

Title and Summary Page

Small-Scale Water Efficiency Projects for Fiscal Year 2017

1-Project Title: Apparent Water Loss Analytics Project

2-Applicant Information:

Organization:

City of Riverside
Public Utilities department
3750 University Avenue 3rd Floor
Riverside, CA 92501

Contact:

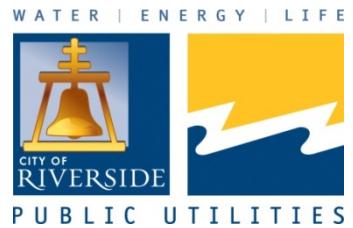
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3- Funding Requested: \$74,332

4- Total Project Cost: \$148,665

5-Project Period:

July 2017-July 2019



Proposal Contents

Proposal Contents	ii
<i>List of Tables</i>	<i>iii</i>
<i>List of Figures</i>	<i>iii</i>
<i>List of Acronyms</i>	Error! Bookmark not defined.
Section 1: Technical Proposal and Evaluation Criteria	Error! Bookmark not defined.
1.1 Executive Summary	Error! Bookmark not defined.
1.2 Background Data	2
1.2.1 Description of Applicant	2
1.2.2 Water Supplies and Demand	2
1.2.3 Water Supply Reliability (Potential Shortfalls in Supply)	3
1.2.4 Water Delivery Systems	4
1.2.5 Water Rights	4
1.2.6 Energy Efficiency Elements	5
1.2.7 Past Working Relationship with Reclamation	5
1.3 Technical Project Description	5
1.3.1 Project Need	5
1.3.2 Project Description, Activities and Implementation Schedule	7
1.3.3 Project Tasks	7
1.4 Evaluation Criteria	9
1.4.1 Evaluation Criterion A: Planning Efforts Supporting the Project	9
1.4.2 Evaluation Criterion B: Project Benefits	10
1.4.3 Evaluation Criterion C: Project Implementation	10
1.4.4 Evaluation Criterion D: Connection to Reclamation Project Activities ..	11
Section 2: Environmental and Cultural Resources Compliance	12
Section 3: Official Resolution	14
Section 4: Required Permits and Approvals	14

List of Tables

1	Water Supplies - Projected.....	2
2	Water Demand - Projected.....	3
3	RPU's Total Water Right and Base Period Production.....	4
4	Project Implementation Schedule.....	11
5	In-Kind Contribution.....	14
6	Consultant Fees.....	15

List of Figures

1	Riverside Public Utilities Water Audit for 2014-2015 Fiscal Year.....	6
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List of Acronyms

AF	Acre-feet
AFY	Acre-feet per year
AMI	Automated Metering Infrastructure
AWWA	American Water Works Association
CEQA	California Environmental Quality Act
CIS	Customer Information System
CVP	Central Valley Project
Delta	Sacramento-San Joaquin Delta
DMM	Demand Management Measures
DWR	Department of Water Resources
MWD	Metropolitan Water District of Southern California
NEPA	National Environmental Policy Act
Project	Apparent Water Loss Analytics Project
Reclamation	Bureau of Reclamation
RFP	Request for Proposal
RPU	Riverside Public Utilities
SWP	State Water Project
UWMP	Urban Water Management Plan
WMWD	Western Municipal Water District

SECTION 1 – Technical Proposal and Evaluation Criteria

1.1 Executive Summary

Date: March 28, 2017
Applicant: Riverside Public Utilities
Applicant City, County, State: City of Riverside, Riverside County, California
Project Name: Apparent Water Loss Analytics

Riverside Public Utilities (RPU) is seeking grant funding for the Apparent Water Loss Analytics Project (Project) to assist in identifying losses caused by meter decay and resulting inaccurate water meter measurement and recording. The proposed project will integrate advanced data analytics across the entire municipal meter fleet (65,000 metered connections both residential and commercial) to better understand the overall health of the agency's metering system. More specifically, utilizing data (no hardware or sensors to be installed) from existing meters and CIS systems, the project will identify specific under-registering meters and quantify both volumetric water loss and associated revenue impacts. RPU will use this data to recover revenue, improve management tools and dashboards, increase operational efficiency and workflow management, and provide insight and direction to existing meter replacement programs administered by RPU. Additionally, the Project will increase water-use efficiency, support overall conservation, and help with SB 555 compliance. Further, as RPU considers AMI deployment, The Apparent Water Loss Analytics Project will establish baseline data to be used as a control group to determine the marginal benefit of AMI implementation in RPU's service area. The tools and databases developed by this project will provide an analysis of the current state of RPU's meter system. And, going forward, these analytics will provide continued and ongoing monitoring and optimization of meter replacement schedules to maximize revenue recovery and minimize water loss.

