August 5, 2013

Project: Inundation Mapping for the City of Steamboat Springs

Vendor: City of Steamboat Springs; 137 10th Street, PO Box 775088; Steamboat Springs, CO 80477-5088
Phone: (970) 879-2060
c/o Mr. Jon Snyder

Consultant: RJH Consultants, Inc.; 9800 Mt Pyramid Court, Suite 330; Englewood, CO 80112
Phone: (303) 225-4611
c/o Mr. George Slovensky, P.E.

CWCB funding source: Severance Tax Trust Fund Operational Account

SCOPE OF WORK

RJH Consulting, Inc. (Consultant), at the direction of the City of Steamboat Springs (Vendor), will perform a dam breach modeling study and flood inundation mapping for two dams within the Vendor's system. The studies shall be in accordance with the latest Breach Guidelines published by the Colorado Dam Safety Branch. The level of analysis shall be "Simple," as defined in Table 1 of the Guidelines for both the breach modeling and flood inundation mapping. Flood routing models and inundation mapping shall be based on USGS 10-meter Digital Elevation Model (DEM) or best available topographic mapping.

The two dams to be modeled are at Fish Creek Reservoir and Long Lake. Fish Creek Reservoir is located on the Middle Fork of Fish Creek and Long Lake is located on the mainstem of Fish Creek. The downstream limit of the inundation mapping for both Reservoirs will extend along Fish Creek from the respective dams down to the Yampa River confluence, and further downstream of the Yampa to where breach flood impacts become negligible. Mapping of both reservoirs will terminate at or before the Colorado-Utah state line.

The inundation limits shall be prepared in UTM coordinates (NAD 83, Zone 13 – meters) which shall be overlaid on base mapping that includes color aerial imagery (2011 or newer). The inundation map shall be printed in color on a minimum sheet size of 11"x 17". The inundation extents shall be clearly illustrated and include peak discharge estimates, peak flood wave arrival times and peak flood wave depths at critical locations. Roads, highways and critical infrastructure (schools, hospitals, fire stations, etc.) shall be annotated and any roads expected to be overtopped by the flood wave shall be identified. The map shall include a legend noting the dam, DAMID, north arrow and a graphic scale.

PROPOSED METHODOLOGY

The Consultant shall perform a clear day dam failure analysis of the dam and route the resulting outflow hydrographs downstream using HEC-HMS. Breach parameters shall be estimated in accordance with methodologies recommended by the Office of the State Engineer, Dam Safety Branch. Hydraulic parameters, including width of flow, depth of flow and velocity at critical locations shall be estimated using the Corps of Engineer's HEC-RAS computer modeling software. A steady-state water surface profile resulting from peak flow rates at various locations shall be generated. Topographic information for the floodplains shall be based on USGS 10-meter DEMs from the National Elevation Dataset (NED) elevation data.

It is anticipated that field surveys of critical bridges in the study reach will not be necessary. Correspondence shall be with Dana Miller of the Colorado Division of Water Resources to present preliminary dam breach parameters, water surface profile modeling, and inundation mapping and to determine if field measurements are necessary for critical bridges.

DELIVERABLES

For each reservoir the Vendor shall provide the CWCB the following: a final report for the inundation mapping analysis stamped by a licensed Colorado professional engineer; digital files of the inundation limits, maps and supporting spreadsheets; and hydraulic/hydrologic models.

SCHEDULE

Work may initiate on the date of the State's Purchase Order and delivery of the final product is due no later than June 30, 2014.

BUDGET

The estimated cost for completing the project is $12,500 based on Consultant's current rate schedule and projection of effort. The estimate is summarized in the attached Table(s). The Consultant shall invoice Vendor on a Time and Materials basis for services performed.

PAYMENT

The State shall pay Vendor up to $6,250 for Consultant's project related invoices following receipt of final deliverables. The Vendor is responsible for all expenses in excess of the State's contribution. Any overages or increases in project costs shall be the responsibility of the Vendor.

Estimated Project Cost Sharing:

Owner Match	$ 6,250
CWCB Grant	$ 6,250
TOTAL	$ 12,500

CWCB shall issue payment following receipt and processing of Vendor's Request for Payment submittal. The Request for Payment must include: a summary of Consultant's labor effort and direct costs in accordance with the attached estimate, copies of corresponding invoices from Consultant, and identification of any major issues with proposed or implemented corrective actions. 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 project documentation prior to CWCB issue of payment.