



TRI SAGE CONSULTING
Monthly Report
Carson Truckee Water Conservancy District

February 1, 2016

MONTHLY ACTIVITIES- December 2015 & January 2016

- 1) Monitor Virginia Street Bridge work for Encroachment Permit; document in photo summary report.
- 2) Complete Debris Removal work & monitoring; NDEP Permit Reporting completed.
- 3) Encroachment Permit application and review for City of Reno Sewer Crossing; permit drafted.
- 4) Discuss with Reno potential storm drain project upgrades and permit needs as well as model updates needed for this work.
- 5) Update river model from Booth to upstream of Idlewild Park for upcoming projects.
- 6) Inspect channel encroachment behind Riverfront Condos to Oxbow Park.
- 7) Evaluate options for Interim Risk Reduction Measures for Booth -Riverside reach including modeling benefits and limitations, as well as getting budget level cost estimates.
- 8) Semi-annual river inspection and reporting to the USACE under Martis Agreement.
- 9) Meeting with City of Reno to discuss open issues and additions to Flood Response Plan.
- 10) Martis Creek Agreement Review

UPCOMING ACTIVITIES

- 1) Continue to evaluate temporary flood control measures including cost, storage, installation requirements and options for West Street Plaza and Riverside Drive.
- 2) Work with project proponents for encroachment permit applications for City of Reno Path Upgrades, Storm Drain Addition and NDOT Verdi Bridge Scour Projects.
- 3) Evaluate additional needs for model updates upstream of Keystone Avenue to State Line and downstream of Lake Street to Glendale Bridge; possibly needed for upcoming 408 Encroachment evaluations.
- 4) Run 14,000cfs steady state HEC-RAS flow model to establish water surface elevations along key river locations to evaluate issues; complete sections upstream and downstream of downtown.
- 5) Schedule a meeting and with USACE Flood Control Branch (Spring 2016) regarding inspection issues, West Street Plaza, Riverside matters, 14,000cfs model outcomes and evaluation of channel walls in downtown Reno and appropriate application/confirmation of SWIF process eligibility.
- 6) Continued coordination with City of Reno for 1) Flood Response evaluation and incorporation of Interim Risk Reduction Measures into their Flood Response plan, 2) Flap-gate Installation needs assessment and project and 3) Vegetation Variance for trees along channel- not expected to be necessary due to interim order.

- 7) Draft Vegetation Variance Application for Trees in Vegetation Free Zone if applicable under SWIF; confirm eligibility with USACE.
- 8) Finalize the Equipment Access/Entry Point Documentation and Mapping for the District Jurisdiction;

SUMMARY REPORT

Tri Sage has continued to monitor the work at the Virginia Street Bridge project site for compliance with the encroachment permit. All work in the channel is now completed and all temporary diversion materials, falsework and equipment have been removed from the flow channel. The river bed has been restored to its pre-project condition and elevations. The only work remaining that is associated with the encroachment permit is the completion of the step-down plaza area to restore the 14,000cfs flow channel limits. There is still finishing work being performed on the bridge.

Tri Sage worked with Reno Tahoe Construction to complete the Phase 2 Debris Removal work which was additionally approved by the Board and monitored this work for regulatory reporting. The work proceeded well with the majority of the targeted debris being removed; as few pieces of debris could not be removed due to the increased flows in the river prohibiting access to the debris. Approximately \$15,000 authorized \$25,000 for Phase 2 was spent on this work.

A Sewer Line Crossing project was submitted by the City of Reno and their engineer for an encroachment permit which has been reviewed by the District's engineer as having no permanent impact to the flow channel capacity (removal of materials may actually improve the capacity slightly). It is recommended that Encroachment Permit 16-1 be approved by the Board for this project.

Several projects which will require encroachment permits are in the planning stages at this time including an NDOT project to install bridge pier scour enhancements to four bridges in the Verdi area, a City of Reno Project to upgrade the walking path in Idlewild Park and a City project to install a storm drain inlet into the channel near Dickerson Road. The model in the Idlewild area was updated so that the 14,000cfs flow channel could be identified for these encroachment evaluations. permit submittal requirements have been discussed with each project's proponents.

Tri Sage has inspected the encroachment at Oxbow Park and this encroachment has been broken apart by the higher flows in the river channel which peaked at over 3240 by the Reno Gauge on January 30, 2016; Tri Sage will work with the City of Reno, NDOW and the adjacent Condo Association to minimize this activity from recurring.

