BUREAU OF RECLAMATION

WaterSMART Grants:
Small-Scale Water Efficiency
Projects

No. R21AS00300 Proposal:

CITY of YUMA

Water Distribution System Pressure & Temperature Monitoring

City of Yuma
Utilities Department

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Executive Summary

Date: March 11, 2021
Applicant: City of Yuma, Utilities Department
City: Yuma
County: Yuma
State: Arizona

The City of Yuma is a Category A applicant. Nestled in the Yuma and Gila Valleys, the City of Yuma lies in the southeast corner of the United States' Lower Sonoran Desert on the California-Mexico-Arizona border, near the convergence of the Colorado and Gila rivers. With approximately 110,000 full time residents who live both inside and outside the City's boundaries. Yuma is the third largest metropolitan area in the State of Arizona, as well as Arizona's 11th largest city. The incorporated area of Yuma is approximately 119 square miles, lies within Yuma County, and is the county seat. *(See Map #1 - AZ)*

The Water Distribution System Pressure and Temperature Monitoring project is located within the City of Yuma's authorized water delivery area. The scope of the project will entail retrofitting 20 existing Clow Medallion fire hydrants with iHydrant™ Pressure and Temperature monitoring devices. These devices will allow for the live continuous water pressure and water temperature monitoring of the city's water distribution system. The benefits of active monitoring of the water distribution system include a better understanding of how the system operates and how changes made in one area impact another area. Currently this data can only be obtained by temporarily installing monitoring devices. These devices have to be returned to the office for downloading of the captured data. The project will take approximately 8 weeks with start date of February 1, 2022 and a completion date of March 25, 2022.

The proposed project is not located on a federal facility.

Project Location

The Water Distribution System Pressure and Temperature Monitoring project is located in the City of Yuma, Yuma County, Arizona. This area is bounded by Avenue D on the west, Avenue 10E on the east, the Colorado River on the north and County 14th St on the south. The device installations are on fire hydrants spread throughout the water distribution system and not at one set location. (See Map #2 – Installation Locations)

Project Description

The Water Distribution System Pressure and Temperature Monitoring project involves the installation of an integral water pressure and water temperature monitoring device inside of select Clow Medallion fire hydrants. The project will begin by ordering 20 iHydrant™ retrofit kits and selecting the fire hydrants for the retrofit kit installation. The selected fire hydrants and their

corresponding control valve will be inspected for proper operation. This will be conducted by two Water Systems Maintenance Technicians utilizing a service truck and tools. After receipt of the retrofit kits the installations will be completed. This will be conducted by four Water Systems Maintenance Technicians utilizing two service trucks and tool. They will turn off the water supply to the fire hydrant. Disassemble the fire hydrant removing all of its internal components. Install the retrofit kit which includes new internal components and an upper housing. Enter the electronic information into the iHydrant™ webpage designated for the City of Yuma. This includes setting the parameters for the alarms and notifications. Restore the water supply to the fire hydrant which will activate the pressure and temperature monitoring device. Check the website for proper pressure and temperature displays. Attach a picture of the completed installation to the record on the website and work order. Complete the work order created for the fire hydrant.

Criterion A – Project Benefits

Describe the expected benefits and outcomes of implementing the proposed project.

The expected benefits of the iHydrant® installations is to actively monitor the water pressure and temperature within the water distribution system. The outcomes of active monitoring of the water distribution system include a better understanding of how the system operates and how changes made in one area impact another area. System alerts also allow for a rapid response to sudden changes outside of established parameters in the system that could impact customers before they have a chance to notify us. Data collected and stored will be available for use in maintaining and updating the Water Distribution System Model.

What are the benefits to the applicant's water supply delivery system?

The benefit of the Water Distribution System Pressure and Temperature Monitoring project to the City of Yuma's water supply delivery is the continuous live pressure and temperature monitoring of the water distribution system. This continuous monitoring will allow for a rapid response to sudden changes outside of established parameters in the system that could impact customers. Crews could be dispatched to respond to an area of low pressure before anyone has a chance to notify us of a potential issue.

Extent to which the proposed project improves overall water supply reliability.

