

**Roza Irrigation District
AquaLastic Application MP 36.2-36.9
2018/19**

**Roza Irrigation District
125 South 13th Street
P. O. Box 810
Sunnyside, WA 98944**

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Executive Summary

Date: July 27, 2018

Applicant Name: Roza Irrigation District

City, County, State: Sunnyside, Yakima County, Washington

Contact Name: Rhoda Benson, PE, Project Manager

Telephone Number: (509) 837-5141

E-mail: bensonr@roza.org

This project will seal 0.7 miles of concrete canal liner in the Roza Irrigation District Main Canal (MP36.2 to MP36.9) by applying polyurea sealant (AquaLastic) over all cracks and joints within the wetted perimeter of the canal. The concrete liner preparation application and purchase of the sealant will be done by a contractor. The project is estimated to conserve approximately 800 acre-feet of water annually.

This project will take place between November 1, 2018 and March 10, 2019

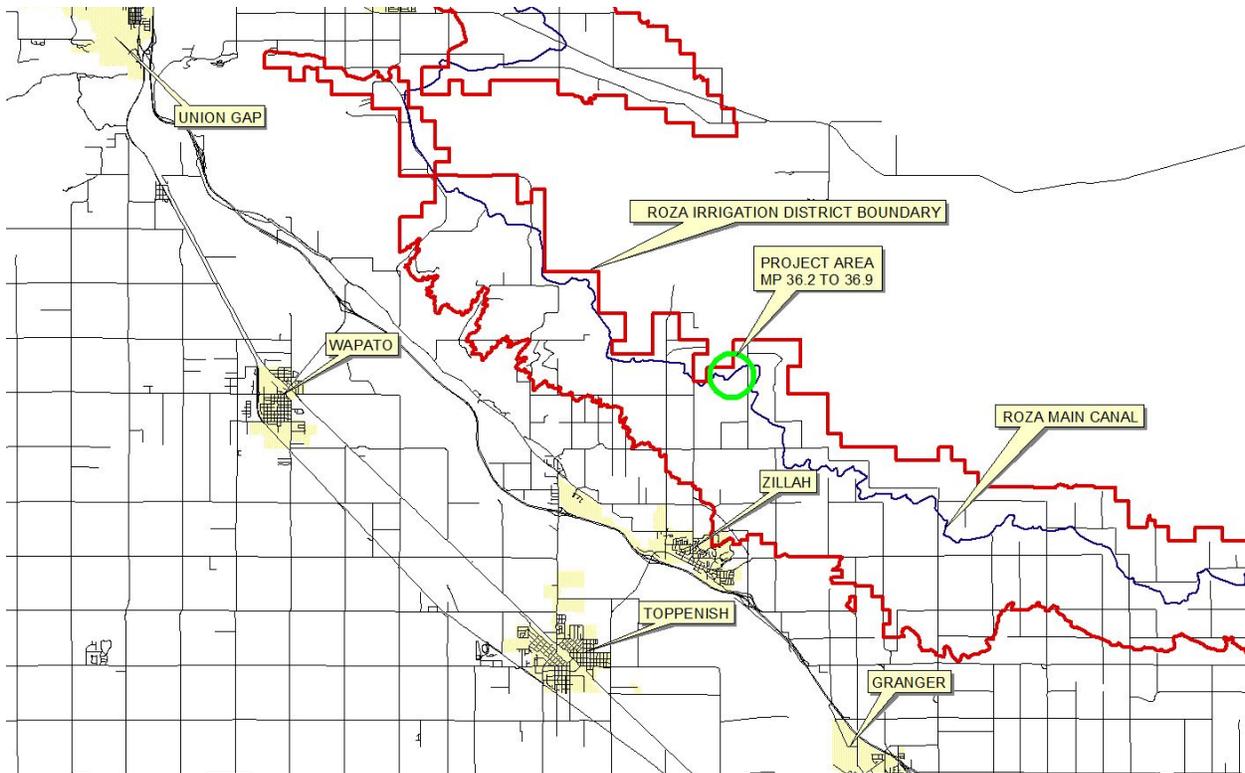
The Roza Irrigation District is part of USBR Yakima Project.

