

# **Feasibility of Rehabilitation and Replacement of Water Meters**

Sponsored by the

Bow Mar Water and Sanitation District

in conjunction with the

Colorado Water Conservation Board

July 2014

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# **Feasibility Study Bow Mar Water and Sanitation District Rehabilitation and Replacement of Water Meters**

## **Introduction (Need for the Project)**

The new meters shall provide a more accurate accounting of the individual customer usage. This will allow the district to better determine the amount of water which is being lost through leaks. The new meters shall be radio-read, which will save the district time and money, related to the actual reading of the meters. The new meters will allow the district to more accurately account for the effects of various conservation measures and programs also, the new system will enable the district to detect leaks on the service line and locate other non-revenue usage. The new billing system will include an Automatic Meter Reading Sensus Interface that will allow for the new meters to be read. It will also allow for customization in the rate structure and provide for more sophisticated conservation oriented rate structures.

## **Project Sponsor**

The Bow Mar Water and Sanitation District is a quasi municipal subdivision of the State of Colorado created under Title 32, Special Districts Article I, 32-14-204.5 Colorado revised statutes. Bow Mar Water and Sanitation District was created in 1951.

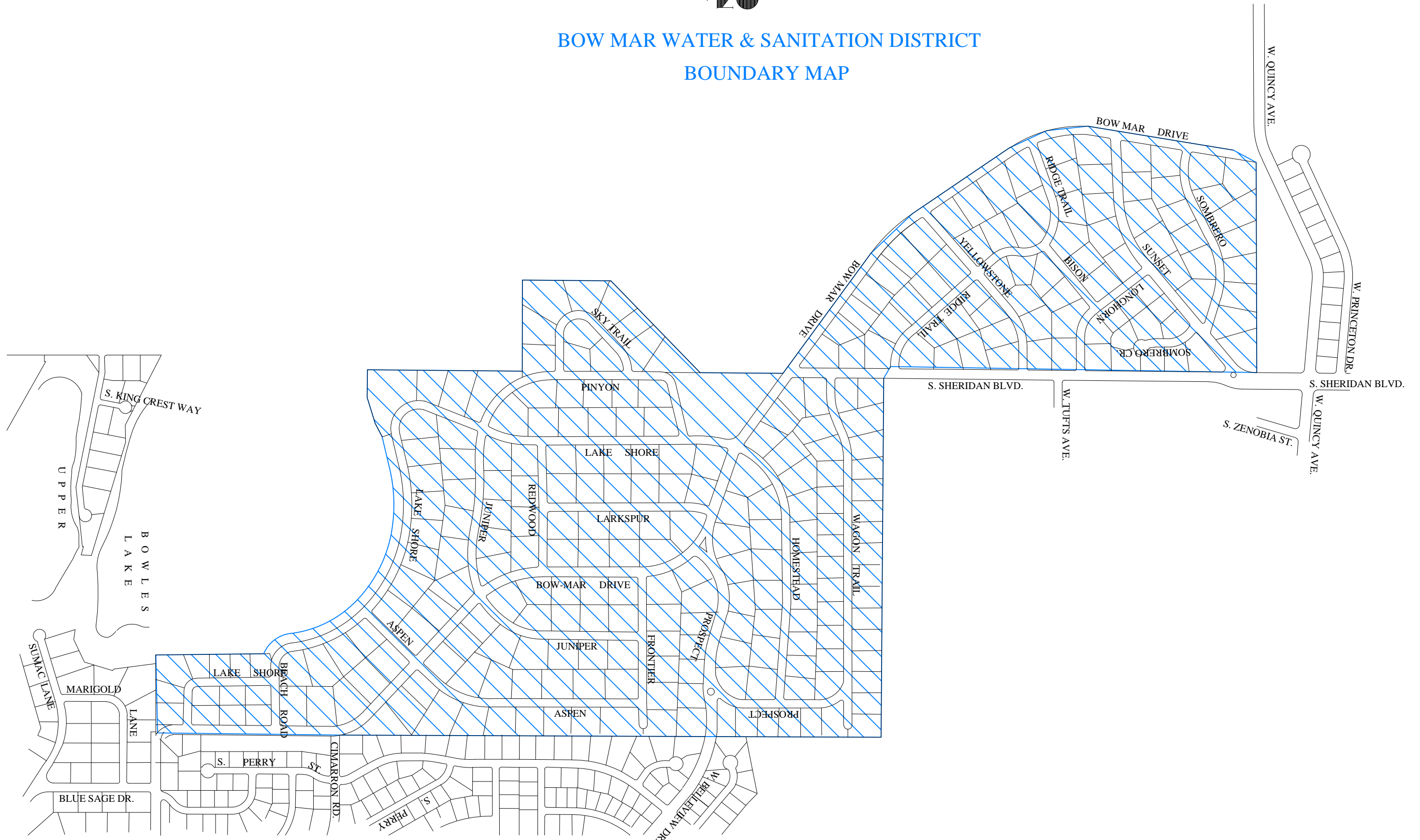
Bow Mar Water and Sanitation is a master meter distributor of Denver Water. The District serves 293 residential customer accounts. The annual water consumption is approximately 110 million gallons per year. The District utilizes master meters to monitor the amount of water from Denver Water, and each customer has an individual meter to track water use. Residential lots in Bow Mar are 1 acre in size.