The proposed project improves overall water supply reliability significantly due to the instantaneous alarm sent if water pressure or temperature strays outside of set parameters. Sudden drops in pressure could be indicators of a major water leak. Spikes in pressure can be caused by water hammer. Water hammer has the ability to cause significant damage to the water distribution system. The alarm sent will substantially speed the notification and response time to either situation.

Disinfection residuals are required to be maintained throughout the water distribution system. Water temperature affects the disinfectant residual life in the water main, an increase in

temperature causes the disinfectant to degrade and weakens its germicidal activity and thus might produce a potential health hazard. Monitoring of the temperature in multiple areas of the distribution system will aid in determining where to focus water quality flushing activities to maintain required residual levels.

The expected geographic scope benefits from the proposed project (e.g., local, sub-basin, basin)

The geographic scope benefits of this project are local and are within the City of Yuma's authorized service area.

Criterion B – Planning Efforts Supporting the Project

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

The proposed project addresses the goal of providing an excellent level of service to customers as well as for emergency and other community service needs. The acceptable level of service expected from the water distribution system is defined by the adequacy and reliability of the water supply delivered to the customer. A reasonable level of service includes the provision for adequate system pressure, fire protection, and reliability of supply.

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

The proposed project has been determined as a priority in the existing City of Yuma Integrated Master Plan. System operational requirements provide for a defined level of service from the utility to the customer. Levels of service include many parameters, such as minimum and maximum pressures. Adequate pressure is typically defined in terms of a minimum pressure under certain demand conditions, such as peak hour demands or fire flow. Adequate fire protection refers to providing adequate flow to meet firefighting demands. The water system is considered to be adequate when system demand conditions are satisfied while meeting system performance criteria related to system pressure, velocity, and head loss. Low pressures in certain service areas and high pressure in other service areas were identified as a deficiency in the City of Yuma Integrated Master Plan.

Criterion C – Project Implementation

Describe the implementation plan for the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates.

Proposed Work	Major Task	Milestones	Start Date	Completion Date
Procurement	Obtain & Submit Quote	Project Start	February 1, 2022	February 21, 2022
	Order kits	Delivery	February 21, 2022	April 4, 2022
Construction	Inspect fire hydrants		February 1, 2022	February 7, 2022
	Install iHydrant™ Kits	Project installation	April 4, 2022	April 8, 2022
Close Out	Close work orders	Project Completion	April 8, 2022	April 8, 2022

Describe any permits that will be required, along with the process for obtaining such permits. N/A

This project does not require any permits.

Identify and describe any engineering or design work performed specifically in support of the proposed project. N/A

No engineering or design work will be performed for this proposed project.

Describe any new policies or administrative actions required to implement the project. N/A

There are no new policies or administrative actions required to implement this project.

Describe the timeline for completion of environmental and cultural resource compliance. Was the timeline for completion of environmental and cultural resource compliance discussed with the local Reclamation office? N/A

There are no environmental or cultural resource compliance items required for this proposed project.

FUNDING PLAN

The City operates on a fiscal year budget cycle. Funds for the iHydrant™ retrofit kits are included in FY22's budget. Budget preparation for FY 2022 (July 2021 – June 2022) has been prepared and $55,600 has been earmarked for materials identified specifically for iHydrant™ retrofitting (*budget pending City Council approval*). Experienced staff are assigned to the project. The City of Yuma is committed to the funding of this distribution system monitoring program regardless of the Grant status. The City of Yuma may fund and install additional devices in subsequent budget years. The City of Yuma will continue to budget the annual subscription and maintenance fee. All funds are from the City of Yuma Utility Enterprise Fund. No outside source will provide funds as a third party.