Background Data

The Roza Division is the third largest irrigation district in the Yakima Project and is one of seven Divisions that provide irrigation water serving primarily agricultural land for growing a large variety of fruits, vegetables, hops and wine grapes. There are also forage crops such as alfalfa, corn, and triticale supplying a significant dairy industry within the District.

The District serves approximately 1,550 landowners and contains over 72,000 acres of irrigable acreage lying north of the Yakima River in Yakima and Benton Counties of Washington State. Water is supplied to approximately 400 miles of lateral canals and enclosed conduit distribution systems via a 95 miles Main Canal originating at the Roza Diversion Dam. The dam is located on the Yakima River, 12 miles north of the city of Yakima. Of the 72,000 acres served, 27,000 acres lay upslope from the main canal and are served by 18 pumping stations which pump the water up the headworks of lateral canals.

The District has a Washington State Water Right Certificate of 375,000 acre-feet for irrigation of up to 72,600 acres. The District's Water Right Certificate has a May 10, 1905 priority date which allows the District to receive a full supply of water in non-drought years, but a proratable supply in drought years. The Yakima Basin experiences a severe drought on average of about every six years.



Prior Relationships with the Bureau of Reclamation:

Roza operates a USBR constructed facility. The USBR still operates and maintains the first 11 miles of the main canal which supplies water for power generation as well as irrigation.

Project Description

The lined sections of the Roza Canal have lining drains running longitudinally under the concrete liner with exits spaced about every 0.2 miles at locations where the water could gravity flow away from the Main Canal. The lining drains were intended for carrying ground water away from the liner during the fall and winter months to prevent liner damage caused by freeze/thaw cycles. These drains also help to prevent oversaturation of the Main Canal embankment during the irrigation season, so they must be kept open and operational even during the irrigation season. Most of the water that passes through the cracks and joints in the concrete liner of the main canal, passes out through lining drains. When the cracks in the concrete liner are sealed lining drains tend to reduce flow considerably or, most often, dry up completely.

Evaluation Criteria

E.1.1. 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 project. 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.

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

The project will result in a decrease in the amount of water diverted to the District in years of non-proration or proration down to about 80% of entitlement. The amount of the decrease in water diverted is the amount of water that will be kept in the Yakima Basin Storage to be used to meet the needs of the Yakima River Basin. Generally, this will translate to increased instream flows as needed to improve fish habitat.

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

In years that water supply for proratable users is less than 80% the conserved water will be used by the District to meet irrigation demand within the District. The estimated amount of conserved water is 800 acre-feet annually.

2. If other benefits are expected explain those as well. Consider the following:

Extent to which the proposed project improves overall water supply reliability

The saved water that does contribute to increased flows does address the element of the Yakima Basin Integrated Plan that calls on reducing irrigation demand by increasing efficiency of irrigation district canals and laterals. This in turn leaves more water in the river system to be used for wildlife habitat.

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

The Yakima River is the main source of irrigation water within the Yakima Basin. The Yakima Basin has experienced severe drought in 1977, 1992, 1993, 1994, 2001, 2005 and 2015. During those years the Roza Irrigation District received 63%, 58%, 65%, 35%, 45%, 53% and 47% respectively of its entitlement of water from the Yakima River. There

are many other years sprinkled in that the water supplied to the irrigation districts with junior water rights has been prorated during the irrigation season.

The water supply in the Yakima River is dependent on snow pack. In drought years, minimum flows in the Yakima River are maintained for fish habitat and the water supplied is prorated to the irrigation districts with junior water rights to accomplish this.

The junior districts (especially the Roza Irrigation District) within the Yakima Basin tend to produce the highest value crops such as wine grapes, cherries, blueberries, peaches, etc. So, crop reductions due to water shortages greatly affect the economic climate in the Yakima Basin.

Drought years also have an impact on fish habitat. When the Yakima River is at its lowest flows water temperature in the lower river tends to increase to levels that trout and salmon have difficulty surviving in.

