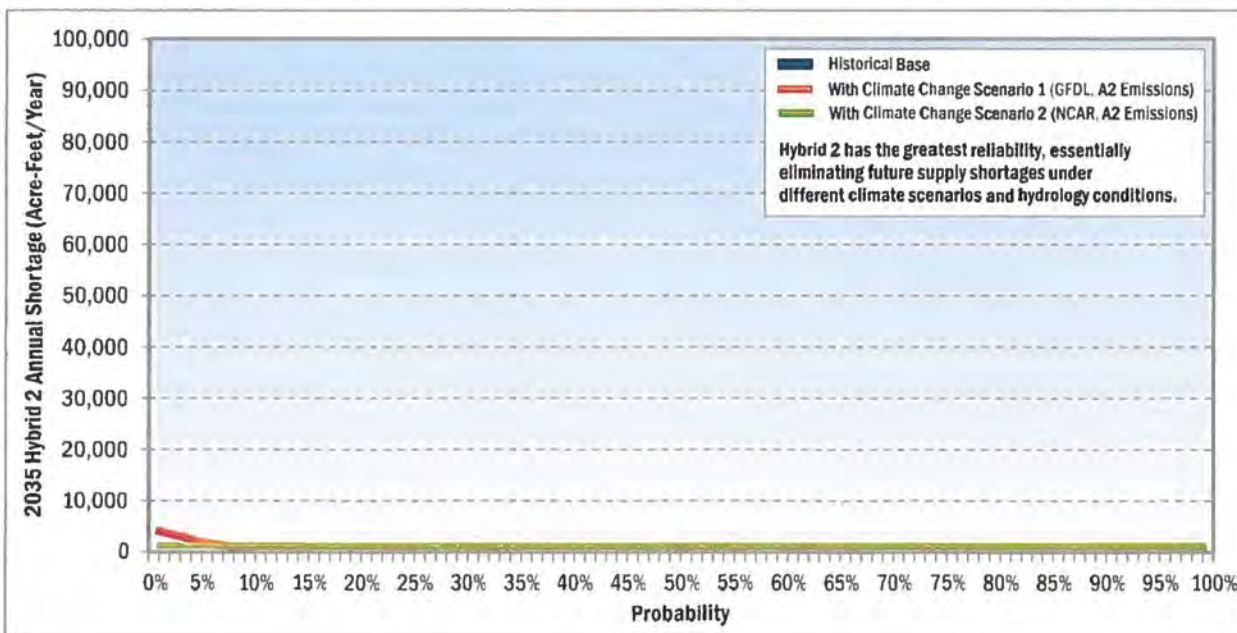


Figure 4-2: LRWRP 2035 Climate Change Hybrid 2 (Including Pure Water Program)



### The Project Helps Address Concerns

Diversification of the City's water supply will help make the San Diego region more resistant to drought and imported water delivery service interruptions. As the population continues to grow in San Diego and Southern California, the City aims to ease the heightened competition for water supplies by diversifying its water supply portfolio through the production of purified water.

The water produced by Phase 2 will be locally produced and controlled, making it a drought proof supply, as the Project aims to collect wastewater for up to 53 mgd for the central part of San Diego. The City's average demands on SDCWA is projected to decline by approximately 34% by 2045 as Pure Water Phase 2 comes online. The Project will make San Diego's water portfolio more resilient in the face of climate change and natural disasters.

The Project will utilize existing reservoirs to store the purified water. Large underground aquifers are not available in San Diego County. The effects of this new local water supply on the regional reservoir system are being analyzed in the San Diego Basin Infrastructure Study. The San Diego Basin Infrastructure Study, which is being carried out by the City and the Bureau of Reclamation, will develop structural and non-structural options within the San Diego region that can serve as adaptation strategies to manage climate change impacts, focusing on optimizing the reservoir systems and furthering the development of new water supply sources such as Pure Water. The City has also evaluated similar effects on regional wastewater infrastructure, and the potential savings are significant because the Project consists of upstream scalping facilities that reduce the load on downstream wastewater facilities.

4. Describe the potential for the project to help create additional flexibility to address drought. Will water made available by the project being investigated continue to be available during periods of drought? To what extent is the water made available by the project being investigated more drought resistant than alternative water supply options? Explain.