BUDGET PROPOSAL

SOURCE	Total Cost by Source
Cost to be reimbursed with requested Federal funding	$29,567.13
Costs to be paid by the applicant	$29,567.13
Value of third-party contributions	$0.00
TOTAL PROJECT COST	**$59,134.26**

BUDGET ITEM DESCRIPTION	COMPUTATION			
	$/Unit	Unit	Qty	COST
SALARIES & WAGES Full-Time Employees				
Water Systems Manager	$34.04	Hour	6	$204.20
Water Systems Maintenance Technician	$16.87	Hour	30	$506.10
Water Systems Maintenance Technician	$17.55	Hour	30	$526.50
Water Systems Maintenance Technician	$17.55	Hour	10	$175.50
Water Systems Maintenance Technician	$22.93	Hour	10	$229.30
FRINGE BENEFITS Full-Time Employees				
Water Systems Supervisor	$10.21	Hour	6	$61.26
Water Systems Maintenance Technician	$5.06	Hour	30	$151.80
Water Systems Maintenance Technician	$5.27	Hour	30	$158.10
Water Systems Maintenance Technician	$5.27	Hour	10	$52.70
Water Systems Maintenance Technician	$6.88	Hour	10	$68.80
TRAVEL	N/A	N/A	N/A	N/A
EQUIPMENT				
44216760 Service Truck	$35.00	Hour	30	$1,050.00
44217403 Service Truck	$35.00	Hour	10	$350.00
SUPPLIES/MATERIALS				
iHydrant Retrofit Kits	$2,780.00	Each	20	$55,600.00
CONTRACTUAL/CONSULTANT	N/A	N/A	N/A	
ENVIRONMENTAL AND REGULATORY COMPLIANCE	N/A	N/A	N/A	

OTHER	N/A	N/A	N/A	
TOTAL DIRECT COSTS				$59,134.26
INDIRECT COSTS - __%	N/A	N/A	N/A	0.00
TOTAL PROJECT COSTS				**$59,134.26**

BUDGET NARRATIVE

A. Salaries and Wages/Personnel

Name/Position	Computation	Cost
Alberto Barcenas, Water Systems Supervisor	6 hrs. x $34.04	$204.20
Cristian Contreras Water Systems Maintenance Technician	30 hrs. x $16.87	$506.10
Raul Razo Water Systems Maintenance Technician	30 hrs. x $17.55	$526.50
Isaac Rather Water Systems Maintenance Technician	10 hrs. x $17.55	$175.50
Randy Garcia Water Systems Maintenance Technician	10 hrs. x $22.93	$229.30
	TOTAL WAGES	**$1,641.60**

Explanation of Work: This covers full time personnel participating in the funded project: the Water Systems Supervisor (*Project Manager*), and four Water Systems Maintenance Technicians. Hours worked cover from the possible start date of 02/01/2022 and include all work associated with the project to the possible end date of 06/30/2022.

Work tasks:

Prepare Material Order – Obtain current material cost estimate from supplier. Submit estimate for the preparation of a Purchase Order. Once Purchase Order received order materials.

Await Delivery – While awaiting delivery of materials. Prepare work orders for inspection of fire hydrant assets that will be retrofitted.

Materials Delivered – After delivery of materials. Prepare work orders for the installation of the retrofit kits.

Retrofitting Roll Out – Proceed to each designated fire hydrant location; turn off the water supply to the fire hydrant. Remove the bonnet, upper stem, lower stem and main valve assembly. Install new iHydrant™ main valve assembly, upper stem, lower stem, flange assembly and shroud. Activate monitoring device on the iHydrant™ website.

Process Completed – Document all work performed on the work order, include manpower and equipment, take a picture of the installation and attach it to the work order. Change work order status to Closed In Field.

Project Tracking – Verify all retrofit kits were installed on the fire hydrants. Process Purchase Order invoice for payment upon receipt.

B. Fringe Benefits

Name/Position	Computation	Cost
Alberto Barcenas, Water Systems Supervisor	6 hrs. x $10.21	$61.26
Cristian Contreras Water Systems Maintenance Technician	30 hrs. x $ 5.06	$151.80
Raul Razo Water Systems Maintenance Technician	30 hrs. x $ 5.27	$158.10
Isaac Rather Water Systems Maintenance Technician	10 hrs. x $ 5.27	$52.70
Randy Garcia Water Systems Maintenance Technician	10 hrs. x $ 6.88	$68.80
	TOTAL BENEFITS	**$492.66**

Explanation of Benefits: Fringe Benefits are calculated at approximately 30% of the hourly wages for each position. They include Employer's FICA, Pension, Health Insurance, Workman's Compensation, and Unemployment Compensation. Actual Fringe Benefits are based upon each employee's actual hourly wages.