## **Project Service Area and Facilities**

The District currently has a population of 733 (based on 2.5 persons per household/tap) and the District boundary encompasses .56 square miles. Bow Mar's population projections have not changed in the past 5 years and will not change in the future due to Bow Mar being an established subdivision with no potential of growth. A map of the service area is shown on page 6.



# BOW MAR WATER & SANITATION DISTRICT BOUNDARY MAP



## Project Description and Alternatives

The purpose of this program is to reduce the non-revenue water, water that is treated and delivered into the potable water distribution system, but is not accounted for, and generates no income and is essentially wasted. This is mainly due to inaccurate meters which are under reporting the use, due mainly to age. The meter replacement/rehabilitation program will replace 233 meters and rehabilitate 60 existing meters by replacing the meter register to accommodate automatic meter reading.

1. The no-action alternative.
2. Rehabilitate and replace existing out dated meters

**Alternative No. 1** was considered unacceptable due to the continuation of use of inaccurate meters, possible water waste and outdated billing system.

**Alternative No. 2** was selected because it provides for enhanced water conservation, offers potential for water conservation rate structure, reduced water loss and reliable water use information.

**The selected alternative, Alternative No. 2**, includes:

### Task 1 – Meter Rehabilitation

The rehabilitation of the 60 meters includes replacing the meter register with a new register and a MXU device that allows for automatic meter reading along with a 12" plastic inner lid for the MXU.

### Task 2 – Meter Replacement

The replacement of the 233 meters involves replacing the entire meter, a meter yolk or re-setter, and a MXU device for automatic meter reading and all miscellaneous appurtenances to install the yolk.

### Task 3 – Automatic Meter Reading Equipment

The automatic meter reading system will include a programming device, a hand-held receiver and software that will automatically read all 293 meters by radio and download readings to the office billing system.

### Task 4 – Billing Software

Update to the current billing system that allows for automatic meter reading.

The estimated cost of the completed project is \$366,018.43. The cost breakdown is summarized in Table 1.

**Table 1. Bow Mar Water and Sanitation District – Water Meter Rehabilitation and Replacement Project - Cost Estimate**

Item	Quantity	Unit Price \$	Amount \$
Task 1 – Meter Rehabilitation	60	\$371.25	\$22,274.70
Task 2 – Meter Replacement	233	\$1,311.49	\$305,576.19
Task 3 – Automatic Meter Reading Equipment			\$21,331.70
Task 4 – Billing Software			\$16,835.84
<b>Total</b>			<b>\$366,018.43</b>

## Implementation Schedule

The project is expected to begin January 2015 and to be completed by May 2015.

## Institutional Considerations

Entities that are, or may be, involved in the design, construction, and financing of the project include:

Bow Mar Water and Sanitation District; project management.  
C&L Water Solutions; construction  
Colorado Water Conservation Board (CWCB); financing

The Bow Mar Water and Sanitation District will be the lead for the design, and construction of the project and will be the entity entering into contracts and agreements with the various entities for the services provided by each.

## Financial Analysis

CWCB will be financing the estimated total project cost of \$366,018.43. The Bow Mar Water and Sanitation District is applying for a loan from the CWCB in the amount of \$329,416.59. The actual or estimated amounts by entity are given in Table 2.

**Table 2. Sources of Funding**

Entity	Grant	Loan	Percent Participation
CWCB	\$36,601.84	\$329,416.59	100%
<b>Totals</b>			<b>\$366,018.43</b>

The Bow Mar Water and Sanitation District will cover any costs that exceed the estimated project cost.



***Collateral:*** As security for the CWCB loan the Bow Mar Water and Sanitation District can pledge revenue from water rates.

