



COLORADO

**Colorado Water
Conservation Board**

Department of Natural Resources

1313 Sherman Street, Room 718
Denver, CO 80203

April 21, 2017

Grand Valley Water Users Association
Attn: Mark Harris, General Manager
1147 24 Road
Grand Junction, CO 81505

RE: Notice to Proceed – WSRF Grant – **POGG1 2017-873** – Grand Valley Water Users Association
Grand Valley Roller Dam Rehabilitation Phase 2 Master Plan in the Colorado River Basin

Dear Mark,

This letter is to inform you that purchase order to assist in the above WSRF grant project has been approved. The original contract documents in the email serve as your copy.

With the executed agreement, you are now able to proceed with the project and invoice the State of Colorado for costs incurred through September 30, 2018 according to the Exhibit A schedule. Please provide the project name, contract/PO number, and basin when corresponding with or invoicing for your project along with back-up documentation of cost incurred for the WSRF portion of the grant according to the original scope of work. Upon receipt of your invoice(s), the State of Colorado will provide payment no later than 30 days after review and signed approval of the project manager.

Please refer to the WSRF Criteria & Guidelines reporting requirements for the six month progress reports and final deliverable details in order to avoid a delay in payment. A 30-day advance notice is required in the event you are seeking an amendment to the term of the contract and will require an official letter of request to the CWCB project manager briefly describing the need for the extension, updated insurance certificates and updated schedule.

If you have any questions or concerns regarding this project, please contact Anna Mauss, Project Manager at 303-866-3441 ext. 3234 or at Anna.mausse@state.co.us. When submitting invoices and progress reports, send them to Anna and cc me at dori.vigil@state.co.us. You can contact me at 303-866-3441 ext. 3250 for additional invoicing and payment disbursement questions.

Thank you.

Sincerely,

//s//

Doriann Vigil

Program Assistant II

O 303-866-3441 ext. 3250

1313 Sherman Street, Rm. 719, Denver, CO 80203

Dori.vigil@state.co.us / cwcb.state.co.com

Attachments





STATE OF COLORADO
Department of Natural Resources

ORDER		** IMPORTANT **				
Number: POGG1 PDAA 201700000873		The order number and line number must appear on all invoices, packing slips, cartons and correspondence				
Date: 04/18/17						
Description: pdaa 2500 WSRF grant GVVUA to fund GV Roller Dam Rehab		BILL TO				
Effective Date: 04/17/17 Expiration Date: 09/30/17		COLORADO WATER BOARD CONSERVATION 1313 SHERMAN STREET, ROOM 718 DENVER, CO 80203				
BUYER		SHIP TO				
Buyer:		COLORADO WATER BOARD CONSERVATION				
Email:		1313 SHERMAN STREET, ROOM 718 DENVER, CO 80203				
VENDOR		SHIPPING INSTRUCTIONS				
GRAND VALLEY WATER USERS ASSN 1147 24 RD GRAND JUNCTION, CO 81505-9639		Delivery/Install Date:				
Contact: .		F.O.B: FOB Dest, Freight Allowed				
Phone: .		VENDOR INSTRUCTIONS:				
Line Item	Commodity/Item Code	UOM	QTY	Unit Cost	Total Cost	MSDS Req.
1	G1000		0	0.00	\$50,000.00	☐
Description: pdaa 2500 WSRF grant GVVUA to fund GV Roller Dam Rehab						
Service From: 04/17/17 Service To: 09/30/17						
TERMS AND CONDITIONS						
https://www.colorado.gov/osc/purchase-order-terms-conditions						
DOCUMENT TOTAL = \$50,000.00						

Exhibit A
Statement of Work
Date: 12/10/16

WATER ACTIVITY NAME - Grand Valley Roller Dam Rehabilitation – Phase 2, Dam and Canyon Facilities Master Plan

GRANT RECIPIENT – Grand Valley Water Users Association & Orchard Mesa Irrigation District

FUNDING SOURCE - Grand Valley Water Users Association & Orchard Mesa Irrigation District

INTRODUCTION AND BACKGROUND

Provide a brief description of the project. (Please limit to **no more than 200 words**; this will be used to inform reviewers and the public about your proposal)

The Roller Dam diverts water into the Government Highline Canal for irrigation and hydropower purposes. The Roller Dam, which was constructed in the early 1900's, is in need of extensive upgrading and rehabilitation.