As metering and CIS data is already being collected, the proposed Apparent Water Loss Analytics Project can be completed within two years of the grant award.

No portion of this project is located on a Federal facility.

1.2 Background Data

1.2.1 Description of Applicant

Established in 1895, Riverside Public Utilities is a consumer-owned water and electric utility that provides high quality, reliable services to a population of more than 300,000 in and around the City of Riverside, CA. RPU maintains local water resources that allow us to meet our customers' demands while being 100% independent from imported water sources.

1.2.2 Water Supplies and Demand

Supply:

RPU's water supply consists primarily of groundwater from the Bunker Hill Basin, Riverside North, and Riverside South sub-basins. Additional sources of water available to RPU include groundwater from the Rialto-Colton Basin, recycled water from the Riverside Water Quality Control Plant (RWQCP), and imported water from WMWD through a connection at the Metropolitan Water District of Southern California's (MWD) Henry J. Mills Treatment Plant (Mills WTP).

RPU has the ability to purchase State Water Project water from Western Municipal Water District (WMWD) through a connection at the Metropolitan Water District of Southern California (MWD) Henry J. Mills Water Treatment Plant (WTP). Up to 30 cubic feet per second (cfs) or 19.4 million gallons per day (mgd) of imported water can be purchased from WMD through an existing agreement and conveyed through existing infrastructure.

RPU has a total of 201 wells, of which 50 are potable wells; 14 are non-potable wells; 85 are monitoring wells; and 50 are not active (i.e., standby, out of service, abandoned, destroyed or unknown).

Table 1. Water Supplies – Projected

Water Supply	Additional Detail on Water Supply	2020	2025	2030	2035	2040
Groundwater	Existing Water Rights	85,773	85,773	85,773	85,773	85,773
Groundwater	New Projects	3,000	8,000	10,800	10,800	10,800
Recycled water	RWQCP	6,430	6,430	6,430	6,430	6,430
Purchased or Imported Water	From WMWD	21,700	21,700	21,700	21,700	21,700
	Total	116,903	121,903	124,703	124,703	124,703

Demands:

RPU's total water demands were approximately 75,000 acre-feet in 2015. This amount includes potable water, raw water for non-potable uses, and recycled water. It includes water delivered to RPU's retail customers, as well as water delivered to other agencies. Retail water deliveries include potable and recycled water sales to retail customers

within the RPU service area. Wholesale deliveries include potable and non-potable water sales to other water retailers. RPU wholesales potable water to Western Municipal Water District (WMWD). RPU wholesales non-potable water to WMWD. RPU exchanges potable and non-potable water to the Gage Canal Company (GCC) at the lower connection to the Gage Canal. Additional water uses include nonrevenue water, including system losses.

Table 2. Water Demand- Projected

Use Type	Level of Treatment	2020	2025	2030	2035	2040
Retail	Drinking Water	61,678	62,894	65,191	67,573	70,045
Retail	Raw Water	14,200	14,200	14,200	14,200	14,200
wholesale	Drinking Water	4,300	4,300	4,300	4,300	4,300
wholesale	Raw Water	2,500	2,500	2,500	2,500	2,500
Potable Water Loss	Drinking Water	5,278	5,375	5,559	5,750	5,948
Irrigation Water Loss	Raw Water	835	835	835	835	835
Total		88,791	90,104	92,585	95,158	97,828

1.2.3 Water Supply Reliability (Potential Shortfalls in Supply)

Local groundwater supplies account for most of RPU's water supplies, with approximately 60 percent originating from the Bunker Hill Basin, which is adjudicated. RPU's water rights are based on the long-term safe yield from the Bunker Hill Basin, which includes wet, dry, and normal periods. RPU's wells are generally located in the section of the basin with the greatest thickness of water bearing layers. Thus, RPU's water supply from the Bunker Hill Basin is considered reliable during single and multi-year dry periods. In addition to water supply shortages caused by drought conditions, there are other major hazards that can degrade the quality and/or impact the quantity of water available to the RPU water system. These include: regional power outages, earthquakes, liquefaction (i.e. high groundwater levels that could compromise water delivery infrastructure), floods, chemical spills, groundwater contamination, and terrorist acts. Some of these hazards could also adversely impact the distribution systems, such as the major transmission mains or reservoirs. Interruptions to water supplies from any of the above mentioned hazards may be limited to days or even months, except for groundwater contamination, which could last several years.

