STATEMENT OF WORK

WATER ACTIVITY NAME – Hanson Dam Outlet Rehabilitation

GRANT RECIPIENT – Leroux Creek Water Users Association

FUNDING SOURCE – Gunnison Basin Water Supply Reserve Account

INTRODUCTION AND BACKGROUND:

The Hanson Outlet Rehabilitation would involve replacing an existing downstream outlet valve on Hanson Reservoir, one of 28 reservoirs owned and operated by Leroux Creek Water Users Association (LCWUA). The current outlet was inspected as part of a Leroux Creek Dam Inventory study which was funded by the Gunnison Basin Roundtable to evaluate and prioritize needs on all the reservoirs. The final study will be completed in April of 2010, but during the study, problems were noted with the Hanson outlet. After consulting with the Dam Safety Engineer this outlet issue became the highest priority. Inspection of the outlet and original dam plans indicated the existence of an inoperable valve buried in the embankment 20 feet upstream of the current outlet valve. This buried valve has developed leakage around the stem which is producing a wet area on the dam slope. The Dam Safety Engineer has indicated the need to repair this problem due to safety concerns. Hanson Reservoir dates from the early 1900's with a 1904 water right. It holds 300 af of water which is used primarily for irrigation on 2000+ acres of mixed fruit, small grains alfalfa and pasture. The Town of Hotchkiss municipal water supply also comes from LCWUA.

OBJECTIVES:

The project will preserve the storage facility by satisfying State regulatory requirements, by improving public safety and by enhancing serviceability. Without implementation of the safety improvements, either the storage capacity will be reduced or the dam will be breached by regulatory mandate.

TASKS:

TASK 1 – Field Investigations, Design, Permitting, Bidding

Description of Task

Field Surveys, geotechnical investigations, outlet examinations, design engineering, preparation of design drawings, preparation of design reports, submittal of design documents for State Engineer's review and approval, preparation of permitting applications and documentation and solicitation of construction bids.

Method/Procedure

Mapping using standard survey methods will be performed of the areas to be disturbed including the dam embankment, borrow areas and haul roads. Test holes will be excavated and laboratory testing of recovered samples will be performed for the embankment, foundation and borrow areas. The outlet inspections will be conducted and reviewed to establish the condition of the existing outlet features. Design drawings will include all necessary details needed for review as well as construction. A design report will be prepared which details the engineering data, assumptions, analyses, conclusions and

calculations. The design documents will be submitted to the State Engineer's office. Applications will be made to the US Forest Service and the US Army Corps of Engineers for permits. Construction bids will be solicited from selected contractors.

Deliverable

Design drawings and reports, State Engineers' approvals, permits and construction bids.

TASK 2 – Construction of Outlet Rehabilitation

Description of Task

Excavate the existing outlet pipe, install drains, install new outlet pipe, backfill excavation, reshape disturbed areas and reseed.

Method/Procedure

Excavation to the portion of outlet conduit which will be replaced will be done in a trench. Special measures and efforts will be made to reduce the potential for establishing seepage paths through the embankment due to vertical trench excavation walls. These items will include internal drains, careful preparation of excavation walls and careful conditioning of borrow soils. Trench walls will be stabilized by use of trench boxes during construction. The boxes will be installed as the excavation progresses. High clearance type of boxes will be used to provide un-obstructed working space beneath the lowest spreader. Maximum excavation depth is expected to be 13 to 14 feet.

Borrow material for trench backfill will be obtained from the right side of the spillway channel at a location approximately 50 feet downstream from the spillway crest. This borrow location was selected based on the likelihood of it producing material which will have a suitable moisture content without excess conditioning. It may also slightly increase the capacity of the spillway channel in this area. The final borrow excavation topography will be contoured so that the flow and capacity of the spillway channel is, in no manner, restricted.

Backfill compaction will be by use of a vibratory sheepfoot walk-behind type compactor. Moisture, lift thickness and compactor passes will be adjusted to provide the desired backfill characteristics. The trench boxes will be raised in increments so the bottom of the box is above the top of the backfill to provide positive contact between the trench wall and the backfill material as it is being compacted.

Deliverable

Completed outlet Rehabilitation.

TASK 3 – Upstream Valve Installation

Description of Task

Installation of a new upstream valve to improve the safety and serviceability of the dam.

Method/Procedure

The upstream end of the pipe (exposed bell) will be cut off and removed and the area around the pipe inlet will be excavated to receive the new intake structure.

Because of the difficulty in providing transit mixed concrete at the site for cast-in-place structures, the intake structure

will be precast. It will be cast with the gate seat and air vent connection in-place. If necessary, the intake structure will be cast in modular components to reduce the weight and facilitate transport to the site. Provisions will be installed in the intake structure to allow for bypass of natural stream flow beneath the intake sill and gate intake so that installation of the gate and other intake completion tasks can be performed in the dry. This temporary bypass will be plugged upon completion of the intake structure.

The foundation for the intake structure will be stabilized using gravel.

The intake structure will be attached to the existing pipe using flexible couplings to facilitate attachment of the intake pipe to the existing pipe.