The proposed Master Plan Phase 2 for the Roller Dam Rehabilitation Project will develop 100% design level drawings, construction cost estimates, and specifications for top projects identified in the Phase 1 Master Plan. These top rehabilitation projects support maintaining the Cameo Call, improve water delivery system operations, capacity and reliability, sustaining the ecological health of the river and preserving the agricultural economy of the Grand Valley.

Phase 1 identified five priority projects, one of which is already underway which is lining a portion of the canal. The other top projects include: 1) upgrade the Roller Dam Electrical and Control Systems, 2) Rehabilitate the Canal Headworks, 3) Rehabilitate the Roller Tracks and Canal Concrete, and 4) Replace the Radial Gates at the Canal Station 22 spillway. These efforts will also include permitting and environmental compliance needed to support the construction of each project.

OBJECTIVES

Develop final designs, research permitting and environmental compliance requirements, develop technical specifications, and construction cost estimates for the following projects:

1. Upgrade the Roller Dam Electrical and Control Systems
2. Rehabilitate the Canal Headworks
3. Rehabilitate the Roller Tracks and Canal Concrete
4. Replace the Radial Gates at the Canal Station 22 Spillway

TASKS

TASK 1 – UPGRADE THE ROLLER DAM ELECTRICAL AND CONTROL SYSTEMS

Description of Task

The Master Plan Phase 1 efforts to support Upgrades to the Roller Dam Electrical and Control Systems included site visits by SGM and GVVUA staff and an evaluation of the electrical systems by EmTech. Budgetary repair and replacement of certain system elements were also provided by EmTech. These efforts serve as the basis for the task development to upgrade the Roller Dam Electrical and Control Systems.



The existing Roller Dam has an overhead three phase service from Xcel Energy. The largest load on the dam is a motor-generator which converts AC power to DC power. The DC power is then used to operate the seven roller gate motors. Each roller gate motor is 10 hp DC. The head gates are powered by a single 5 hp AC motor which transmits power to the gates via an elaborate bevel gear arrangement. The remainder of the power consumption at the dam is for house power and tools. It appears that there is very little if any automation on the roller gate controls. The head gates are controlled with a rudimentary mechanical level switch located downstream on the canal. The existing dam power distribution system and the DC motors powering the gates are obsolete and in need of replacement.



There are also several out buildings at the dam site, including the gate keeper's house, a shop, and two smaller buildings, which have electrical systems, which are in need of upgrades. These are separate single phase services and the wiring has been added on to and modified over time.

There are some outstanding questions concerning controls and automation for the operation of the dam gates and the canal head gates that will be considered and evaluated as part of this task. These (and other) questions will require some additional research and discussion amongst the stakeholders to arrive at the optimal long term solution.

There are several options for repowering the dam and the dam site that will require some additional research in an effort to support the selected option. Perhaps the biggest variable in the design of the electrical upgrades is re-use or replacement of the roller gate motors. As currently installed, the gates are operated using DC motors which have served well and had recent maintenance. The existing motors are served by a DC power buss which is obsolete and does not provide the redundancy needed to power this facility. If that DC buss is replaced with a new AC service (as recommended) the two probable options will be:

- Replace the existing motors with new AC motors and VFD drives.
- Retain the DC motors and provide AC to DC converters at each motor.

Method/Procedure

1. Research alternatives for the operation of the dam gates and the canal head gates.

2. Hold stakeholder meeting to discuss the results of the research and determine the optimal long term solution.
3. Research the DC versus AC power to the dam.
4. Research the re-use or replacement of the roller gate motors.

Once the research and stakeholder input is complete, the engineer will design construction documents for the Roller Dam Electrical and Control Systems. For specific designs see the deliverable section.

Deliverable

The deliverable will be Electrical System Upgrade Construction Documents. Once the project approach has been fully vetted, construction documents will be made. The documents will include:

- Design new electrical service and underground distribution for the site
- Design new electrical distribution for the dam
- Design controls / automation for the dam gates
- New head-gate power distribution and controls
- Electrical upgrades to the dam keeper's house and outbuildings

TASK 2 – REHABILITATE THE CANAL HEADWORKS

Description of Task

The Master Plan Phase 1 efforts to support the Rehabilitation of the Canal Headworks included site visits by SGM and GVWUA staff and an evaluation of the headworks structure by Municipal Treatment, Inc. An approach and scope and budgetary repair estimate were also developed. These efforts serve as the basis for the scope of work for this task to complete the headgate rehabilitation design for purposes of procuring a contractor to perform the work. The task will evaluate the existing gates/components structure, current alignment and stability, and determine if repair or replacement of the gates or components are needed.