Riverside Public Utilities has been planning water resource management for decades. The latest Integrated Water Resource Plan ensures that RPU has an adequate water supply through 2035. It combines the use of projects that will recycle water, utilize storm water capture, and conservation to make sure we reach production and distribution projections for the next twenty five years.

RPU has implemented several measures to improve the reliability of its water system. Actions taken to prepare for a catastrophe include:

- Establishing criteria for a proclamation of water shortage
- Developing alternate sources of water supplies
- Establishing contacts and mutual aid agreements with other agencies
- Establishing an Emergency Response Team/Coordinator
- Preparing an Emergency Response Plan (ERP)
- Developing public awareness programs
- Conduct mock emergency drills at the Emergency Operations Center annually

1.2.4 Water Delivery Systems

954 Miles of pipeline, 55 active domestic wells, 41 booster stations, 15 active reservoirs, 108,500,000 (gallons) of reservoir capacity, 6 treatment plants, 14 miles of canal, 63,597,627 (gallons) daily average delivery.

1.2.5 Water Rights and Available Water Supply

As of 2013 and 2014, all of RPU's water supply came from groundwater extraction rights in the San Bernardino Basin Area (SBBA), Riverside Basin, and the Rialto-Colton Basin. These rights were established in the Western Municipal Water District of Riverside County et al., vs. East San Bernardino County Water District et al., Riverside County Superior Court Case No. 78426 (Western San Bernardino Judgment). The Western-San Bernardino Judgment cooperatively works with the 1969 Orange County Judgment to enforce the physical solution. As a plaintiff party to the Western-San Bernardino Judgment, RPU's total water right and base period production from all these basins is 85,774 AF as shown in Table 1.

Table 3. RPU's Total Water Right and Base Period Production (in acre-feet)

Groundwater Basin	RPU Right
SBBA	55,264
Rialto-Colton	2,728
Riverside North	10,902
Riverside South	16,880
Total	85,774

In addition to its groundwater production rights established in the Western-San Bernardino Judgment, RPU also has access to imported water from Western Municipal Water District (WMWD); through a connection at the Metropolitan Water District of Southern California's Henry J. Mills Treatment Plant for 21,700 acre-feet.

1.2.6 Past Working Relationship with Reclamation

Riverside Public Utilities has not had a past working relationship with Reclamation. If awarded grant funds from this current solicitation, this will be RPU's first direct Reclamation grant, based on current staff's history and knowledge.

1.3 Technical Project Description

1.3.1 Project Need

RPU estimates water losses each year by monitoring total water entering the distribution system and total withdrawals for retail demands, wholesale demands, or other known uses. Losses calculated in this manner include both apparent losses (due to factors such as water that is not registered as consumption because of meter error) and real losses (due to leaks in the distribution system). Based on historic data, RPU estimated future losses from the potable system as 8 percent of potable water deliveries.

For the irrigation water system, RPU estimates losses as 5 percent of raw water deliveries, based on data from recent years. The historical percentage was considerably higher, but RPU has identified and implemented operational improvements that have significantly reduced losses from this system.

RPU has performed AWWA water loss audits on the potable water distribution system for the past five fiscal years beginning in 2010-11. These audits provide an estimate of apparent water losses, real losses, and unavoidable real losses. The results of RPU's most recent audit, for fiscal year 2014-15, are shown below.

The value for fiscal year 2015 of 2,755 acre-feet represents about 5 percent of water deliveries during the year and includes both apparent losses and real losses.