Work has been done this month to evaluate the costs and applicability of a few flood barrier options that might be applied along Riverside Drive and the West Street Plaza areas. This includes analyzing the model's predicted water surface elevations with barriers in place based on the barrier's design limitations. This evaluation is ongoing and this information will be the topic of a meeting with the City and TRFMA teams to discuss the options and develop recommendations which can be brought back to the Board.

Tri Sage is working to schedule a meeting between the local parties to discuss a variety of channel matters and then will schedule a follow up meeting with the USACE with the local parties to discuss similar channel matters.

The City of Reno is continuing with their review of the Flap-Gate requirements in order to address the USACE inspection issue; work is progressing well on this project and the City should have information from the study by March.

The following section is repeated from prior reports(*updates in Italics*):

Notably, the USACE has yet to issue their inspection report from April 2013. As a reminder, the USACE criteria for rehabilitation funding and notifications changed late in 2013 such that the CTWCD inspection issues are not subject to loss of the rehabilitation funding nor notification.

Since the May 2014 monthly report, no further discussion has been had with the USACE regarding the determination of “Floodwalls” versus “Channel walls” through the downtown Reno river corridor; however this is an issue that will be pursued for some resolution as it impacts other inspection issues as noted below.

The Status of USACE inspection issues are noted below and the status remains unchanged since July’s Monthly report except for the removal of the Box Culvert at Idlewild Drive and other italicized sections.

- 1) Shoaling- the shoaling deposits identified by USACE have been included in the recent modeling and at the current stage are NOT impacting the 14,000cfs flow. The USACE requested sensitivity analyses have been performed and indicate that doubling the size of the shoaling deposits does NOT push the waters out of the banks in any of the four areas identified during the inspection. The Keystone Avenue Bridge area has been eliminated as a shoaling deposit.
- 2) Flap-gates- *The City of Reno has engaged an engineer to evaluate each penetration relative to the water surface elevation at 14,000cfs through the downtown reach.* Once we have the model updated and run at the reaches upstream and downstream of the downtown areas to produce water surface elevation data, the City of Reno will continue their evaluation on the storm-drain penetrations into the channel. Tri Sage was able to get GIS data for the storm drain locations to correlate to model flow elevations.
- 3) Vegetation- vegetation along the walls and growing from the walls was removed by the City of Reno as part of the 2013 Debris Removal Project; however during the inspection it was noted that vegetation is developing again. *This was too minor to address in 2014 and will be cut back as part of the 2015 project work.* Potential determination of the walls as channel walls, not floodwalls means that there is no “vegetation free zone” requirement and other than the short section that the USACE might determine to be floodwalls, vegetation may become a moot point once specific determination is confirmed.
- 4) *Idlewild Box Culvert/Bank Erosion- the box culvert encroachment was removed in October 2014 and once the flow has an opportunity to re-establish in the unobstructed channel the bank erosion on the Right Bank will be further evaluated if necessary.*

- 5) Flood Response- It appears from the current modeling that the 14,000cfs water surface elevation is below the horizontal surface in all areas downtown except for the West Street Plaza area. There was no approved encroachment by the USACE or the CTWCD for this project including the removal of the walls and railings along this section of river. The USACE has requested that the CTWCD work with the City of Reno to propose Interim Risk Reduction Measures that can be reviewed and approved by the USACE and incorporated into the City's Flood Response Plan. *The City of Reno is working with the potential developer on this matter and will propose temporary measures at a minimum.* It is not clear at this writing what the requirements will be relative to the placement of plywood along the railings and walls as called for in the Martis Creek Agreement now that it is apparent from the modeling that the 14,000cfs flow is below the top of wall and below the horizontal surface in all sections except the West Street Plaza.

Next steps include the evaluation and running of the model in reaches above and below the Keystone to Lake Street areas for the determination of water surface elevations. Discussion with agencies regarding the sections along Riverside Drive Bridge where the water leaves the channel at 14,000cfs and evaluation of mitigation options. The City of Reno is working to address the flap-gate needs as well as the Interim Risk Reduction Measures (IRRM) for the West Street Plaza. Director Penrose and Tri Sage will plan a meeting with the USACE Flood Control Branch in September or October of 2015 to discuss the inspection report and associated issues; this will give time for several items to be addressed including the flap-gates and the IRRM.

RECOMMENDATION

It is recommended that the Board of Directors continue to pursue the inspection/evaluation items as outlined in this report.