Method/Procedure

1. Field survey of gates, frames, pedestals, and slides
2. Evaluate the alignment and stability of each gate installation.
3. Coordinate with gate suppliers and typical installation specification tolerances to determine if repair or replacement is required
4. If repair is determined to be appropriate, begin generating technical specifications and costs.
5. If replacement is determined to be appropriate, re-evaluate if a similar slide gate or an alternate gate assembly is the most effective solution

Deliverable

The deliverables will be developed for the appropriate repair or replacement option depending on the results of the field survey and evaluations. The deliverables will include:

- CAD layout of headworks, identifying the scope of work at each gate location, and develop appropriate repair/replacement details
- Technical specifications for repair/replacement

- General and special conditions to administrate the work
- Update to the Engineers Opinion of Probable Cost

TASK 3 – REHABILITATE ROLLER TRACKS AND CANAL CONCRETE

Description of Task

The Master Plan Phase 1 efforts to support the Rehabilitation of the Roller Tracks and Canal Concrete included site visits by SGM and GVVUA staff and an evaluation of the concrete erosion by Mays Construction. An approach, scope, and budgetary repair estimate were developed.



These efforts serve as the basis for the scope of work for this task to complete the repair design for purposes of procuring a contractor to perform the work. Task 3 has two projects; 1) Roller Tracks and 2) Canal Concrete. The two projects will include a field visit, discussion with the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) to determine acceptable methods for removal and disposal of concrete, and design of technical specifications for the proposed project.

Method/Procedure

Task 3a. Roller Tracks

1. Conduct a field survey of repair areas to establish the repair limits at each roller track.
2. Work with the CDPHE WQCD to determine acceptable methods for removal and disposal of the concrete.
3. Generate CAD layout of the dam, identifying the scope of work at each roller, and appropriate repair details.
4. Develop technical specifications for repair and cost details.

Task 3b. Canal Concrete

1. Conduct a field survey of channel walls and slab to establish the repair scope. This will involve establishing the original channel profile, which will establish repair concrete thicknesses, and guide the contractor during the repair concrete installation.
2. Work with CDPHE WQCD to determine acceptable methods for concrete removal and disposal.
3. Generate CAD layout of the channel, identifying the scope of work in each area of the walls and slab, and appropriate repair details.
4. Develop technical specifications for repair and cost details.

Deliverables

The deliverables for each task include generating a CAD layout of the project, identifying the scope of work specific to each project including the appropriate repair details, and technical specifications.

Deliverables will include:

- Task 3a: Generate CAD layout of the dam, identifying the scope of work at each roller, and appropriate repair details
- Task 3b: Generate CAD layout of the channel, identifying the scope of work in each area of the walls and slab, and appropriate repair details
- Task 3a and 3b: Develop technical specifications for repair
- Task 3a and 3b: Prepare general and special conditions to administrate the work
- Task 3a and 3b: Update the Engineers Opinion of Probable Cost

TASK 4 – REPLACE THE RADIAL GATES AT THE CANAL STATION 22 SPILLWAY

Description of Task

In the winter, when the canal is carrying water to the GVPP, the canal headgate and the Roller Dam rollers are typically frozen and not capable of being adjusted. The operation of Station 22 spillway operations is essential to address and mitigate any emergencies within the canal and GVPP operations during these times.



The radial gates need to be replaced in order to keep the Station 22 spillway functional. The frames supporting both radial gates are rusting out requiring the gates to be completely rebuilt or replaced with a more modern design. Each gate is uniquely designed and will require a review of the historical drawings and reissued before a local craftsman can rebuild them. More modern replacement options such as vertical lift gates could be used and will be easier to maintain in the future.

Additional design considerations will also be needed to evaluate options for preventing ice buildup on the gates to make sure they remain operational throughout the winter. Further design is needed to update the crude electric hoists on one radial gate and the hand operated hoist for the other gate. Upgrading the hoists will allow for more accurate and efficient operations of the gates especially during an emergency situation.

The Master Plan Phase 1 efforts to support the Replacement of the Radial Gates at the Canal Station 22 Spillway included site visits by SGM and GVWUA staff and an evaluation of the structure by Municipal Treatment. An approach and scope and budgetary repair estimate were also developed. These efforts serve as the basis for the scope of work for this task to complete the repair design for purposes of procuring a contractor to perform the work.