Yes, the purified water produced by this Project is drought proof. The reason it is drought proof is because it is not dependent upon local runoff or groundwater as the water source. The source for the purified water is recycled water; it is wastewater that has been reclaimed through water reclamation plants, re-using existing water supplies. The future Central Area Water Reclamation Plant will operate year round. There is adequate supply in the wastewater system to operate at the projected flows with the proposed diversion pump stations and achieve Phase 2's production goal of 53 mgd by 2035. In order to achieve this production rate, ~62 mgd of wastewater is needed; the lowest minimum monthly Daily Average Influent Flow measured at PLWTP was 142.5 mgd. This demonstrates that even without population growth, which would generate higher wastewater flows, Project production goals will be met.

The water made available by this Project is more drought resistant than alternative water supply options. Both imported water supplies, the Bay-Delta and the Colorado River are subject to the weather, and subsequently drought conditions.

### **E.1.3 Evaluation Criteria 3 – Environmental and Water Quality (20 points)**

1. Describe the potential for the project to improve the quality of surface water or groundwater.

#### Improved Quality of Surface Water

Through the addition of the purified water, the Project will improve the water quality of surface water reservoirs. This purified water will improve nutrient-related water quality within these reservoirs as water produced at the pure water facility is of distilled water quality and meets or exceeds all state and Federal drinking water standards. As the purified water becomes an established portion of the City's water supply, 53 mgd of Pure Water will mix with imported water providing dilution of incoming water compared to current conditions. Nutrient concentrations will be reduced as well as salinity concentrations. Improvements in salinity will reduce costs associated with drinking water treatment, infrastructure replacement, and ratepayer appliance maintenance (e.g., water heaters, fixtures).

2. Describe the potential for the project to improve effluent quality beyond levels necessary to meet State or Federal discharge requirements.

The Project will improve effluent quality to the ocean by offloading the City's 240-mgd PLWTP and reducing ocean discharges. The City is the last major municipality in the United States to operate a wastewater treatment plant with chemically enhanced primary treatment. The Federal Clean Water Act requires all wastewater treatment plants treat to the secondary treatment level. The City currently falls short of federal treatment requirements and has been operating on a modified permit since 1995. By reducing the flow to PLWTP, the discharge from the plant would be considered equivalent to secondary treatment without spending multiple billions of dollars to upgrade the plant.

Upgrading the plant to current federal standards, secondary treatment, would have a total cost of \$2.1 billion and would produce no new water. Investing in Phase 2 projects and seeking federal legislation to allow San Diego to meet modified secondary standards would eliminate the need for the costly upgrades to PLWTP while providing a needed new water supply. Full program implementation will divert 83 mgd or approximately 50% of wastewater flows to PLWTP. By diverting these wastewater flows, PLWTP can continue to meet TSS Mass Emission Permit limits of 13,598 metric tons per year—the equivalent of upgrading the plant to secondary treatment.

3. Describe the potential for the project to improve flow conditions in a natural stream channel.

Please see question #4 for combined response.

4. Describe the potential for the project to restore or enhance habitat for non-listed fish and wildlife species.

The Pure Water Program will reduce the need to import water from the Bay-Delta and Colorado River. The Project will indirectly enhance areas in the Bay-Delta and Colorado River, thus resulting in improved habitat for non-listed and listed threatened or endangered species of these regions.

The construction of dams and reservoirs has dampened the variation that was present in the historical hydrograph of the Delta and has changed the timing of flows through the Delta. Upstream diversions reduce flows into the Delta and in-Delta diversions, including State Water Project (SWP) and Central Valley Project (CVP) facilities and over 2,200 non project diversions, have reduced flow out of the Delta. Operations of the SWP/CVP facilities (including the Delta Cross Channel, Victoria Canal, and the pumping stations) have altered in-Delta hydrodynamics by altering the direction of water flow such that east to west flows are lower than they were historically, and north to south flows are greater than they were historically. In this highly altered environment, several fish species have declined to the lowest population numbers in their recorded histories. To address this decline in fish population, federal regulators have placed limits on Delta water deliveries. While environmental restrictions on water deliveries are meant to protect Delta fish species, they also reduce the operational flexibility of the SWP and CVP needed to meet statewide water supply needs (Bay-Delta Conservation Plan). A reduction in demand for this water by the City could lessen this negative impact.