Severe drought conditions result in reduced water delivered to farms which cause a reduction in crop output and/or quality. The economic losses in and out of the Yakima Valley can easily run into the hundreds of millions of dollars.

This project by itself would only conserve enough water for the Roza Irrigation District to run at minimum flow for about one half of one day. When compared to all of the other water conservation projects that have been implemented by the Roza Irrigation District, the resulting amount of water conserved per season is around 25,000 to 30,000 acre-ft. It is not single projects that make a difference in irrigation districts for Yakima Basin conservation, but many multiple projects implemented over the course of years and decades that really make a difference.

b) Extent to which the proposed project will increase collaboration and information sharing among water managers in the region

The Yakima Integrated Water Resource Management Plan (YBIP) was headed by the Washington State Department of Ecology and USBR and involved the Yakama Nation, irrigation districts, environmental organizations, and federal, state, county, and city governments. The Roza Irrigation District has been at the table at all discussions and helped to promote compromise and consensus among the various partners at the table. The process of collaboration of the YBIP continues on a regular basis with monthly workgroup meetings.

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

The Yakima River Storage system is only able to hold enough water for approximately 1/3 of the Basin's needs. The remaining water comes from snow pack. In recent decades the yearly snow pack has been less than adequate on a more frequent basis. Irrigation Districts with proratable water right in the Yakima Basin are dealing with severe drought on an approximate five to six-year basis rather than a ten-year basis as in past decades. Scientists are predicting that global increases in temperature will cause a decrease in snowpack in future years as more precipitation will come in the form of rain rather than snow. The Yakima Basin lacks adequate storage capacity to deal with this scenario. The obvious first defense against this scenario is reducing losses in irrigation canals so that more of the water diverted for irrigation purposes reaches the farms. This project directly addresses this by reducing seepage losses from the Main Canal. The reason that the District is spending money on sealing the canal is in direct response to the potential for serious drought and its associated economic impacts.

d) 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 completed in the future using NRCS assistance through EQIP or other programs

The assistance on farm by NCRS Programs has always been key for landowners in the Yakima Basin but has been particularly beneficial for those operating land on proratable districts that experience water shortages during droughts. Even though the projects themselves are different, they are all components of the overall water delivery system to the farm becoming more efficient.

E.1.2. Evaluation Criterion B—Planning Efforts Supporting the Project (35 points)

Up to **35 points** may be awarded based on the extent to which the proposed on-the-ground project is supported by an applicant's existing water management plan, water conservation plan, System Optimization Review (SOR), or identified as part of another planning effort led by the applicant. This criterion prioritizes projects that are identified through local planning efforts and meet local needs.

A. Describe how your project is supported by an existing planning effort.

From the Washington State Department of Ecology YBIP web page:

“In June 2009, Ecology and Reclamation brought representatives from the Yakama Nation, irrigation districts, environmental organizations, and federal, state, county, and city governments together to form the Yakima River Basin

Water Enhancement Project (YRBWEP) Working Group to help develop a consensus-based solution to the basin’s water problems. Over the next 18 months, the group developed the Yakima River Basin Integrated Water Resource Management Plan (Plan). Ecology and Reclamation issued a Programmatic Environmental Impact (PEIS) for the Plan March 2, 2012. The PEIS serves as a framework for the plan. Individual projects will each receive a more specific environmental review.

The Plan includes multiple elements. One of which is, Enhanced Water Conservation. The Integrated Plan provides both instream and out-of-stream benefits, including, conservation which stretches the amount of water available by using it more efficiently.”

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

The Yakima Integrated Water Resource Management Plan (YBIP) was headed by the Washington State Department of Ecology and USBR and involved the Yakama Nation, irrigation districts, environmental organizations, and federal, state, county, and city governments. The Roza Irrigation District has been at the table at all discussions and helped to promote compromise and consensus among the various partners at the table. To date The Ag Conservation Committee has approved \$1,020,000 of Grant monies for an assortment of Conservation Projects.