A swinging trashrack will be provided over the intake.

The gate will consist of a medium-pressure slide gate. The operating stem will be encased in heavy-wall galvanized steel pipe for longevity which will be oil filled. The air vent line will also consist of heavy-wall pipe.

The operating stem casing and air vent pipe will run up the upstream slope of the dam and be supported on precast concrete pedestals. The stem casing and air vent pipe will be buried to prevent ice uplift.

The handwheel block will also be precast and be sized to resist the gate stem operating forces.

Deliverable

Completed upstream valve installation.

TASK 4 – Construction Inspection, Quality Assurance Testing and Completion Report

Description of Task

The State Dam Safety Regulations require that the Engineer state that all construction was performed in accordance with the approved design documents and the provisions of the Regulations. Therefore, essentially full time inspection/testing is required.

Method/Procedure

The Engineer will be on-site for nearly all of the construction activities, will provide all field materials sampling and laboratory quality assurance testing. The Engineer will also produce as-constructed drawings along with a Completion Report which details all construction activities, field design modifications and description of the cause, copies of inspection reports and copies of test results.

Deliverable

As-Constructed drawings and Completion Report.

BUDGET

HANSON OUTLET REPAIR COST ESTIMATE						
ITEM	UNIT COST	UNITS	NUMBER OF UNITS	TOTAL COST	WSRA AMOUNT	LCWUA AMOUNT
TASK 1 - Field Investigations, Designs, Permitting, Bidding						
Engineer	$85.00	HR	160	$13,600.00	$0.00	$13,600.00
TASK 2 - Construction of Outlet Rehabilitation						
Mobilization and Demobilization						
Lowboy with excavator	$135.00	HR	10	$1,350.00		
Lowboy with loader	$135.00	HR	10	$1,350.00		
Pickup with compactor	$75.00	HR	10	$750.00		
Walk-in excavator	$195.00	HR	6	$1,170.00		
Walk-in loader with compactor	$125.00	HR	6	$750.00		
Pickup with trench boxes	$75.00	HR	10	$750.00		
Walk-in trench boxes with loader	$125.00	HR	24	$3,000.00		
Trench Box Rental	$4,000.00	LS	1	$4,000.00		
Daily Travel	$45.00	HR	54	$2,430.00		
ATV	$55.00	DAY	14	$770.00		
Clear and Strip Borrow Area/Haul Road	$195.00	HR	2	$390.00		
Assemble/Disassemble Trench Boxes	$240.00	HR	10	$2,400.00		
Excavate Dam Embankment	$15.00	CY	50	$750.00		
Excavate and Condition Borrow Material	$18.00	CY	50	$900.00		
Haul Borrow Material	$8.00	CY	50	$400.00		
Compact Embankment	$285.00	HR	16	$4,560.00		
Standby for Testing	$45.00	HR	8	$360.00		
Pipe	$1,000.00	LS	1	$1,000.00		
Concrete Encasement	$1,600.00	CY	2	$3,200.00		
Furnish Diaphragm Sand	$1,300.00	LS	1	$1,300.00		
Pipe Replacement	$240.00	HR	9	$2,160.00		
Reclamation, Reseed, Dressing, Cleanup	$1,000.00	LS	1	$1,000.00		
Subtotal TASK 2				$34,740.00	$25,000.00	$9,740.00
TASK 3 Upstream Valve Installation						
Construct Precast Intake Structure	$5,000.00	LS	1	$5,000.00		
Construct Precast Stem Supports	$2,000.00	LS	1	$2,000.00		
Construct Precast Handwheel Block	$3,000.00	LS	1	$3,000.00		
Transport Precast Items	$75.00	HR	6	$450.00		
Walk-in Precast Items	$125.00	HR	6	$750.00		
Gate, Stem and Fittings	$10,000.00	LS	1	$10,000.00		
Gate Installation	$240.00	HR	40	$9,600.00		
Subtotal TASK 3				$30,800.00	$25,000.00	$5,800.00
TASK 4 Construction Inspection, Quality Assurance Testing and Completion Report						
Engineer (Construction Inspection)	$85.00	HR	170	$14,450.00		
Mileage	$0.55	MI	2400	$1,320.00		
ATV	$55.00	DAY	14	$770.00		
Engineer (Completion Report)	$85.00	HR	90	$7,650.00		
Subtotal TASK 4				$24,190.00	$0.00	$24,190.00
Subtotal Estimated Cost				$103,330.00	$50,000.00	$53,330.00
15% Contingency				$15,500.00	$0.00	$15,500.00
TOTAL ESTIMATED COST				$118,830.00	$50,000.00	$68,830.00

PROJECT SCHEDULE

Task	Start Date	Finish Date
1 Field Investigations, Designs, Permitting, Bidding	Summer 2010	Winter 2011
2 Construction of Outlet Rehabilitation	Fall 2011	Within 30 days
3 Upstream Valve Installation	Fall 2011	Within 30 days
4 Construction Inspection, Quality Assurance Testing and Completion Report	Fall 2011	06/30/2012