A reduction in the amount of water needed from the Colorado River will help prevent loss of habitat for fish and wildlife species (LCRMSCP, 2004). The proposed Project will reduce the volume of Colorado River water diverted to San Diego and decrease these impacts.

5. Describe the potential for the project to provide water or habitat for federally listed threatened or endangered species.

Bay-Delta:

As discussed in Table 4-3, the Project will reduce the volume of water imported from the Bay-Delta by 8,736 AFY by 2025, thereby reducing impacts on the Bay-Delta. Table 4-4 describes the Federal Listed Species in the Bay-Delta:

**Table 4-4: Federal Listed Species in the Bay-Delta**

Endangered Species	Threatened Species
Chinook salmon, Sacramento River winter-run San Joaquin kit fox Riparian wood rat Salt marsh harvest mouse Riparian brush rabbit Least Bell's vireo California clapper rail Vernal pool tadpole shrimp Conservancy fairy shrimp Suisan thistle Soft bird's-beak	Chinook salmon, Central Valley spring-run Delta smelt Green sturgeon, Southern Western yellow-billed cuckoo Giant garter snake California red-legged frog California tiger salamander Central Valley Valley elderberry longhorn beetle Vernal pool fairy shrimp

Lower Colorado River:

As discussed in Table 4-3, the Project will reduce the volume of water imported from the Lower Colorado River by 19,488 AFY by 2025, thereby reducing impacts on the Lower Colorado River. Table 4-5 describes the Federal Listed Species in the Lower Colorado River:

**Table 4-5: Federal Listed Species in the Lower Colorado River**

Endangered Species	Threatened Species
Yuma clapper rail Southwestern willow flycatcher Bonytail Humpback chub Razorback sucker	Desert tortoise

## E.1.4 Evaluation Criterion 4 – Department of the Interior Priorities (15 points)

### Climate Change

- Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.

From decreasing ocean discharges to maximizing water reuse and renewable energy, the proposed projects address sustainability and environmental protection. More than 50% reduction in ocean discharges will be realized by maximizing the amount of water that is reused. Nearly one-half of the City's water supply will be produced after Phase 2 is implemented; thus, reducing reliance on imported water. In addition, renewable energy production will be leveraged to power the majority of facilities, which supports the City's Climate Action Plan targets.

- Does this proposed project strengthen water supply sustainability to increase resilience to climate change? Does the proposed project contribute to climate change resiliency in other ways not described above?

Eighty-five to ninety percent of the City's water is imported from the Colorado River and California State Water Project. This dependence on imported water and a lack of local control over its cost makes San Diego's water supply vulnerable to water shortages, droughts, climate change and natural disasters. The Pure Water Program will help solve San Diego's water challenges by enhancing the City's water supply. The Pure Water Program will also decrease the amount of treated wastewater that is released into the ocean by diverting wastewater flows away from the Point Loma Wastewater Treatment Plant (PLWWTP) and into the Pure Water system.

## Disadvantaged or Underserved Communities

- Will the proposed project serve or benefit a disadvantaged or historically underserved community? Benefits can include, but are not limited to, public health and safety by addressing water quality, new water supplies, or economic growth opportunities.

The Project will provide water throughout the city to both economically disadvantaged and non- economically disadvantaged communities. The City of San Diego is comprised of several smaller communities of which some are economically disadvantaged based on Appendix H of SANDAG's 2021 Regional Plan, adopted December 2021.

- Please describe in detail how the community is disadvantaged based on a combination of variables that may include the following:
  - Low income, high and/or persistent poverty
  - High unemployment and underemployment
  - Racial and ethnic residential segregation, particularly where the segregation stems from discrimination by government entities
  - Linguistic isolation
  - High housing cost burden and substandard housing
  - Distressed neighborhoods
  - High transportation cost burden and/or low transportation access
  - Disproportionate environmental stressor burden and high cumulative impacts
  - Limited water and sanitation access and affordability
  - Disproportionate impacts from climate change
  - High energy cost burden and low energy access
  - Jobs lost through energy transition
  - Access to healthcare

The following communities within the San Diego service area are defined as economically disadvantaged per Appendix H of SANDAG's 2021 Regional Plan.