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

The Yakima Integrated Water Resource Management Plan (YBIP) was headed by the Washington State Department of Ecology and USBR has a subcommittee for Agriculture Conservation which is charged to seek applications from water users in the Basin for WDOE grant awards to support and encourage conservation projects. There is a ranking system that all applications are evaluated. To date The Ag Conservation Committee has approved and WA legislature has provided in the capital budget \$780,000 of Grant monies for applying AquaLastic Sealing in the Roza main canal.

E.1.3. Evaluation Criterion C—Project Implementation (10 points)

Up to **10 points** may be awarded based upon the extent to which the applicant is capable of proceeding with the proposed project upon entering into a financial assistance agreement. Applicants that describe a detailed plan (e.g., estimated project schedule that shows the stages and duration of the proposed work including major tasks, milestones, and dates) will receive the most points under this criterion.

A. 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.

Task 1: The Contractor will sandblast the concrete lining about 8 inches on either side of all existing cracks and panel seams. This work is normally done using an approximately 750 to 1,000 cfm air compressor attached to a truck mounted sand blasting unit. A hose runs from the sandblasting equipment to the person holding and directing the nozzle either from the bottom of the canal or from a man lift. When sandblasting the canal sides, the person directing the sandblasting nozzle is suspended out over the canal side panels in the bucket of a wheeled man lift which runs along the canal invert. There is also usually a second person helping to handle the hose.

The sand will be pushed and/or hauled upstream and downstream out of the work zone with a small loader placed in the bottom of the canal. Final cleaning will be done by directing an air nozzle from the air compressor along the canal invert until the sand piles up enough that it can be picked up and hauled with the loader. Once the areas adjacent to the cracks have been sandblasted and the excess sand cleared away, the concrete is ready for application of AquaLastic.

Task 2: The contractor will apply AquaLastic over all cracks and joints at a thickness of approximately 60 to 70 mils and approximately 4 to 6 inches either side of the cracks. The AquaLastic is delivered for use in two parts which must be mixed as it is applied. The Fifty-five-gallon drums are kept in a heated truck. The material is pumped through heated hoses where it passes through a mixer just before exiting the nozzle. It is sprayed on in much the same way that the sandblasting is done as noted in task 1. The product cures quickly and is ready for service by the next day

Dates:

- Invitation for Bid application contractor will occur in September of 2018.
- Contract documents will be signed by October 15, 2018.
- The sandblasting will take approximately 6 days to do.
- Application of the AquaLastic will take about 2 days.
- The contractor will have from approximately November 1, 2017 to March 10, 2019 to accomplish the work.
- Final project Report completed April 30, 2019

- The timing of the work will be dependent on weather conditions and the contractor's schedule

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

There are no permits required for this project

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

No Engineering necessary for this project

D. Describe any new policies or administrative actions required to implement the project.

None

E. Describe how the environmental compliance estimate was developed. Have the compliance costs been discussed with the local Reclamation office?

1% of TPC is used and recommended minimum for other WaterSMART grant applications.

E.1.4. Evaluation Criterion D— Nexus to Reclamation (10 points)

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

A. Is the proposed project connected to a Reclamation project or activity? If so, how? Please consider the following:

1. Does the applicant receive Reclamation project water?

Yes, the Roza Irrigation District receives its water from the Yakima River which is regulated by the Bureau of Reclamation as part of the Yakima Project.

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

Yes, the canal is a USBR transferred works. Reclamation continues to hold title to the facilities

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

Yes, the Roza Irrigation District is one of seven Divisions in the USBR Yakima project. Roza operates under a repayment contract with USBR and the canal sealing project is in an area of Transferred Works as described in the contract.

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

Yes. The conserved water represents excess water that would typically be diverted from the Yakima River to the Roza canal in order to meet irrigation demand by compensating for seepage. Since there will be less water diverted, water remains in the basin for other needs.

B. Will the project benefit any tribe(s)?

The project adds to the Total Water Supply Available in the Yakima Basin. This in turn makes more water available for USBR to manage with regard to any trust responsibilities it has to Tribes.