## **Conclusions**

1. The project would provide for increased accuracy of water usage for billing, and potential water loss in the system. It would also provide for the implementation of tiered rate or other conservation oriented rate structures.
2. The total estimated cost of the project is \$366,018.43 and this will be financed, by a grant from the CWCB. The Bow Mar Water and Sanitation District is applying for a \$329,416.59 Water Project loan from the CWCB for the amount not covered by the CWCB grant.
3. The project is technically and financially feasible.

## **Appendix A**

### **CWCB Loan Application CWCB**

# COLORADO WATER CONSERVATION BOARD

## WATER PROJECT LOAN APPLICATION

**Instructions:** This application should be typed or printed neatly with black ink. Attach additional sheets as necessary to fully answer any question or to provide additional information that would be helpful in the evaluation of this application. When finished, please sign and return this application to:

**THE COLORADO WATER CONSERVATION BOARD**

Finance Section

1580 Logan St., Suite 600

Denver, CO 80203

Attn: Anna Mauss, P.E.

Phone: (303) 866-3441 x3224 Fax (303) 894-2578

Email: [anna.mauss@state.co.us](mailto:anna.mauss@state.co.us)

**Part A. - Description of the Applicant** (Generally, the applicant is also the prospective owner and sponsor of the proposed project)

1. Name of applicant \_\_\_\_\_

Mailing Address \_\_\_\_\_

\_\_\_\_\_

Business Phone (\_\_\_\_) \_\_\_\_\_ Fax (\_\_\_\_) \_\_\_\_\_

Federal ID Number \_\_\_\_\_ email \_\_\_\_\_

2. Person to contact regarding this application:

Name \_\_\_\_\_

Position/Title \_\_\_\_\_

Address \_\_\_\_\_

Business Phone (\_\_\_\_) \_\_\_\_\_ Cell (\_\_\_\_) \_\_\_\_\_

Email \_\_\_\_\_

3. Type of organization (Ditch Co., Irrigation District, Municipality, etc.): \_\_\_\_\_

Date of Annual Meeting \_\_\_\_\_

Is the organization incorporated in the State of Colorado? YES \_\_\_\_ NO \_\_\_\_ (If YES, please include a copy of the articles of incorporation, and the bylaws)

## CWCB Water Project Loan Application

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4. Please provide a brief description of the owner's existing water supply facilities and describe any existing operational or maintenance problems. Attach a map of the service area

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For existing facilities indicate:

Number of shareholders \_\_\_\_\_ or Number of customers served \_\_\_\_\_

Current Assessment per share \$ \_\_\_\_\_ Number of shares \_\_\_\_\_

Number of acres irrigated \_\_\_\_\_ Water Right: \_\_\_\_\_ CFS.

Average water diverted per year: \_\_\_\_\_ acre-feet.

### Part B. - Description of the Project

1. Name of the Project \_\_\_\_\_

2. Purpose of this loan application. Check one.

\_\_\_\_\_ New project  
\_\_\_\_\_ Rehabilitation or replacement of existing facility  
\_\_\_\_\_ Enlargement of existing facility  
\_\_\_\_\_ Emergency Repair  
\_\_\_\_\_ Other (describe) \_\_\_\_\_

3. If the project is for rehabilitation of an existing reservoir, is the reservoir currently under a storage restriction order from the State Engineer? YES \_\_\_\_ NO \_\_\_\_

4. General location of the project. (Please include county, and approximate distance and direction from nearest town, as well as legal description, if known.)

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5. Please provide a brief narrative description of the proposed project including purpose, need, facilities, type of water uses to be served and service area. Attach separate sheet, if needed.

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6. Will the acquisition of additional water rights be necessary? YES \_\_\_\_\_ NO \_\_\_\_\_

If YES, please explain. \_\_\_\_\_

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## **CWCB Water Project Loan Application**

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7. Please list the names, addresses and phone numbers of the Applicants' engineer(s) and attorney(s).

NAME

ADDRESS and PHONE

_____	_____
_____	_____
_____	_____

8. List any feasibility studies or other investigations that have been completed or are now in progress for the proposed project. If so, submit one copy of the study with this application

\_\_\_\_\_

\_\_\_\_\_

9. Estimated cost of the project. Please include estimated engineering costs, and estimated construction costs, if known.

Estimated Engineering Costs:\$ \_\_\_\_\_

Estimated Construction Costs: \$ \_\_\_\_\_

Estimated Other Costs: \$ \_\_\_\_\_ (land, water rights purchase, etc.)