- Barrio Logan: Seventy-five percent (75%) of the population in this neighborhood is Hispanic, 13.4% non-Hispanic White, 6.2% non-Hispanic Black, 2.4% non-Hispanic Asian, and the remainder other non-Hispanic races. Fifty-eight percent (58%) of the residents are low income with an unemployment rate of 2%. About 64% of residents are housing cost burdened. Almost 37% of the adult population did not graduate from high school, and 25.6% of the residents do not speak English well. About 7% of the population is disabled and almost 24% of households do not have access to a vehicle.
- City Heights: Fifty-four percent (54%) of the population in this neighborhood is Hispanic, 16.2% non-Hispanic Asian, 13.9% non-Hispanic White, 12.3% non-Hispanic Black, and the remainder other non-Hispanic races. Almost 59% of the residents are low income with an unemployment rate of 8.3%. About 57% are housing cost burdened. Approximately 36% of the adult population did not graduate from high school, and 19.9% of the residents do not speak English well. Eleven percent (11%) of the population is disabled and 13.7% of households do not have access to a vehicle.
- Encanto: About 51% of the population in this neighborhood is Hispanic while 21.7% are non-Hispanic Black, followed by almost 14.7% non-Hispanic Asian and 8.6% non-Hispanic White. Almost 49% are housing cost burdened. Approximately 45% are low income with a 9.6% unemployment rate. Twenty-six percent (26%) of the adults did not finish high school, and 11.0% do not speak English well. Almost 12% of the population is disabled, and 7.5% of households do not have access to a vehicle.
- Linda Vista: Thirty-nine percent (39%) of the population in this neighborhood is White while 31.5% is Hispanic and 19.8% is non-Hispanic Asian. Five percent (5%) of residents are non-Hispanic Black, and the remainder are other non-Hispanic races. Almost 39% of residents are low income, and unemployment is 7.5%. More than 45% are housing cost burdened. Sixteen percent (16%) of the adult population did not finish high school, and 9.5% of



households are isolated linguistically. Almost 9% of the population is disabled, and almost 7% of households do not have access to a vehicle.

- **San Ysidro:** Almost 91% of the population in this neighborhood (which is directly on the border with Mexico) is Hispanic. Of the remaining residents, 3.6% are non-Hispanic White, 2.3% non-Hispanic Asian, and 1.3% non-Hispanic Black, and the remainder are other non-Hispanic races. Approximately 56% of the residents are low income with an unemployment rate of 10.8%. Over 52% of households are housing cost burdened. Forty percent (40%) of those over 25 do not have a high school diploma, and 28.3% of households are isolated linguistically. Almost 11% of the population is disabled, and 10.5% of households do not have a vehicle available.
- **Skyline-Paradise Hills:** Almost 39% of the population in this neighborhood is Hispanic, while 27.7% are non-Hispanic Asian. Almost 15.4% of the population is non-Hispanic Black while 13.2% of the population is non-Hispanic White. The remainder of the population is of other non-Hispanic races. Twenty-nine percent (29%) of the population is low income with an unemployment rate of 9.1%. More than 41.5% of households are housing cost burdened. About 7.7% of households are isolated linguistically, and 19.1% of residents 25 and older did not finish high school. Almost 12% of the population is disabled, and 3.5% of households do not have access to a vehicle.
- **Southeastern San Diego:** Seventy-seven percent (77%) of the population in this neighborhood is Hispanic, while 9.4% is non-Hispanic Black. Only 7.3% of residents are non-Hispanic White, 3.5% are non-Hispanic Asian, and the remainder are other non-Hispanic races. Fifty-nine percent (59%) of the population is low income, and unemployment is 9.5%. More than 56% of households are housing cost burdened. Forty-one percent (41%) of the population 25 and older did not finish high school, and almost 19.3% of households are linguistically isolated. About 10% of the population is disabled, and about 10% of households do not have access to a vehicle.
- If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

Previous answer demonstrates factors that impact full opportunity to participate in aspects of economic, social, and civic life (e.g. unemployment rate, low income, educational attainment, English language fluency, etc.)

### **Tribal Benefits**

- Does the proposed project directly serve and/or benefit a Tribe? Will the project improve water management for an Indian Tribe?

The proposed project does not directly serve a Tribe. However, it will reduce demand for imported water from the Colorado River and the Delta Bay-Area, improving water availability within the region and all who draw water from this water supply.