E.1.5. 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

1. Creating a conservation stewardship legacy second only to Teddy Roosevelt

- **Review DOI water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;**

The Yakima Basin Integrated Plan has been held in high regard in the United States as an example of a river basin conservation plan where water users with competing interests have stepped up and worked together to create a lasting legacy for all those presently living in the basin as well as future generations to come. This project is a very small but tangible step to bring all of us closer to meeting the goals created by this consensus plan for the health of our environment and conservation of our natural resources.

3. Utilizing our natural resources

- **Ensure American Energy is available to meet our security and economic needs;**

Water conservation and energy conservation go hand in hand. There are locations on the District that permanent pumps have been installed to pump the lining drain water back in to the main canal. During drought years, temporary diesel pumps are installed in locations where permanent pumps do not exist in order to reclaim water lost through the lining drains. When sealing is complete, pumps will be used less frequently, especially during drought years. During drought years farmers utilize emergency wells due to the reduced surface water available. This creates added strain on the electrical grid. Reducing water loss through the canal lining will allow more surface water to be delivered to farms. This will also reduce the electrical and fuel demands necessary to pump lost water back into the canal. The Life span of existing canal infrastructure will also be extended by reducing seepage through the canal lining.

BUDGET

Attachment I

Budget Narrative

Salaries and Wages

The program manager will be Rhoda Benson, Engineer. She will be responsible for preparing bid and contract documents and for project reporting.

Fringe Benefits

The District's Fringe benefits are 63%

This is the 2017 rate. The 2018 rate has not been finalized yet, but if the District is selected as a grant recipient, the 2018 rate will be used for final budget approval.

Travel

There will be no travel expenses for this project.

Equipment

There will be no equipment costs for this project.

Materials and Supplies

All materials will be supplied by the Contractor.

Contractual

A contractor will perform all work related to this project. Expected costs are shown in the budget. There are essentially two tasks associated with this work.

- Task 1: Sandblast all of the area to be covered with AquaLastic.
- Task 2: Apply the AquaLastic.

The District produced formal bid documents and requested bids for identical work to be done in another area of the main canal for the winter 2017-18. The bid prices were based on a price per gallon of AquaLastic to be applied. Since this was a formal bid advertised in local area newspapers and the request for bids allowed for anyone who was qualified to do this work, prices for the work to be done are about as good as you can get.

The costs estimated for this project are the same as 2018. The project distance can be scaled according to actual bid prices.

The 2018 Total Cost for material and labor was is \$77.12 per gallon applied AquaLastic.

Environmental and Regulatory Compliance Costs

Since this project pertains only to applying sealant to the existing concrete lining of the Main Canal, it is expected that Environmental and Regulatory costs will only be expended by USBR for NHPA documentation and will therefore be minimal. The cost estimated in the Budget is one percent of the total project costs.

Other Expenses

None

Indirect Costs

Indirect costs will not be charged to this project.

Total Costs

\$150,530.00

Roza Unique Entity Identifier in SAM:

The Roza Irrigation District SAM cage code is 1DVF2

Environmental and Cultural Resources Compliance

- **Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)?**

The sand from the sandblasting will settle to the bottom of the canal. This sand will be pushed into piles and picked up and taken downstream to an unlined section of canal and spread out to mix in with the existing soil. The quality of the surrounding soil, air, water, and animal habitat will not otherwise be affected since the polyurea will be sprayed on an existing concrete liner and will be cured and inert within minutes of application.

- **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 project takes place within a federally built irrigation canal, which receives water through fish screens. There are no species of wildlife within the project area that are threatened or endangered.

- **Are there wetlands or other surface waters inside the project boundaries that potentially fall under Clean Water Act (CWA) jurisdiction as “Waters of the United States**

There are no wetlands or other surface waters inside the project boundaries that potentially fall under Clean Water Act jurisdiction as “Waters of the United States”. The Roza Irrigation District Canal carries water for irrigation purposes.

- **When was the water delivery system constructed?**

Between 1936 and 1951.

- **Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., head gates, 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.**

The AquaLastic will be sprayed over all cracks and joints of an existing concrete liner in the Main Canal. No alterations or other affects will take place or result from this project.

