

**Lower Tule River Irrigation District
Recharge Basin Metering System
Tulare County, CA**

**Application Submitted to
United States Bureau of Reclamation**

(Funding Opportunity Announcement No. BOR-DO-19-F005
Section C.3.1)

**Lower Tule River Irrigation District
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April 9, 2019

**Lower Tule River Irrigation District
Recharge Basin Metering System**

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Lower Tule River Irrigation District

Recharge Basin Metering System Technical Proposal and Evaluation Criteria

I. Executive Summary

A. General Project Information

Proposal Name: Recharge Basin Metering System

Date: April 9, 2019

Applicant Name: Lower Tule River Irrigation District

City, County, State: Tipton, Tulare County, California

B. Project Description

The Lower Tule River Irrigation District (LTRID or District) is submitting this WaterSMART grant application to seek financial assistance for its plan to install and furnish twenty-five (25) Area-Velocity Flow Meter (AVFM). The AVFM is equipped with digital encoders and transmitters that will radio meter data to a data collector. Currently, the District is using manual flow measurements to measure the water flowing into recharge basins. This AVFM installation project will result in improved water management through increased water measurement accuracy, efficiency and labor and reduce fuel consumption savings by eliminating the need to visit each recharge basins multiple times per day for manual measurements and adjustments. The grant fund would be used to purchase and install the meters with existing District staff. The installation of AVFM, which is capable of continues measurement of velocity and water level in a half pipe flow, is part of the District long term plan to provide accurate and dependable data for Sustainable Groundwater Management Act (SGMA) purposes in the future. The AVFM will provide reliable data to manage surface water for the Districts' stakeholders. This grant application is submitted pursuant to Funding Opportunity Announcement NO. BOR-DO-19-F005, Section C.3.1 Irrigation Flow Measurements.