- Does the proposed project support Tribal resilience to climate change and drought impacts or provide other Tribal benefits such as improved public health and safety by addressing water quality, new water supplies, or economic growth opportunities?

The proposed project supports resilience to climate change and drought impacts, as well as improved water quality, new water supplies, and economic growth opportunities to the region as a whole as previously stated in the sections. Additionally, Phase 1 of the Pure Water Program has increased economic growth, employing hundreds of local residents, and it is expected that Phase 2 will continue to support local job growth as well.

### E.1.5 Evaluation Criterion 5 – Watershed Perspective and Stakeholder Involvement (15 points)

1. Will the proposed project implement a regional or state water plan or an integrated resource management plan? Explain.

The Project benefits the region and state as a whole as it provides a safe, reliable, drought proof, locally controlled drinking water supply for the San Diego region while reducing the demand from imported water supplies. This project achieves multiple plan goals of the San Diego Integrated Regional Water Management (IRWM) Plan.

IRWM Plans are regional plans designed to improve collaboration in water resources management. The San Diego IRWM comprehensively addresses all aspects of water management and planning throughout San Diego Region. The San Diego IRWM Plans cross jurisdictional, watershed, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and addresses the issues and differing perspectives of all the entities involved through mutually beneficial solutions. The proposed Project will address the following San Diego IRWM Plan Goals: improve the reliability and sustainability of regional water supplies, protect and enhance water quality and promote and support sustainable integrated water resource management. In addition, the San Diego County Water Authority in its 2013 Regional Water Facilities Master Plan Update notes that these projects have the ability to significantly delay or forgo future Water Authority investments in new infrastructure and any decision on new regional supply development projects should take into consideration the City's potable reuse efforts.

2. Will the proposed project help meet the water supply needs of a large geographic area, region, or watershed? Explain.

The City of San Diego Public Utilities Department serves more than 1.3 million people populating more than 200 square miles of developed land. In addition, an 18% increase in household population from 2020 to 2045 is anticipated, as documented in Table 2-1 of the City of San Diego's 2020 Urban Water Management Plan (UWMP). Phase 2 will increase the local water supply to 50% of the City of San Diego's demand by 2035, reducing the need to import water from the California Bay Delta and Colorado River.

3. Will the proposed project promote collaborative partnerships to address water-related issues? Explain. Describe stakeholder involvement in the project planning process.

Yes. The City is in regular discussions with the state regulators to review project concepts for a Central Area Project. Depending on the receiving reservoir, the Central Area Project would either be implemented under the existing Indirect Potable Reuse regulations [as in Phase 1 North City Project], or under the Direct Potable Reuse regulations currently being finalized by the State Water Resources Control Board. In addition, the City continues to engage an Independent Advisory Panel comprised of industry-leading experts in scientific, engineering and public health fields to assist in the review of the Phase 2 project concepts. Depending on the direction for the reservoir selection that will be taken for Phase 2, the Panel will continue to provide important insights into how the City might implement a Direct Potable Reuse project that is fully protective of public health. The Panel's input is helpful in discussions with regulators.

The Pure Water team continues to hold meetings with the State Division of Drinking Water and the Regional Water Resources Control Board staff every two months to review deliverables that satisfy permit conditions for Pure Water and to review concepts prepared by the Pure Water team for Phase 2 Central Area. The City has also continued to work with its stakeholders, namely the Water Reliability Coalition which includes environmental organizations, the business community, and others, to garner support for the project and its efforts. Below is a list of Pure Water Supporters:



## List of Supporters

Asian Business Association	San Diego Audubon Society
Asian Pacific American Coalition	San Diego Business Leadership Alliance
BIOCOM	San Diego Coastkeeper
Building Industry Association of San Diego County	San Diego Apartment Association
California Restaurant Association, San Diego County	San Diego County Water Authority
City of Imperial Beach	San Diego Port Tenants Association
Coastal Environmental Rights Foundation	San Diego Regional Chamber of Commerce
CONNECT	San Diego Regional Economic Development Corporation
CP Kelco	San Diego River Park Foundation
Equinox Center	Southeastern San Diego Planning Group
Great Skyline Hills Community Association	Surfrider Foundation, San Diego County Chapter
Groundwork San Diego	WaterReuse Association, San Diego Chapter
Industrial Environmental Association	
Metro Wastewater Joint Powers Authority	

4. Will the proposed project include public outreach and opportunities for the public to learn about the project? Explain.