- **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, the District facilities are more than 50 years old, therefore they must be evaluated through the NHPA for eligibility as historic features. This work will be done by the USBR field office and the State SHPO.

- **Are there any known archeological sites in the proposed project area?**

No

- **Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?**
No
- **Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?**
No
- **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

We have no letters of support.

The project area must be evaluated in accordance of the NHPA. The USBR area office does this work and sends the District a notice of the determination. Spraying on AquaLastic is usually considered as having no adverse effect and no mitigation is required. There are no other known Permits or Approvals required for this project

Official Resolution

Attachment II

Funding Sources

| Funding Sources | Percent of Total Project Cost | Total cost by Source |
|------------------------|-------------------------------|----------------------|
| Recipient Funding | 50% | \$75,665 |
| Reclamation Funding | 50% | \$75,000 |
| Other Federals Funding | 0% | \$0 |
| Totals | 100% | \$150,665 |

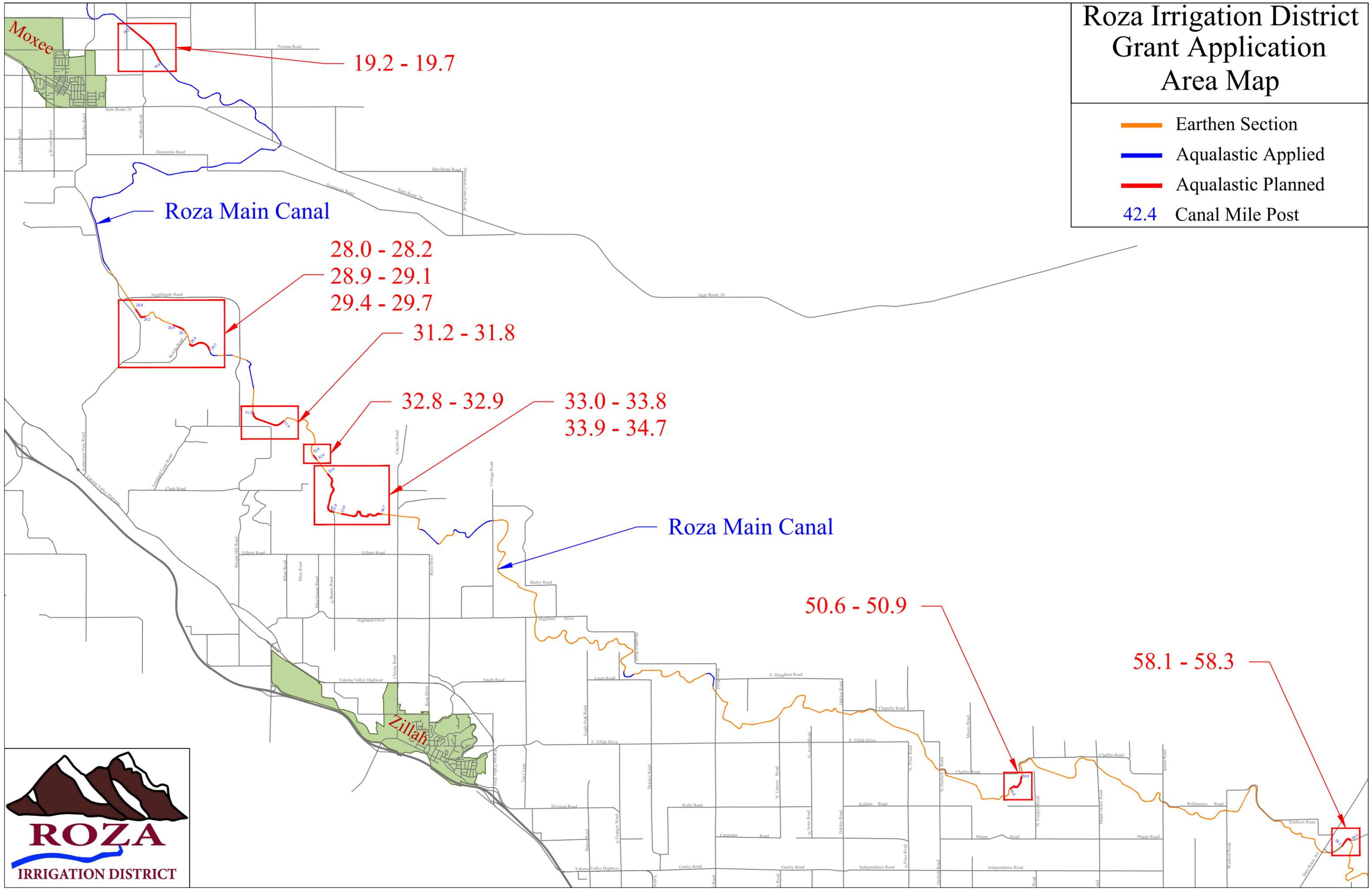
Proposed Budget - Aqualastic Project - 2018-19