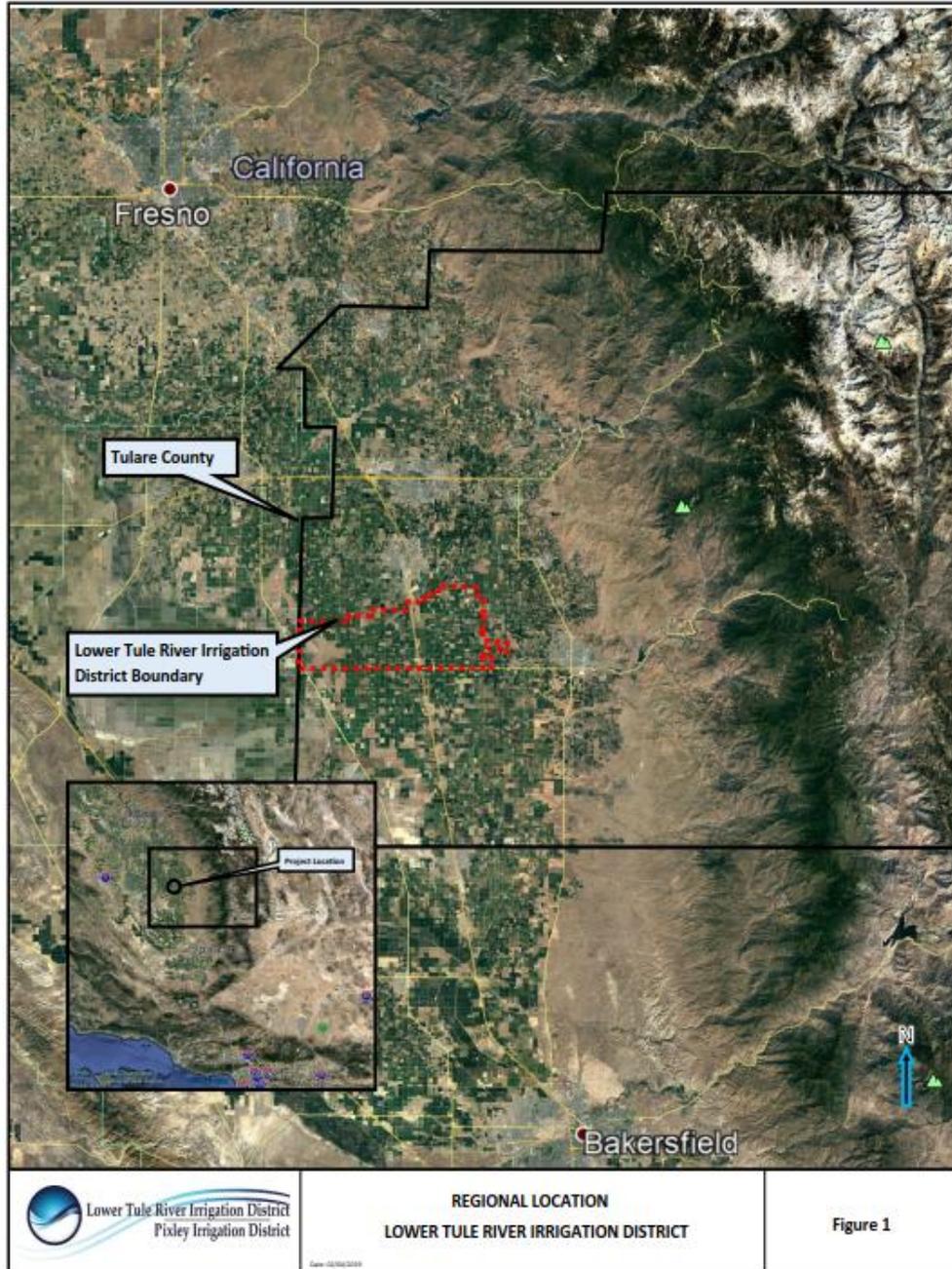
II. Background Information

A. Geographic Location

LTRID, located in Tulare County, California was formed in 1950 in order to provide reliable and high-quality supplemental surface water supply to its landowners who had previously met the water needs of their crops primarily by groundwater pumping. The District provides services to 103,034 acres within Tulare County, California and is located in the Central San Joaquin Valley, approximately 60 miles of southeast of the City of Fresno and approximately 45 miles northwest of the City of Bakersfield. The community of Tipton lies near the middle of the District and is the largest community within the Districts boundary. State highway 43, Highway 99, and Highway 190 travel though the District as shown in **Figure 1: Lower Tule River Irrigation District Regional Location**. Adjacent agricultural water agencies include

Corcoran Irrigation District to the West, Tulare Irrigation District to the Northwest, Lindmore Irrigation District to the Northeast, Pixley Irrigation District to the South, Saucelito Irrigation District to the Southeast, and Porterville Irrigation District to the East.

Figure 1: Lower Tule River Irrigation District Regional Location



B. Water Supply Sources

Surface Water Supply

The District's average annual surface water supply totals approximately 193,000 acre-feet per year (AF/year). This supply is generated from two main sources, the Tule River runoff diverted from Success Reservoir, and Central Valley Projects (CVP) imported surface water from the Friant-Kern Canal. The surface water supply for the District is drawn from pre-1914 Tule River water rights and contracts with Reclamation for CVP water from the Friant Division. The surface water supplies are summarized in **Table 1: Surface Water Supply Sources**

Table 1: Surface Water Supply Source

Surface Water Source	Average Annual Supply
Tule River	68,000 AF
Central Valley Projects (Friant Diversion)	125,000 AF
Total:	193,000AF

III. Existing Water Delivery System

A. Conveyance System

The existing District distribution system includes unlined earthen canals and pipeline distribution systems with reinforced concrete control structures and culverts at road crossings. Improvement districts were formed to provide local financing for the construction of the distribution systems. After completion, the facilities were turned over to the District for operation and maintenance. Collectively, the Districts owns or controls approximately 163 miles of open channel canals, and approximately 47 miles of Tule River channels with 10 miles of pipeline. The District has five main canals originating at the Friant-Kern Canal with capacity ranging from 25 cubic-feet per second (CFS) to 600 CFS. The main canals, described in **Table 2: LTRID Existing Facilities**, run from east to west with fall of the Valley floor in the area. The capacity of the sub-laterals branching out from the main canals range from 5 CGS to 100 CFS. The District has approximately 810 farm service outlets. Water delivery measurement are performed by means of calibrated slide gate (meter gates). The District does not have groundwater extraction facilities. Each individual landowner provides his own well(s) to sustain irrigation during periods when the District does not have surface water available. Additionally, the District maintains and operates 11 (**Table 3: Recharge Basin Facilities**) regulation and recharge reservoirs totaling approximately 562 acres.