C. Travel

Purpose of Travel	Location	Item	Computation	Cost
No outside travel allowed or necessary.				

D. Equipment

Item	Computation	Cost
44216760 Service Truck	$35.00 / hr. x 30 hrs.	$1050
44217403 Service Truck	$35.00 / hr. x 10 hrs.	$ 350
		$1,400.00

Explanation of Equipment: Equipment costs are calculated according to the hourly rate of each vehicle, following general accounting methods. This is standard policy for City billing of vehicles. Fuel and mileage are included in the hourly flat rate. Hours are calculated according to estimated time for personnel working on all applicable field tasks for this project. The City possesses the necessary tools and equipment to conduct the work tasks.

E. Supplies

Item	Computation	Cost
iHydrant™ pressure monitoring retrofit kits	$2,780.00 x 20	$55,600.00
	TOTAL SUPPLIES	**$55,600.00**

Explanation of Supplies: This project involves retrofitting of Clow fire hydrants with the iHydrant™ pressure and temperature monitoring device. The retrofit kits are purchased from through the local Clow Distributor. All materials necessary to complete the installation are included in the retrofit kit. No additional supplies are needed.

F. Consultants/Contracts

Name of Consultant	Service Provided	Computation	Cost
N/A			0

Explanation of Consultants/Contracts: There are no outside consultants or contracts necessary for this project. City employees will conduct all retrofitting to save on contracting expenses.

G. Environmental and Regulatory Compliance Costs

Item	Cost
N/A	0

Explanation of Environmental/Regulatory Compliance: No compliance costs required.

H. Other Costs

Description	Computation	Cost
N/A		0

Explanation of Other Costs: There are no other costs related to this project.

I. Indirect Costs

N/A 0

Explanation of Indirect Costs: There are no indirect costs related to this project.

Budget Summary

Budget Category		Amount
A. Personnel		**$1,641.60**
B. Fringe Benefits		**$ 492.66**
C. Travel		**N/A**
D. Equipment		**$ 1,400.00**
E. Supplies		**$ 55,600.00**
F. Consultants/Contracts		**N/A**
G. Environmental & Regulatory Costs		**N/A**
H. Other		**N/A**
	Total Direct Costs	**$ 59,134.26**
I. Indirect Costs		**N/A**
	TOTAL PROJECT COSTS	**$ 59,134.26**

Environmental and Cultural Resource Considerations

• *Will the proposed 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.*

Response: No. There will be no soil disturbed during this project. All work is performed above ground on existing fire hydrants.

• *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?*

Response: No. The target areas are within established residential neighborhoods and will have no impact to federally recognized candidate species.

• *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 proposed project may have.*
Response: This project is not in the wetlands area and will not affect "water of the United States".

• *When was the water delivery system constructed?*
Response: The City of Yuma's water distribution system dates back to the early 1900's.

• *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.*
Response: This project will not affect any structure features of irrigation conveyance systems. It only affects existing fire hydrants in the City's water distribution system.

• *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.*
Response: There are no places listed on the National Register of Historic Places within the proposed project area.

• *Are there any known archeological sites in the proposed project area?*
Response: There are no archeological sites in the proposed project area.

• *Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?*
Response: No. The project has no direct effect on any income level or population category.

• *Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*
Response: No. This project has no impact on any sacred Indian sites or tribal lands.

• *Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?*
Response: No. The project does not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