Method/Procedure

1. Conduct a field survey of walls and slab to determine condition of the concrete and dimensional properties of gate bays. This will determine level of repair and modification for new gate installation.
2. Evaluate the two gate type options; radial or slide. Consider operational advantages of each, and modifications that may be required. Additional hydraulic analysis will be performed should one option require construction which would reduce the discharge area.
3. Prepare a Technical Memorandum with findings and Engineer's Opinion of Probable Cost for Association and OMID review and selection.

Deliverable

The deliverables will be a final design of the selected option and technical specifications including:

- Complete final design of selected option, including CAD drawings depicting concrete repair and installation requirements. This will include site work, and extension of electrical power.
- Prepare Technical Specifications for gate, motor and ancillary equipment procurement.

TASK 5 – Project Management

Description of Task

SGM will provide the necessary communications and coordination necessary to support efficient, effective, and timely project execution. SGM

Method/Procedure

1. Hold one internal project kickoff meeting and initiate QA/QC processes.
2. Conduct monthly project budget and schedule checks and review invoices
3. Communicate with the Association and OMID staff, as needed, on project progress, etc.
4. Internal coordination and communication

Deliverable

The deliverables will be monthly project status updates, progress reports every six months, and a final report at the end of the project.

- Monthly project status updates with invoices.
- Progress reports every 6 months, beginning from the date of the executed contract. The progress report will describe the completion or partial completion of the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.
- Final Report: At completion of the project, the Association will provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

REPORTING AND FINAL DELIVERABLE

Reporting: The applicant will provide the CWCB a progress report every 6 months, beginning from the date of the executed contract. The progress report will describe the completion or partial completion of

the tasks identified in the statement of work including a description of any major issues that have occurred and any corrective action taken to address these issues.

Final Deliverable: At completion of the project, the applicant will provide the CWCB a final report that summarizes the project and documents how the project was completed. This report may contain photographs, summaries of meetings and engineering reports/designs.

BUDGET

The budget is summarized in Table 1 and a detail budget by tasks is provided in Table 2. The other direct costs include mileage only.

Table 1. Overall Budget.

Task Activity Description	SGM Professional Services	Other Direct Costs (mileage)	Total Project Costs	WSRF Basin Grant Request	Association and OMID Cash Matching Funds	BOR Field Services Grant	River District Support
Task 1 – Upgrade the Roller Dam Electrical and Control Systems	\$42,880	\$200	\$43,080	\$15,000	\$3,080	\$15,000	\$10,000
Task 2 – Rehabilitate Canal Headworks	\$23,110	\$200	\$23,310	\$10,000	\$3,310	\$2,000	\$8,000
Task 3 – Roller Track & Canal Construction Rehabilitation	\$33,180		\$33,180	\$10,000	\$3,180	\$10,000	\$10,000
Task 4 – Replace Radial Gates at the Canal Station 22 Spillway	\$22,748		\$22,748	\$10,000	\$2,748	\$3,000	\$7,000
Task 5 – Project Management	\$17,596	\$200	\$17,796	\$5,000	\$2,796	\$10,000	
Association Project Coordination Costs			\$5,000		\$5,000		
Total Costs	\$139,514	\$600	\$145,114	\$50,000	\$20,114	\$40,000	\$35,000

Table 2. Detailed Budget by Task.