Accurate identification of decaying and underperforming meters will enable RPU to streamline its current meter replacement program that is based solely on meter age. An advanced analytic study will determine where apparent water losses are occurring (and have occurred historically over a time series) so those meters can be replaced to capture lost revenue and conserve water supply. Every day that meters under register is revenue lost to RPU. Analytical techniques and methods will be used to leverage existing data that has been compiled for over a decade and utilize it to turn common data into actionable insights, such as refining RPU's existing meter replace program. Additionally, this overall system analysis will serve as a baseline to determine the marginal benefit of a future deployment of AMI compared to currently deployed meter technology.

Figure 1. Riverside Public Utilities Water Audit For 2014-2015 Fiscal Year

**AWWA Free Water Audit Software:
Reporting Worksheet**

WAS v5.0
American Water Works Association
Copyright © 2014, All Rights Reserved.

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

All volumes to be entered as: ACRE-FEET PER YEAR

To select the correct data grading for each input, determine the highest grade where the utility meets or exceeds all criteria for that grade and all grades below it.

Master Meter and Supply Error Adjustments

WATER SUPPLIED

Volume from own sources:	+	?	8	70,135.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr
Water imported:	+	?	10	0.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr
Water exported:	+	?	9	5,279.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr

WATER SUPPLIED: **64,856.000** acre-ft/yr

Enter grading in column 'E' and 'J'

Enter negative % or value for under-registration
Enter positive % or value for over-registration

AUTHORIZED CONSUMPTION

Billed metered:	+	?	10	59,265.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr
Billed unmetered:	+	?	10	0.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr
Unbilled metered:	+	?	8	2,785.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr
Unbilled unmetered:	+	?	9	51.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr

AUTHORIZED CONSUMPTION: **62,101.000** acre-ft/yr

Click here: ? for help using option buttons below

WATER LOSSES (Water Supplied - Authorized Consumption) **2,755.000** acre-ft/yr

Apparent Losses

Unauthorized consumption:	+	?	8	600.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr
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Unauthorized consumption volume entered is greater than the recommended default value

Customer metering inaccuracies:	+	?	9	155.514	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr
Systematic data handling errors:	+	?	8	150.000	acre-ft/yr	Pcnt:	+	?	8	100.000	acre-ft/yr

Apparent Losses: **905.514** acre-ft/yr

Use buttons to select percentage of water supplied
OR value

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses:	?	1,849.486	acre-ft/yr
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WATER LOSSES: **2,755.000** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER:	?	5,591.000	acre-ft/yr
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= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	+	?	8	1,000.0	miles
Number of <u>active AND inactive</u> service connections:	+	?	9	64,871	
Service connection density:	?			65	conn./mile main

Are customer meters typically located at the curbstop or property line? **Yes** (length of service line, beyond the property boundary, that is the responsibility of the utility)

Average length of customer service line: **65.0** psi

Average length of customer service line has been set to zero and a data grading score of 10 has been applied

COST DATA

Total annual cost of operating water system:	+	?	10	\$15,014.894	\$/Year
Customer retail unit cost (applied to Apparent Losses):	+	?	8	\$2.22	\$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	+	?	8	\$109.00	\$/acre-ft

Use Customer Retail Unit Cost to value real losses

WATER AUDIT DATA VALIDITY SCORE:

***** YOUR SCORE IS: 85 out of 100 *****

A weighted scale for the components of consumption and water loss is included in the calculation of the Water Audit Data Validity Score

PRIORITY AREAS FOR ATTENTION:

Based on the information provided, audit accuracy can be improved by addressing the following components:

1: Volume from own sources

2: Unbilled metered

3: Customer retail unit cost (applied to Apparent Losses)

1.3.2 Project Description, Activities and Implementation Schedule

The primary goals of this project are to:

- i) Asses the current state of RPU's meter fleet, with a focus on meter under registration;
- ii) Identify and prioritize under registering meters by revenue and water loss;
- iii) Quantify revenue impacts in the meter-to-cash process;
- iv) Quantify volumetric water loss;
- v) Increase operational efficiency and workflow management, and ultimately;
- vi) Provide quantitative insight for meter replacement programs.

Secondary benefits include the creation of a baseline data set to calculate the marginal benefit of eventual AMI deployment, ongoing monitoring of meter health, and SB555 compliance.