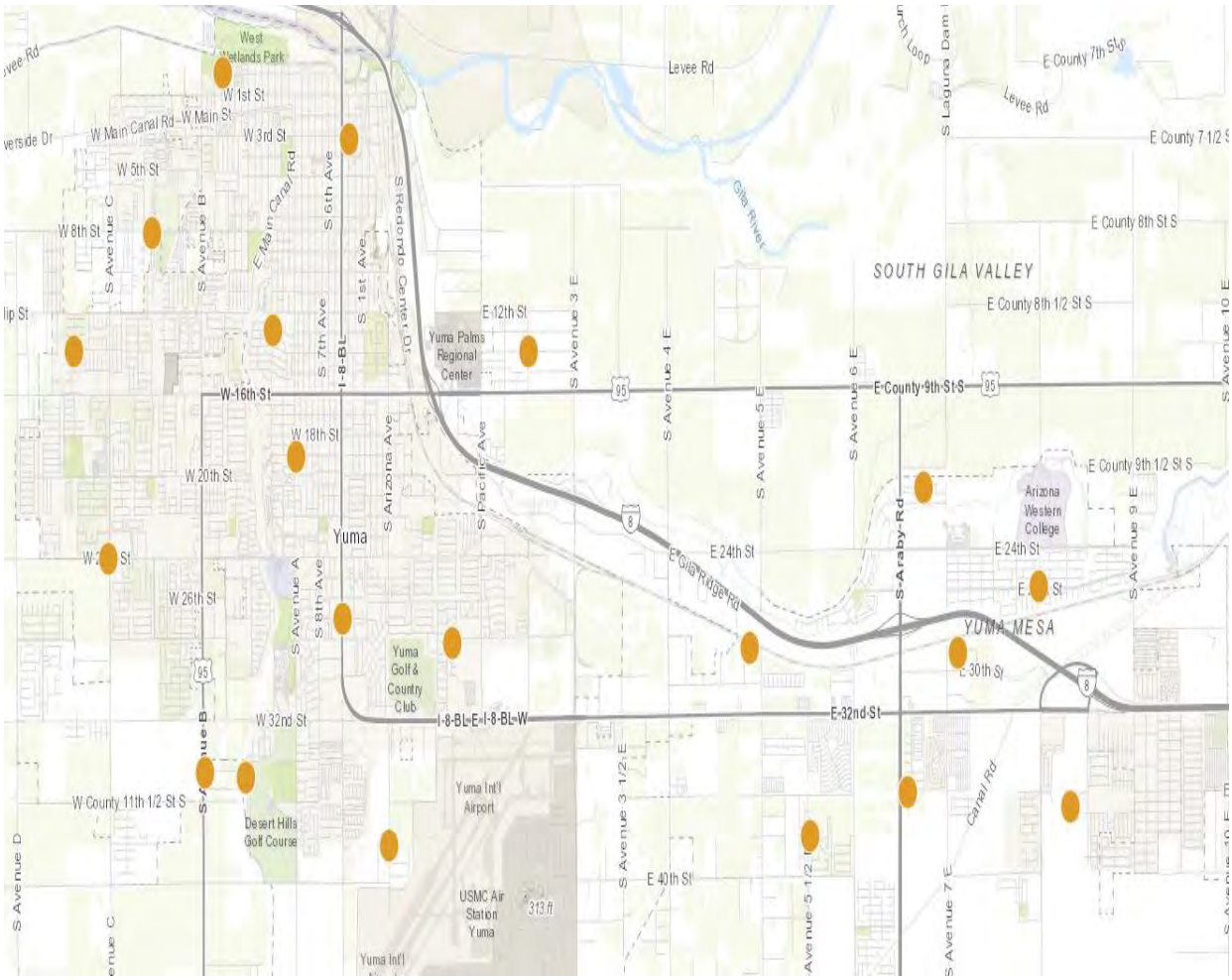
Required Permits and Approvals

There are no required permits or approvals for this project.

Official Resolution

An official resolution has been prepared to be presented to the Yuma City Council authorizing the execution of a participant agreement for a WaterSMART Grant administered by the United States Department of the Interior Bureau of Reclamation, to assure availability of local matching funds, ensuring that the City will work with Reclamation to meet established deadlines for entering into the grant and authorization to sign a participant agreement. Upon adoption, and within 30 days after the application deadline, the adopted resolution will be submitted.


City of Yuma
Map #1
N
W
E
S
MOHAVE
COCONINO
NAVAJO
APACHE
Flagstaff
YAVAPAI
LA PAZ
GILA
Phoenix
MARICOPA
GREENLEE
Yuma
YUMA
PINAL
GRAHAM
Tucson
PIMA
COCHISE
SANTA CRUZ
0 12.5 25 50 75 100 125 150 175 200 225 250 Miles



iHydrant™ Device Installation Locations

MAP # 2