50% 50%

| Budget Item Description | Computation | | | Recipient Funding | USBR Funding | Total Cost |
|--|-------------|---------|----------|-------------------|--------------|------------|
| | \$/Unit | Unit | Quantity | | | |
| SALARIES & WAGES | | | | | | |
| Rhoda Benson - Bid/Contract document administration | 35.62 | hours | 32 | 572 | 567 | 1,140 |
| FRINGE BENEFITS | 0.63 | | | 361 | 357 | 718 |
| Total Wages & Salaries | | | | 933 | 925 | 1,858 |
| SUPPLIES/MATERIALS w/tax | 45.37 | gallons | 1,850 | 42,153 | 41,782 | 83,935 |
| APPLICATION CONTRACT | | | | | | |
| Sandblasting | 15.11 | gallons | 1,850 | 14,038 | 13,915 | 27,954 |
| Material Application | 19.15 | gallons | 1,850 | 17,792 | 17,636 | 35,428 |
| SUBTOTAL PROJECT COSTS | 79.63 | | | 74,916 | 74,257 | 149,173 |
| ENVIRONMENTAL AND REGULATORY COMPLINACE (1% of project total) | | | | 749 | 743 | 1,492 |
| TOTAL PROJECT COSTS | | | | 75,665 | 75,000 | 150,665 |

Roza Irrigation District Grant Application Area Map

- Earthen Section
- Aqualastic Applied
- Aqualastic Planned
- 42.4 Canal Mile Post



19.2 - 19.7

28.0 - 28.2
28.9 - 29.1
29.4 - 29.7

31.2 - 31.8

32.8 - 32.9
33.0 - 33.8
33.9 - 34.7

50.6 - 50.9

58.1 - 58.3

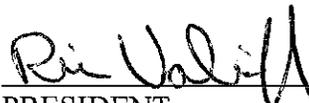


A RESOLUTION
No. 3 -2018

WHEREAS, the Roza Irrigation District desires to include 4,078 linear feet of Main canal MP 36.2 to MP 36.9 for the application of AquaLastic to seal the concrete lining for the 2018-19 construction season, at an estimated project cost of \$149,369. NOW, THEREFORE, IT IS HEREBY RESOLVED, that the Roza Irrigation District Board of Directors agrees and authorizes that:

1. The District Manager, SCOTT REVELL, has the legal authority to enter into an agreement for WaterSMART Small-Scale Project 2018-19 Grant financial assistance.
2. The Board has reviewed and supports the proposal submitted.
3. The applicant is capable of providing the amount of funding and/or in-kind contributions, specified in the funding plan; and
4. If selected for a WaterSMART Small-Scale Project 2018-19 Grant, the applicant will work with Reclamation to meet established deadlines for entering into a cooperative agreement.

DATED this 10th day of April, 2018.


PRESIDENT

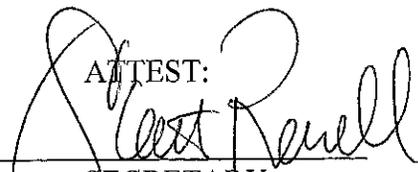

VICE-PRESIDENT


DIRECTOR


DIRECTOR


DIRECTOR

(SEAL)

ATTEST:

SECRETARY