Estimated Total Costs: \$ \_\_\_\_\_

10. Loan amount and terms you are requesting.

Requested Loan Amount: \$ \_\_\_\_\_ (Usually 90 % of est. Total Costs)

Term (length) of loan: \_\_\_\_\_ years (Usually 10, 20, or 30 years)

Interest Rate: \_\_\_\_\_ % (Please call for our current rates)

### **Part C. - Project Sponsor Financial Information**

Because the CWCB's Fund is a revolving fund, it is important that the project sponsor have the financial capacity to repay any loans made by the CWCB. The following information is needed to assist the CWCB in a preliminary assessment of the applicant's financial capacity. The project sponsor will submit the three most recent annual financial statements.

1. List any existing long-term liability (multi-year) or indebtedness that exceeds one thousand dollars. For example, bank loans, government agency loans, bond issues, accounts payable, etc. Include names and addresses of lenders, amounts, due dates and maturity dates.

## CWCB Water Project Loan Application

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<u>Lender Name &amp; Address</u>	<u>Remaining Amount</u>	<u>Annual Payment</u>	<u>Maturity Date</u>
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_____			
_____			
_____			

2. Are any of the above liabilities now in default, or been in default at any time in the past?  
YES \_\_\_\_ NO \_\_\_\_ . If YES, please give detailed explanation.

\_\_\_\_\_

\_\_\_\_\_

3. Please provide a brief narrative description of sources of funding, in addition to the CWCB, which have been explored for this project (Examples would be Banks, USDA Rural Development, NRCS, Colorado Water Resources and Power Development Authority, Colorado Division of Local Government, etc.). \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. What collateral will you be offering for this loan? Possibilities include a pledge of revenues, the project itself, real estate, water rights. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The above statements are true, to the best of my knowledge:

Signature of Applicant \_\_\_\_\_

Printed Name \_\_\_\_\_

Title \_\_\_\_\_

Date \_\_\_\_\_

## CWCB Water Project Loan Application

5. The original program entailed replacement of 93 existing meters over a 10 year span. The initial implementation commenced in 2005, with the replacement of 10 meters, which the District replaced at their own expense. Although the program is not proceeding at the pace which was originally intended, the potential benefits warrant the aggressive pursuit of this initial supply side program. The District's existing billing system cannot accommodate automatic meter reading and needs to be updated to a current billing system that allows for automatic meter reading. It will also give the District options for conservation geared billing that are not currently available such as a tiered billing structure, water budget, surcharge fees and monthly billing. This will benefit the district, and the individual customer(s) in the following manner:

1. The new meters will provide a more accurate accounting of the individual customer usage. This will allow the district to better determine the amount of water which is being lost through leaks.
2. The new meters will be radio-read, which will save the district time and money, related to the actual reading of the meters.
3. The new meters will allow the district to more accurately account for the effects of various conservation measures and programs. The new system will enable the district to detect leaks on the service line.
4. The new billing system will include an Automatic Meter Reading Sensus Interface that will allow meter readings to be seamlessly integrated with the billing system. It will also allow customization of the rate structure and will accommodate conservation oriented rate structures.

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## BOW MAR AUTOMATIC METER READING & METER REPLACEMENT/REHABILITATION PROJECT

		# of Meters	Price per meter	Materials Cost	Construction/ Labor Cost	Construction Inspection	Total Budget Cost	Loan	Grant Contribution
Task 1	Meter Rehabilitation								
	Sub-Total Task #1	60	\$371.25	\$14,832.60	\$1,980.00	\$5,462.10	\$22,274.70	\$20,047.23	\$2,227.47
Task 2	Meter Replacement								
	Sub-Total Task #2	233	\$1,311.49	\$116,550.59	\$167,784.10	\$21,241.50	\$305,576.19	\$275,018.57	\$30,557.62
Task 3	Automatic Meter Reading Equipment								
	Sub-Total Task #3			\$14,388.42	\$4,000.00	\$2,943.28	\$21,331.70	\$19,198.53	\$2,133.17
Task 4	Billing Software			Data West Corp.	Data West Corp.				
	Sub-Total Task #4			\$9,000.00	\$5,120.00	\$2,715.84	\$16,835.84	\$15,152.26	\$1,683.58
	TOTAL	293	\$1,249.21	\$154,771.61	\$178,884.10	\$32,362.72	\$366,018.43	\$329,416.59	\$36,601.84