Extensive public outreach and opportunities for the public to learn about the project has been a central goal of the Pure Water Program. The City conducts a major outreach program to keep the public informed through regular presentations, meetings and social media posts for the Pure Water Program. The Pure Water website includes interactive maps that allow residents to see regularly updated construction schedules and how they will affect their areas for Phase 1. The website also has a virtual tour video of the Pure Water Demonstration Project that shows viewers a step-by-step description of how the system works. Public outreach will continue for Phase 2, as the City has given over 950 community presentations, and more recently, special tours have been given to industry members in specialty fields, representatives from the USEPA, State Water Quality Control Board and San Diego Regional Water Quality Control Board. In addition, over 949 community presentations, 285 community events and 96 educational groups and classroom presentations have been given for the Pure Water Program to connect with residents and stakeholders face-to-face to answer questions and discuss how Pure Water will help to solve San Diego's water supply challenges. The link to additional information may be found here: <https://www.sandiego.gov/public-utilities/sustainability/pure-water-sd>.



## Chapter 5 Project Budget

### Funding Plan

The non-Federal cost share will be provided by the City monetarily and supported by the water and wastewater revenues. The City is actively pursuing additional funding sources for the Phase 2 Project and the overall Pure Water Program as funding opportunities become available.

### Budget Proposal

**Table 1.—Summary of Non-Federal and Federal funding sources**

Funding sources	Amount
<b>Non-Federal entities</b>	
1. City of San Diego Water and Wastewater Revenues	\$2,250,000
2.	
3.	
<b>Non-Federal subtotal</b>	\$2,250,000
<b>REQUESTED Reclamation funding</b>	\$750,000

**Table 2.—Total project cost table**

Source	Amount
Costs to be reimbursed with the requested Federal funding	\$750,000
Costs to be paid by the applicant	\$2,250,000
Value of third-party contributions	\$
<b>TOTAL project cost</b>	<b>\$3,000,000</b>

### Budget Narrative

#### Contractual

The City is in the process of hiring a consultant team to work on the planning work for Pure Water Phase 2. The estimation is based on similar studies done for Phase 1 of the Pure Water Program taking into account rising salaries since then and the size of this project being twice as large. The consultant will provide and conduct pre-planning, technical assessments, and planning activities.

Summary			
6. Budget Object Category	Total Cost	Federal Estimated Amount	Non-Federal Estimated Amount
a. Personnel	\$0		
b. Fringe Benefits	\$0		
c. Travel	\$0		
d. Equipment			
e. Supplies	\$0		
f. Contractual	\$3,000,000		
g. Construction	\$0		
h. Other Direct Costs	\$0		
i. Total Direct Costs	\$3,000,000		
i. Indirect Charges	\$0		
<b>Total Costs</b>	<b>\$3,000,000</b>	<b>\$750,000</b>	<b>\$2,250,000</b>
<b>Cost Share Percentage</b>		<b>25%</b>	<b>75%</b>

Contractor Name	Purpose and Contracting Method	Total Cost	Description of costs	Basis of cost
TBD	Pre-planning, technical assessments and planning activities.	\$3,000,000	Personnel costs	Estimation made based on similar studies done for a previous phase taking into account rising salaries since then and the size of this project being twice as large.
<b>Subtotal</b>		<b>\$3,000,000</b>		

## Chapter 6 Environmental and Cultural Resources Compliance

The Pure Water San Diego Phase 2 Program is currently in the planning stage of development. We are applying for funds to support pre-project planning and design work which will not have any impacts to the surrounding environment.

There are no known environmental or cultural resource concerns at this time. During pre-design, any geotechnical investigation or soil disturbance that may be required will have the appropriate CEQA and NEPA review and approvals completed prior to any disturbance.

## Chapter 7 Letters of Support

Letters of Support will be available upon request.

## Chapter 8 Uniform Audit Reporting Statement

The City submitted a Single Audit report last fiscal year to the Federal Audit Clearinghouse. The Unique Entity Identifier (UEI) associated with the report is E7CWVQKE29B7.