To achieve the above goals, RPU will integrate historical meter read data and CIS billing information and run it through a web-based data engine. The Study will provide an empirical basis for decision making so RPU can assess the current state of its meter fleet and consider RPU's ability to recover revenue, reduce non-revenue water deliveries, improve process efficiency, and resolve end-of-life meter issues. Apparent water losses, volumetric losses, and revenue impacts will be calculated historically and at least once per month going forward during the project term. Losses will be quantified at the customer level for every meter in RPU's system. Reporting will be derived from actual computational analytics and algorithms, not a simple dump of system data points. Cutting edge analytical techniques and methods will be used to leverage existing data that has been compiled for over a decade and utilize it to provide actionable insights which will recover revenue and improve RPU's existing meter replacement program. All reportable data can be refined by time period, geographic area, customer type (residential/commercial), and meter size. This information can also be used in building a business case for AMI deployment and the associated marginal benefit of AMI technology vs existing meter reads.

1.3.3 Project Tasks

Project implementation will occur based on the following tasks.

Task 1: Project Management, Administration and Reporting

Project management will be provided by appropriate agency staff to ensure successful project implementation. Activities will include project administrative oversight, managing consultants, and conducting meetings as necessary to discuss project progress.

In addition, grant administration will be performed to execute the grant agreement, ensure compliance with grant requirements, prepare and submit necessary supporting

grant documents and provide coordination with the grantee, project partners and the Reclamation grant manager.

Task 2: Vendor Procurement

This task includes the activities necessary to select a qualified vendor and secure a contract for the Apparent Water Loss Analytics Project. As contracting and formal bid reviews may still occur, RPU will only approve the use of equipment, technologies, and capabilities that are currently commercially available, have been implemented in other agencies, and have a proven history of success. A preference will be given to vendors utilizing “cloud” based solutions with interactive dashboards that can segment results by time, customer type, meter size, geographic distribution, etc.

Task 3: Analytic Interpretation of Data

This task includes the advanced investigation of existing collected data including current water meter system reporting, customer information system database, and utility billing histories. Activities implemented under this task may include the following:

- Use of advanced analytical techniques and methods to identify apparent losses
- Retroactive analysis of 10 years' worth of meter and CIS data
- Quantification of current, historical, and going forward apparent water loss (both revenue and water)
- Identification and quantification of lost revenue due to meter under registration, decay, and inaccuracy
- Establishment of baseline data to determine benefits of future AMI deployment
- Active comparison of apparent losses pre & post AMI deployment (should AMI be deployed during project term)
- Staff training
- Community outreach
- Data management

Task 4: Informed Actions

- Staff Training
- Modifications to existing meter replacement program
- Deployment of AMI infrastructure

- Correction of identified apparent water losses
- Enhanced regulatory compliance

Task 5: Deliverables

The final deliverable for the project will be a consulting report which:

- Assesses the current state of RPU's meter fleet
- Identifies specific decaying meters at the customer level
- Quantifies volumetric water loss at the meter level
- Quantifies revenue loss at the meter level
- Recommends meter replacement program improvement and meter-to-cash optimization
- Describes analytical techniques and algorithms utilized

1.4 Evaluation Criteria

Descriptive narratives addressing how the proposed project meets grant criteria are provided in the following subsections. The evaluation criteria, as described in the Funding Opportunity Announcement, are presented first in *italics*, followed by specific information on the proposed project.

1.4.1 Evaluation Criterion A: Planning Efforts Supporting the Project

Does the proposed project implement a goal or address a need or problem identified in the existing planning effort?

RPU submitted the 2015 Urban Water Management Plans (UWMPs) to DWR, in compliance with the Urban Water Management Planning Act in California Water Code. Each agency updates its UWMP every five years. The 2015 UWMP guidelines require a specific set of demand management measures (DMMs) to be reported on in the 2015 UWMPs, including Water Waste Prevention Ordinances, Metering, Conservation Pricing, Public Education and Outreach, **Programs to Assess and Manage Distribution System Real Loss**, and Water Conservation Program Coordination and Staffing Support.

The UWMP section on DMMs describes how each DMM is being implemented. Further, the UWMPs lay out agency goals for reducing or maintaining per capita water use to comply with water use targets required by the California Water Conservation Act of 2009, SBx7-7. This project is among the measures needed for optimizing water use efficiency.

Links to RPU's 2015 UWMP is provided below:

Explain how the proposed project has been determined as a priority in the existing planning effort as opposed to other potential projects/measures.