The on-farm irrigation efficiency is not regularly calculated by the District, but within the region has been estimated to range from 75 to 85%. Seepage losses to the earthen canal system are regularly estimated from measuring stations throughout the system. The calculated average percolation rate in this area is 0.375 acre-feet/acre/day (AF/Ac/D). In the future of Sustainable Groundwater Management Act (SGMA), recharged water will help farmers during the drought. The reported amount of water recharged will be credited to its stakeholders to extract in lieu of surface water.

Table 2: LTRID Existing Facilities

	Diversion Sources	Description
1	Friant-Kern Canal	Casa Blanca/ Canal #1
2	Friant-Kern Canal	Poplar Ditch
3	Friant-Kern Canal	Tipton Canal/ Canal #2
4	Friant-Kern Canal	Wood-Central/ Canal #3
5	Friant-Kern Canal	North Canal/ Canal #4
6	Tule-River	Porter Slough
7	Tule-River	Poplar Ditch
8	Tule-River	Wood-Central Ditch
9	Tule-River	#4 Cross Ditch
10	Tule-River	McCarthy Diversion
11	Tule-River	Creighton Ranch

Table 3: Recharge Basin Facilities

	Recharge Basin Name	Acreage (AC)
1	Los Feliz Basin	37
2	Boswell Basin	74
3	Toledo Basin	130
4	State Basin	43
5	Baird Basin	60
6	Hutchinson Basin	66
7	Huddleston Basin	32
8	County Basin	60
9	Terry Basin	14
10	Hare Basin	13
11	Koslov Basin	33
	Total	562 Acres

IV. Working Relationship with Reclamation

The District has maintained a good working relationship with Reclamation while implementing projects, on schedule, which were funded by grants received by Reclamation

Riparian Area Distribution System Phase II

In 2018 LTRID was awarded by the Reclamation to construct a five-mile pipeline. The project includes construction of new surface water delivery via pipeline to a 7,000 acres area that previously did not receive surface water. Construction of the project will begin this March 2019 and will be finish by March 2020.

Tule River Intertie

In 2009, LTRID was awarded by the Reclamation to construct the Tule River Intertie to improve an existing earthen canal and construct 2.5 miles of new earthen canal. This construction allowed the District to divert Tule River water into portions of service area that could not previously receive surface water. This project improved flow measurement through the incorporation of new SCADA equipment along with replogle flume that works in conjunction with an automated

Langemann gate and minimizes the amount of surface water lost to irrecoverable river seepage. This project was started in 2009 and was finished in January 2012.

Pixley SCADA Avenue 116

In 2017, Pixley Irrigation District (PID) which is managed by LTRID staff, was awarded to implement a Supervisory Control Data Acquisition (SCADA) Program to help the District manage the flow of surface water in the headworks of the distribution system. Once the project was completed in 2018, the SCADA system allowed the District to increase the efficiency by minimizing the canal seepage and allowed the District to maximize the diversion into the canal distribution system, when water is available.

Water, Energy and Efficiency Grant for Avenue 116 Lateral Project

In 2012 PID was awarded a \$1.5 million grant from the Bureau of Reclamation for the Avenue 116 lateral Project. The project includes construction of anew surface water delivery system to an 8,000-acre area that previously did not received surface water. Construction of this \$4.8 million project begun in 2013 and was completed in March 2015.

Water, Energy and Efficiency Grant for System Optimization Review System

In 2011 the District completed a \$300,000 System Optimization Review Study that was partially funded by the Bureau of Reclamation. The study evaluated the District's operations and facilities, made recommendations on how to optimize available resources, and ranked potential projects to improve water reliability. The District completed the study on schedule under the allocated budget.