SCHEDULE OF FEES																
Dam and Canyon Facilities Master Plan Phase 2																
PHASES AND TASKS	SGM PERSONNEL HOURS										SGM					
	P/C	PM	EE	HE	SE	TE	EE	UE	CAD	SPM	FS1	ST	ADM	Subtotal of Hours	Labor Cost	
1.0 Upgrade the Roller Dam Electrical and Control Systems														360	\$	42,880
1.1 Electrical System Design			120											120		\$18,360
1.2 Develop Construction Documents			40						200					240		\$24,520
Subtotal Task 1	0	0	160	0	0	0	0	0	200	0	0	0	0	360		\$42,880
2.0 Rehabilitate Canal Headworks														194	\$	23,110
2.1 Evaluate Existing Gate Frames and Slides	16			24						2	8	8		58		\$7,878
2.2 Develop Final Design and Construction Documents	16			32	8				80					136		\$15,232
Subtotal Task 2	32	0	0	56	8	0	0	0	80	2	8	8	0	194		\$23,110
3.0 Roller Track & Canal Conc Rehabilitation														252	\$	33,180
3.1 Roller Track Rehabilitation														0		\$0
Field Survey	8									2	8	8		26		\$3,518
Coordination with CDPHE	8	4												12		\$1,984
CAD layout of dam, repair notes & details	8			8					40					56		\$6,216
Technical Specifications	12												6	18		\$2,544
General & Special Conditions	6												4	10		\$1,338
Engineers Opinion of Probable Cost	6													6		\$1,074
Subtotal Task 3.1	48	4	0	0	8	0	0	0	40	2	8	8	10	128		\$16,674
3.2 Canal Concrete Rehabilitation														0		\$0
Field Survey	8									2	16	8		34		\$4,718
Coordinate with CDPHE	8	4												12		\$1,984
CAD layout of channel	8								40					48		\$5,112
Technical Specifications	12												6	18		\$2,544
General & Special Conditions	6													6		\$1,074
Engineers Opinion of Probable Cost	6													6		\$1,074
Subtotal Task 3.2	48	4	0	0	0	0	0	0	40	2	16	8	6	124		\$16,506
4.0 Replace Radial Gates at the Canal Station 22 Spillway														178	\$	22,748
4.1 Field Survey	8									2	8	8		26		\$3,518
4.2 Evaluate gate options	12	2	4	16			4							38		\$5,600
4.3 Technical Memorandum presenting gate options	8	2		12			2						4.0	28		\$3,742
4.4 Final design of selected gate option	8			12			8		40					68		\$7,800
4.5 Technical Specifications for gate procurement	4			8									6.0	18		\$2,088
Subtotal Task 4	40	4	4	48	0	0	14	0	40	2	8	8	10	178		\$22,748
5.0 Project Management														134	\$	17,596
5.1 Meetings and Correspondence		54		40										94		\$12,332
5.2 Project Setup/Close Out/Invoicing		16												16		\$2,208
5.3 Reporting to CWCB		8		16										24		\$3,056
5.4 Association Project Coordination Costs														0		\$5,000
Subtotal Task 5	0	78	0	56	0	0	0	0	0	0	0	0	0	134		\$22,596
Other Direct Costs																\$600
TOTALS	168	90	164	160	16	0	14	0	400	8	40	32	26	1,118		\$145,114

SCHEDULE

The overall schedule for these tasks is estimated at 4-5 months for the Design Development and 3-4 months to finalize the Construction Documents once the respective design development documents have been approved.

See Table 3 for an estimation of Finish date from the Notice to Proceed (NTP) timeframe. This dating method allows flexibility in the event of potential delays from the procurement process.

Table 3: Project Schedule

Task	Start Date	Finish Date
1.1 Upgrade the Roller Dam Electrical and Control Systems Research, Evaluation, and Field Survey	APRIL 2017	+135 DAYS
2.1 Evaluate Existing Gate Frames and Slides at Canal Headworks- Research, Evaluation, and Field Survey	April 2017	+135 DAYS
3.1 Rehabilitate Roller Tracks and Canal Concrete- Research, Evaluation, and Field Survey	April 2017	+135 DAYS
4.1 Replace the Radial Gates at the Canal Station 22 Spillway- Research, Evaluation, and Field Survey	April 2017	+135 DAYS
1.2 Upgrade the Roller Dam Electrical and Control Systems- Electric systems Upgrade- Technical Specification and Construction Documents	Finish task 1.1	Completed Task 1.1 + 120 days
2.2 Evaluate Existing Gate Frames and Slides at Canal Headworks- Technical Specification and Construction Documents	Finish task 2.1	Completed Task 2.1 + 120 days
3.2 Rehabilitate Roller Tracks and Canal Concrete- Technical Specification and Construction Documents	Finish task 3.1	Completed Task 3.1 + 120 days
4.2 Replace the Radial Gates at the Canal Station 22 Spillway- Technical Specification and Construction Documents	Finish task 4.1	Completed Task 4.1 + 120 days
5- Project Management- On going throughout project	Upon NTP- APRIL 2017	
6- Pre-Construction Coordination-	Upon completion of Tasks 1.2, 2.2, 3.2, and 4.2	

NTP = Notice to Proceed

PAYMENT

Payment will be made based on actual expenditures and invoicing by the applicant. Invoices from any other entity (i.e. subcontractors) cannot be processed by the State. The request for payment must include a description of the work accomplished by major task, and estimate of the percent completion for individual tasks and the entire water activity in relation to the percentage of budget spent, identification of any major issues and proposed or implemented corrective actions. The last 5 percent of the entire water activity budget will be withheld until final project/water activity documentation is completed. All products, data and information developed as a result of this grant must be provided to the CWCB in hard copy and electronic format as part of the project documentation. This information will in turn be made widely available to Basin Roundtables and the general public and help promote the development of a common technical platform.