The 2015 RPU's UWMP objectives include conserving water through water use efficiency and conservation measures. The Project will increase water use efficiency and reduce loss of potable supplies. This reduction in potable water demands will contribute in meeting SBX7-7 GPCD compliance targets and improve local water security by reducing dependence on imported water.

1.4.2 Evaluation Criterion B: Project Benefits

The expected project benefits to RPU's water resources, planning, and water supply delivery systems are the following:

- 1- Reduction of water loss and GPCD
- 2- Informing meter replacement programs
- 3- Identification and recovery of revenue (est. between 1% and 5% of top line revenue)
- 4- Improving operational efficiency and workflow planning and management
- 5- Improving conservation efforts
- 6- Monitoring ongoing meter health
- 7- Aiding in regulatory compliance (SB555, EO 37-16) with the validated water loss audit submittal

1.4.3 Evaluation Criterion C: Project Implementation

Implementation Schedule

Due to already completed and ongoing planning work conducted by RPU, implementation of the Apparent Water Loss Analytic project would begin on receipt of funding. Based on the Funding Opportunity Announcement, award notification may be given by May 31, 2017 and financial agreements finalized within one to four months thereafter. Funds are expected to be awarded no later than September 30, 2017, contingent on appropriations. For planning purposes, it is assumed that project implementation would begin by August 1, 2017. It is expected that funds will be awarded no later than September 30, 2017, contingent on appropriations.

The project will be completed by September 30, 2018, or within 2 years of project award, however full implementation is anticipated to occur sooner. See schedule of project activities below.

Table 4. Project Implementation Schedule

Month	1	2	3	4	5	6	7	8	9	10	11	12
Kickoff	x											
Provide Data	x											
Data Transfer		x										
Run Analytics			x	x								
Deliver Beta Results					x							
Deliver Refined Results						x						
Deliver Final Consulting Report							x					
Validate Identified Meters*								x	x	x	x	
Project Completion												x

*Meter validation will be RPU's responsibility. Valor will work closely with RPU to develop program, protocol, etc.

No permits will be needed for implementation of the proposed project. Project work will be conducted at existing meter locations and on RPU property.

No engineering or design work is needed to support the proposed project.

No new policies or administrative actions are required to implement the proposed project.

1.4.4 Evaluation Criterion D: Connection to Reclamation Project Activities

1. *How is the proposed project connected to Reclamation project activities?*

The proposed project is connected to Reclamation project activities, because it benefits the same Delta region as the Central Valley Project (CVP), a federal project, managed by Reclamation, and the largest surface water storage/delivery system in California. The applicant, RPU, can receive up to 21,700 AF of imported water from the SWP. The Water Loss Analytics project will help reduce RPU's need to tap into imported water sources, which in turn are closely connected to the CVP. The SWP and CVP each draw water from the Delta, where the Sacramento and San Joaquin Rivers meet, and the two projects share responsibility for in-basin use as well as for sharing surplus flows.

2. *Does the applicant receive Reclamation project water?*

The Applicant, RPU, does not receive Reclamation project water. RPU's sole water source is local groundwater right.

3. Is the project on Reclamation project lands or involving Reclamation facilities?

No, the Project is neither on Reclamation lands nor does it involve Reclamation facilities

4. Is the project in the same basin as a Reclamation project or activity?

No, the Project is not located in the same basin as a Reclamation project or activity.

5. Will the proposed work contribute water to a basin where a Reclamation project is located?

Yes, the Project will help reduce water demands locally which would keep RPU water independent from SWP water imports from the Sacramento-San Joaquin Delta. Multiple Reclamation projects are located within the Delta watershed and often closely interlinked with the SWP system, such as the CVP. By reducing the amount of water imported, this water remains in the Delta watershed, thereby also benefitting Reclamation projects.

6. Will the project help Reclamation meet trust responsibilities to Tribes?

The project may help Reclamation meet trust responsibilities to Tribes to the extent that by reducing demands on SWP imports the project will help improve conditions on water resources that could benefit Reclamation projects.

SECTION 2 –Environmental and Cultural Resources Compliance

(1) Will the project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.

The proposed project will consist of analyzing meter performance using advanced analytics and may require replacing some existing meters, which will not result in earth-disturbing work. As a result, the proposed project will not impact the surrounding environment.