V. Technical Proposal

Project Description

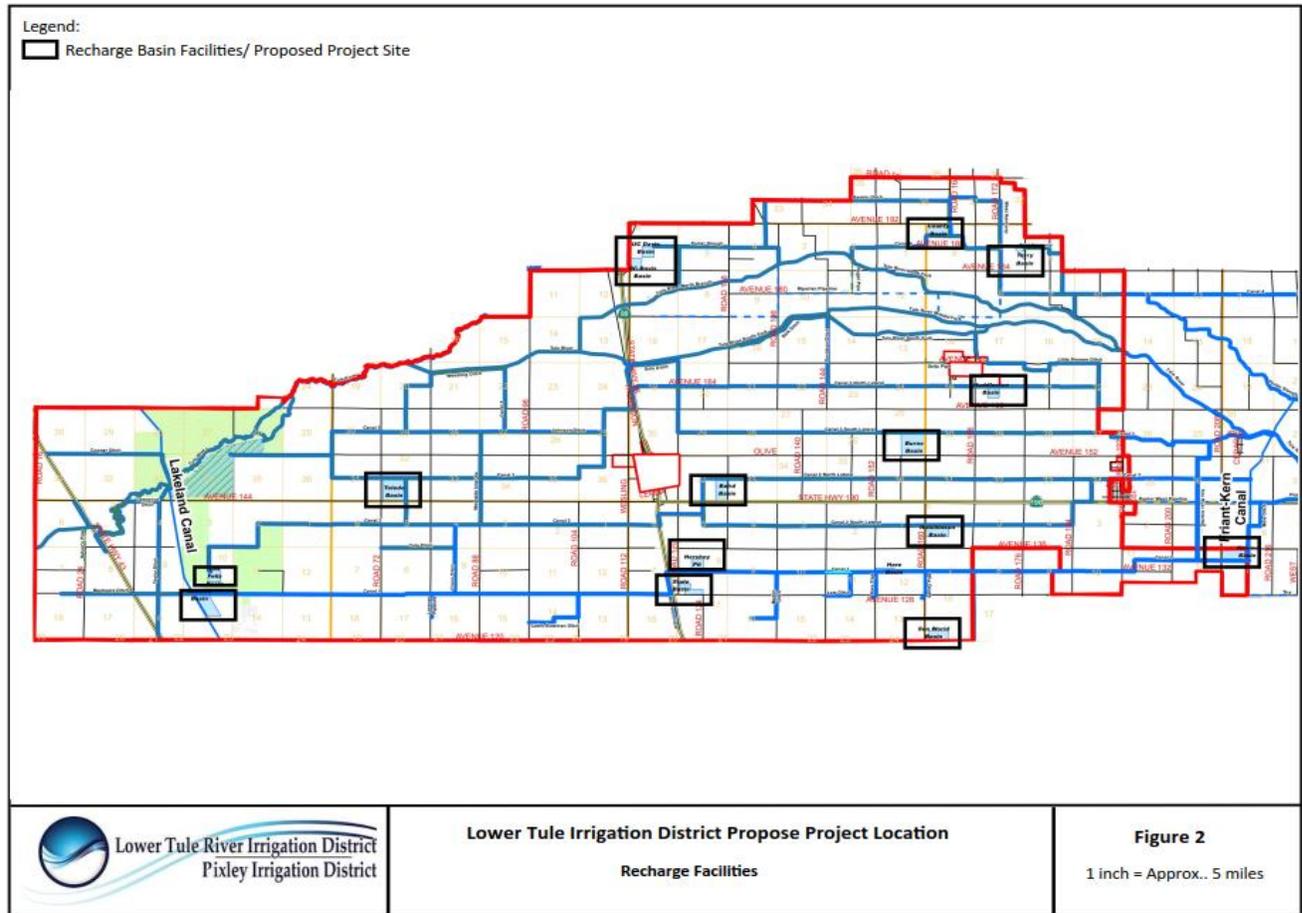
The District has identified that upgrading the water measurement and management of flows into the recharge basins is necessary. The manual measurement of water flowing into the recharge basins is less accurate and very inefficient. With the current operation, District staff manually measures the water flowing into the recharge basins and most of the time, water flowing into the recharge basin are less than full pipe flows, thus making it difficult for the most accurate measurement and efficient management of water.

The District plans to acquire twenty-five (25) Greyline Instruments AVFM 5.0 Ultrasonic Flow Meters to accurately account for the water being percolated to the underground. AVFM 5.0 gives the District the ability to read the meter remotely. Using a data collector, a District employee can strategically measure and manage recharged water.

The AVFM 5.0 Area-Velocity Flow Meter measures both level and velocity to calculate flow in an open channel or pipe. Calibration is simple, District staff can input the pipe diameter and the AVFM 5.0 will compute and display the flow volume. The

Ultrasonic sensor mounts inside the pipe with stainless steel mounting brackets and a simple screw into the bottom of the pipe.

Figure 2: Project Site



Task 1: Project Design and Permitting

During this task, Lower Tule Irrigation District will contract work with a third-party consultant to prepare any permits including CEQA/NEPA compliance, necessary to conduct this project. The District will secure all required permits and approvals from various regulatory agencies. Installation of meters in an existing structure may require several permits, if it deemed necessary by the reviewing agency, including a Mitigated Negative Declaration and other materials and activities as required by the California Quality Act (CEQA) and a Mitigated Finding of No Significant Impact and other materials and activities as required by the National Environmental Policy Act (NEPA). The District will work with a third-party to acquire CEQA/NEPA documentation after the grant has been awarded. Finally, the District will amass all the necessary project components, materials and equipment necessary for project installation.

Task 2: Construction

Task 2 of the proposed project will include installation of the meters. This task will be completed by District staff once all Task 1 objectives are complete.

The need for better water percolation accounting at the project locations has been identified by District staff and confirmed by professional engineers, to better plan for the future and accurately account for water for the stakeholders for SGMA implementation. While this project is relatively small in scope, it will address an important concern in the Lower Tule Irrigation District recharge facilities for continuous, uninterrupted, and accurate water delivery to its recharge basins. The accuracy and efficiency of water accounting in recharge basins is a key component of overall irrigation system management and is a worthy investment of resources.

Table 4: Project Schedule

Item	Estimated Time to Complete
Task 1: Project Design and Permitting	
1.1 Permitting and Approvals ¹	4-6 months
1.2 Meter Purchase	1 months
1.3 Electrical Design	1 months
Task 2: Construction	
2.1 Construction and Installation	2 months
Total Duration of Projects	7-8 Months
Estimated Start Date	October 2019
Estimated Completion Date	May 2020

VI. Evaluation Criteria

A. Evaluation Criterion A – Project Benefits (35 Points)

Up to 35 points may be awarded based upon evaluation of the benefits that are expected to result from implementing the proposed project. This criterion considers a variety of project benefits, including the significance of the anticipated water management benefits and the public benefits of the projects. This criterion prioritizes projects that modernize existing infrastructure in order to address water reliability concerns, including making water available for multiple beneficial uses and resolving water related conflict in the region.

- *Describe the expected benefits and outcomes of implementing the proposed project.*
 - This recharge basin metering project will result in water managed through increased measurement accuracy and operation efficiency and save labor and reduce fuel cost by eliminating the need to visit each recharge basin location multiple per times per day. The installation of a new and improved metering system with better accuracy and automatic reading capabilities will allow the District to better quantify the percolation rate and account for water. The proposed meters typically have an accuracy of +/- 0.25% for the water level and +/-2% for the velocity, while the District estimated accuracy is within

¹ If deemed necessary by the reviewing agency.

+/-10% with the existing measurement method. In addition, the ability to frequently review real time data will allow the District to identify inefficiencies or other issues quickly so the District can respond appropriately.

- *If Other benefits are expected explain those as well. Consider the following:*

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

-Once the AVFM is installed, better and more accurate accounting can be made. In implementing the District's Groundwater Sustainability Plan for SGMA purposes, the District needs the ability to account for water more accurately. These meters provide a more reliable source of data, thus, water that was percolated can be accounted for more precisely and provide the District with more accurate water budget and balance data

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

-Once the AVFMs are installed, accounting of water and water balance in the District will be more accurate, which will benefit the District and the Tule River Subbasin as a whole. With SGMA implementation, the accuracy of data sources, such as this, will be extremely important in calculating the sustainability of the Tule Subbasin.

- *Extended to which the proposed project will increase collaboration and information sharing among water managers in the region.*

-Once the AVFMs are installed, better data can be gathered in District wide. This information can be shared with other Districts and Groundwater Sustainability Agencies to determine subbasin sustainability.

- *Any anticipated positive impacts/benefits to local sectors and economics (e.g., agriculture, environment, recreation, tourism)*

-With better accounting of water, it would greatly impact the agriculture business in a positive way. The District can develop data sources that can determine and create water budgets for the future. The AVFM will help the District to better account for the recharged water and accounted for, for use in the future. Having more accurate percolation data will help the District create better water budgets and projections for the future, which will result in better planning data for the District and landowners of available groundwater pumping quantities going forward.