(2) Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?

The proposed project will not impact sensitive species or their habitat.

(3) Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “waters of the United States?” If so, please describe and estimate any impacts the project may have.

No.

(4) When was the water delivery system constructed?

The City of Riverside water delivery system was constructed initially for irrigation purpose in early 1874. By 1959 and due to urbanization, most of the delivery system has been shifted for to domestic, municipal, and industrial application.

Average meters age is 10 years with about 65% of all 65,345 meters are older than 5 years and the rest are less than 5 years old. All of Riverside customers are metered

(5) Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.

No,

(6) Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

Yes, buildings and features listed on the National Register for Historic Places are found within Riverside Public Utilities service area boundaries. However, the proposed project will not impact these sites.

(7) Are there any known archeological sites in the proposed project area?

Based on a review of the California Office of Historic Preservation list of historical resources, there are no known archaeological sites within the proposed project area. Additionally, the proposed project will occur within already developed areas and would not affect potential archeological sites.

(8) Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?

The project will not have a disproportionately high or adverse effect on low income or minority populations. In fact, the project may provide financial benefits to customers receiving upgrades through timely leak detection and water conservation and reduced water bills.

(9) Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?

No, the project will not limit access to or ceremonial use of Indian sacred sites or result in other impacts on tribal lands. The project may involve meter replacements of existing meters which would not result in adverse impacts on tribal lands.

(10) Will the project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?

No.

SECTION 3 – Official Resolution

Official Resolution will be submitted within 30 days of the application deadline.

SECTION 4 – Required Permits and Approvals

No permits will be needed for implementation of the proposed project. Project work will be conducted at existing meter locations and on RPU property.

SECTION 5 – Budget Narrative

We are asking for \$74,332 in federal funds so that we can complete our proposed project.

The city of Riverside is providing in kind matching funds to cover a portion of Task 1 costs, and vendor procurement (Task 2) to be performed in part by City staff engineer and in part by a consultant who will be the acting Program Manager. Consultant cost details are described in the following paragraph. It is anticipated that the city staff will contribute a onetime 30 hours at the beginning and on average 2 hours per month over the 12-month project period, as shown below.

Table 5. In-Kind Contribution

BUDGET ITEM DESCRIPTION	\$/hr	Hrs	Costs
Part of Task 1 and 2 (Staff Engineer)	83	54	\$4,465

City staff costs shown above are based on hourly rates. Fringe Benefits are assumed in labor rates provided in the salaries and wages and therefore are not provided separately in the overall project budget.

Contractual/Implementation work to be performed by contractors includes work related to Tasks 1 and 3 through 5 as described in Section 1.2.3 of this application. Cost estimates for contractors are based on estimates of services provided by consultant. The City of Riverside is providing \$69,868 in monetary contribution to cover the remainder of the matching fund.

Table 6. Consultant Fees

Services	Notes	Initial Term (months)	One-Time Fee (\$)	Monthly Fee (\$/meter)	Total meters	Total Meter Fee (\$)	Total Service Fee (\$)
Integration	One time	n/a	\$35,000	\$0.000	65,000	\$0	\$35,000
Meter Analytics	One year	12	\$0	\$0.140	65,000	\$109,200	\$109,200
Project Management	Included	12	\$0	\$0.000	65,000	\$0	\$0
Project Report Delivery	Included	n/a	\$0	\$0.000	65,000	\$0	\$0
Consultant Project Fees	Year 1		\$35,000			\$109,200	\$144,200

Notes: Integration fee includes all data cleaning, import, ingestion, etc.
 Meter analytics is on a per meter basis assuming a one year term
 Standard project management and program fees are included
 Consulting and training of RPU staff is included
 Final project report and delivery is included
 Support during the meter validation phase is included

No environmental and regulatory compliance, other, and indirect costs are anticipated for this project.

Total Cost

The total cost of the proposed project is **\$148,665**. The City of Riverside is providing \$74,333 in funds. \$4,465 of the fund provided by the city will be in a form of in-kind contribution, and \$69,868 of the City of Riverside provided fund will be in monetary contribution to the consultant fees. The City of Riverside is requesting \$74,332 in funding from Reclamation to fund the proposed project. This represents 50% of the total project costs. No other Federal funding has been requested or received for the proposed Project.