- *Extent to which the project will complement work done in coordination with NRCS in the area (e.g., with a direct connection to the district's water supply). Describe any on-farm efficiency work that is currently being completed or is anticipated to be complete in the future using NRCS assistance through EQIP or other programs.*

-Once the AVFM meters are in place District-wide, data collectors at radio relays sites can be added and implemented, which can be directly

- | | |
|------------------------------|--------------------|
| ○ February 2020 – March 2020 | Meter Purchase |
| ○ March 2020 – April 2020 | Meter installation |
| ○ May 2020 | Project Completion |
- *Describe any permits that will be required, along with the process for obtaining such permits.*
-The District will work with consultant to obtain all the permits necessary from the appropriate agencies. Once the grant is awarded for this project, the District will work with a third-party consultant to perform necessary permits including CEQA/NEPA compliance.
 - *Identify and describe any engineering or design work performed specifically in support of the proposed project.*
-The District will perform its own engineering work and will work with the vendor to properly calibrate the meters.
 - Describe any new policies or administrative actions required to implement the project.
-There is no expected need for new policies or administrative actions required to implement the project. The project is pretty straight forward, i.e. purchase meters and install them.

D. Evaluation Criterion D – Nexus to Reclamation (10 Points)

Up to 10 points may be awarded based on the extent that the proposal demonstrate nexus between the proposed project and a Reclamation project or activity. Describe the nexus between the proposed project and a Reclamation project or activity.

- *Is this proposed project connected to a Reclamation project or activity? If so how? Please consider the following:*
 - *Does the applicant receive Reclamation project water?*
-Yes. Lower Tule River Irrigation District receives Central Valley Project: Friant Division, contract number: 175R-2771R. The District has a Class 1 and Class 2 contract, 61,200 acre-ft and 238,000 acre-feet correspondingly.
 - *Is the project on Reclamation project lands or involving Reclamation facilities?*
-No, the proposed project is not on Reclamation lands or facilities.
 - *Is the project in the same basin as Reclamation project or activity?*
-Yes, the project is in the same basin as Reclamation project. The Friant-Kern Canal runs along the east-side of the Tule Subbasin and carries approximately 20 miles through the subbasin. The water is used as supplemental and irrigation supplies in the Tule Subbasin. Other districts with CVP Contracts are; Porterville Irrigation District, Saucelito Irrigation District, Teapot Dome Water District, Alpaugh Irrigation District and Terra Bella Irrigation District.
 - *Will the proposed work contribute water to a basin where a Reclamation project is located?*
-Yes, this project will contribute to better quantification of water in the Tule subbasin.

- *Will the project benefit any tribe?*
 -No, this project will not benefit any tribe in the area.

E. Evaluation Criterion E – Department of the Interior Priorities (10 Points)

Up to 10 points may be awarded based on the extent that the proposal demonstrates that the project supports the Department of the Interior priorities. Please address those priorities that are applicable to your project. It is not necessary to address priorities that are not applicable to your project.

- **Utilizing our natural resources** *(Ensure American Energy is available to meet our security and economic needs.)*
 - The proposed project will generate a reliable data that the District can manage. The reliable data insures the accountability of the amount of water recharged to the underground for water budget calculations under SGMA, in years of drought, this water will be able to be pumped by landowners to ensure the crops are sustained. By sustaining crops, it is ensured that there will be plenty of resources that will be available.
- **Restoring trust with local communities** *(Be a better neighbor with those closest to our resources by improving dialogue and relationship with persons and entities bordering our lands; expand lines of communication with Governors, state natural resources offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes and local communities.)*
 - The proposed project will contribute to a better partnership and communication with other water agencies and local agencies in the area. The reliable data can open new avenues and partnership with other local agencies, such as the disadvantage communities and public utility districts which can then developed a recharge banking partnership project to ensure reliable supply of water to the community. Other water district or irrigation district can partner with LTRID to recharge water in the existing facility in the wet years when water is available. This avenue of possible partnership can only be achieved if reliable data is available.

Evaluation Criteria Scoring Summary

Scoring	Points
A. Project Benefits	
B. Planning Efforts Supporting the Projects	
C. Project Implementation	
D. Nexus to Reclamation	
E. Department of the Interior Priorities	
Total:	

VII. Environmental and Cultural Resources Compliance

- *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?

-This project will be installing meters in an existing pipe. There is no need to any excavation or disturbance of soil, as the pipe are accessible. CEQA/NEPA will be performed once the grant has been awarded for this project.

- *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, how would they be affected by any activities associated with the proposed project?*
-There are no anadromous fish in the vicinity of the proposed project locations. Further studies will be performed during the CEQA/NEPA documentation.
- *Are there any wetlands or other surface water 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?*
-There are no wetlands or “Waters of the United States inside the project boundaries.
- *When was the water delivery constructed?*
-The water delivery system was constructed and initially started in 1950s, added more conveyance in the early 1990s and completed in the early 2000s
- *Will the proposed project result in any modification of or effects to, individuals feature of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those flumes were constructed and describe the nature and timing of any extensive alteration or modification to those features completed previously?*
- No. This AVFM project will be installing meters within the existing turn-out structures.
- *Are any buildings, structure, 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.*
- No, historical places will not be affected.
- *Are there any known archeological sites in the proposed project area?*
-There are no known archeological sites in the proposed project area.
- *Will the proposed project have a disproportionately high and adverse effect on low income or minority population?*
-There will be no effect since this project will be installing meters within the existing turn-out structures.
- *Will the proposed project limit access to and ceremonial use of Indian sacred sites or results in other impacts on tribal lands?*
-There will be no excavation for this proposed project and will not limit any ceremonial use of Indian Tribes.
- *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?*
-No. This project will not require excavation or disturbance of the soil.

VIII. Required Permits or Approvals

Any permit necessary to complete this project will be obtained prior to purchase, and installation. If it deemed necessary by the reviewing agency, the District will acquire the following; including a Mitigated Negative Declaration and other materials and activities as required by the California Quality Act (CEQA) and a Mitigated Finding of No Significant Impact and other materials and activities as required by the National Environmental Policy Act (NEPA). The District will work with a third-party to acquire CEQA/NEPA, and other permits necessary to complete this project.

VIX. Official Resolution

RESOLUTION No. 2019-04-2

APPLICANT'S NAME: LOWER TULE RIVER IRRIGATION DISTRICT

WHEREAS, the Board of Directors of the Lower Tule River Irrigation District is in agreement that an application be made to the Department of the Interior, Bureau of Reclamation (Bureau) for Funding Opportunity Announcement No. BOR-DO-19-F005, WaterSMART: Small-Scale Water Efficiency Grant for FY 2019, and to enter into an agreement to receive a grant from this funding source if said application should be successful, the Bureau has available grant funds, and the District's contribution to the effort as described in the application be acceptable to the Bureau. The General Manager of the District is hereby authorized and directed to prepare the necessary date, conduct investigation, file such application and execute a grant agreement with the Bureau.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors agreed and authorizes that:

- 1. The Board of Directors has reviewed and supports the proposal submitted;**
- 2. The District is capable of providing the amount of funding and in-kind contributions, specified in the funding plan; and**
- 3. If selected for the WaterSMART Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.**

DATED: _____

4/9/19



Eric Limas,
General Manager

X. Project Budget**I. Funding Plan and Letters of Commitment****Letter of Commitment**

There will be no source of project funding other than the applicant. No letter of Commitment from third parties are required. The District's Basic Financial Statements and Supplementary Information Year Ended December 31, 2018 (Certified Financials) are available to the Bureau upon request. The District has a reserve account that is more than healthy enough to meet the need contributions for their portion of the project. There are no expected incurred costs prior to the project start date.

II. Budget Proposal**Table 5: 2019 Funding Request Summary**

Funding Source	Percentage of Total Project Costs	Funding Amount
Lower Tule Irrigation District	57.0%	\$104,975
Reclamation Funding	43.0%	\$75,000
Other Federal Funding	0.0%	\$0
Total Project Funding	100.0%	\$179,975

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	\$/UNIT	QUANTITY		
SALARIES AND WAGES				
Manager	\$50	5	hrs	\$250
Administrator	\$20	5	hrs	\$100
Operation Staff 1	\$25	80	hrs	\$2,000
FRINGE BENEFITS				
Full-Time Employees (FT)	\$25	80	hrs	\$2,000
THIRD PARTY (CONTRACTOR)				
NEPA	\$15,000	1	each	\$15,000
CEQA	\$5,000	1	each	\$5,000
SUPPLIES AND MATERIALS				
Area-Velocity Flow Meter	\$3,225	25	each	\$80,625
Data Logger	\$1,610	25	each	\$40,250
Radio Transmitter	\$1,335	25	each	\$33,375
Computer Software	\$1,375	1	each	\$1,375
Total				\$179,975

The funds that the District is seeking to purchase the AVFM and data collector components and other components to bring the data inhouse.