



TO: Governance Committee (GC)
FROM: Executive Director's Office (EDO)
RE: Executive Summary – 2020 North Platte Chokepoint Test Flow Report
DATE: September 3, 2020

Executive Summary

The Platte River Recovery Implementation Program (PRRIP or Program) has a Water Plan goal to achieve and maintain a conveyance capacity of at least 3,000 cfs through the North Platte chokepoint—while remaining below flood stage—to facilitate certain water management activities for the benefit of threatened and endangered species downstream. The chokepoint is that reach of the North Platte River extending a few miles on either side of the Highway 83 bridge at the City of North Platte, NE. The term “chokepoint” refers to the significant loss of river flow capacity since the late 1990s owing to extensive encroachment of invasive phragmites, stabilization of sandbars due to vegetation cover, and other factors.

As part of ongoing efforts in pursuit of the 3,000 cfs capacity goal, the Program planned and implemented a test flow release through the North Platte chokepoint in July 2020 using water stored in the Lake McConaughy Environmental Account (EA). This “chokepoint test” had two objectives:

1. Increase minor flood stage for the North Platte River at North Platte. The current minor flood stage stands at 6.0 ft. An increase to 6.5 ft would provide around 800 cfs additional flow capacity below flood stage which would be a great benefit to the Program for future EA releases and other water management activities. The Program sought to use the chokepoint test to collect data and make extensive visual observations that would demonstrate minimal impacts to life or property at river stages at and above 6.0 ft. This information was to be compiled, documented, and submitted to the National Weather Service (NWS) for consideration of the flood stage change. **The desired outcome for this objective was not achieved.**
2. Evaluate the performance of the State Channel Berm. The State Channel Berm, which begins behind the power substation on North River Road and progresses in a general southeasterly direction, was restored by the Program in 2018. By repairing a long-standing breach in the berm, the Program sought to redirect flow back to the main channel of the North Platte River. This was intended to mitigate the effects of flooding in the residential area around North River Road and North Washboard Road that frequently occurred during past high flow events. The chokepoint test offered an opportunity to test the performance of the State Channel Berm under high flow conditions. **The desired outcome for this objective was successfully achieved.**

Planning for the chokepoint test resumed in March 2020 after being postponed due to downstream flooding about a year earlier. A Chokepoint Test Planning Workgroup was convened that grew to encompass a diverse group of Program stakeholders and local officials, including staff from the Program's Executive Director's Office (EDO); the U.S. Fish and Wildlife Service (USFWS) EA Manager and staff; operations personnel from the Central Nebraska Public Power and Irrigation District (CNPPID) and Nebraska Public Power District (NPPD); NWS staff from offices in North Platte and Rapid City as well as the Missouri Basin River Forecast Center; water administration staff from the Nebraska Department of Natural Resources (NDNR); representatives from the City of North Platte; the Lincoln County Emergency Manager; and Program representatives from the U.S. Bureau of Reclamation, Colorado Water Conservation Board, and the Wyoming Water Development Office.



With extensive input from the planning workgroup over a period of three months, the EDO produced an Implementation Plan that covered all elements of the chokepoint test, from specific personnel responsibilities and communications requirements to detailed maps of monitoring locations and the types of data and information to be collected. The Implementation Plan also included the intended schedule for the chokepoint test and identified triggers for termination of the test.

The EA release for chokepoint test officially commenced on July 13, 2020 and ended on July 24, 2020; the total release volume was about 21,000 AF. Daily coordination calls were held, and operational changes were made as needed based on collaborative decision making by the EDO, the EA Manager, and CNPPID. EDO staff conducted on-site monitoring operations in and around North Platte on several days during the test, and NWS staff took photos on most of the days that the river was at or above flood stage. NDNR took multiple site measurements to ensure accurate reporting of the North Platte River discharge associated with stage readings during the chokepoint test.

Extensive observations were made while the North Platte River at North Platte was at or near stage targets of 6.0 ft and 6.5 ft, but planned observations at a stage of 6.75 ft did not happen because the chokepoint test was ended early. Exact stages were difficult to maintain because of both heavy precipitation events downstream of Lake McConaughy and higher than expected transit losses once the river was above flood stage. **Figure ES-1** charts the adjustments to the EA release during the chokepoint test as reflected in the North Platte River near Keystone gage along with stage and discharge observed at the North Platte gage.

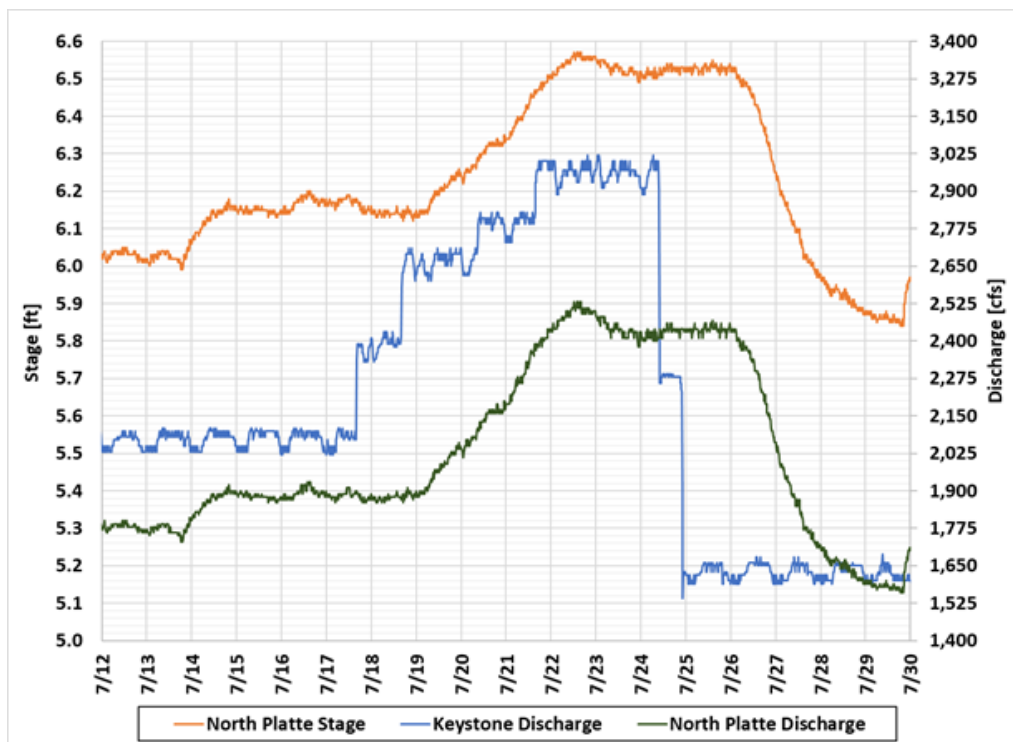


Figure ES-1. Chokepoint Test Stage and Discharge Measurements, July 12-30, 2020.

At the start of the chokepoint test, river stage at North Platte was already hovering around 6.0 ft, as it had been for the previous week. After a slower-than-expected climb, stage reached 6.5 ft late in the evening



on July 21 and peaked at 6.57 ft on July 22 before settling closer to 6.5 ft for a few days. The EA release for the chokepoint test ended on July 24, stage began to drop at North Platte two days later, and a steady decline was observed for several days until rainfall late on July 29 abruptly reversed the downward trend and effectively erased any lingering effects of the chokepoint test.

Low-lying areas of Cody Park, especially at and near the boat ramp, flooded to an extent consistent with expectations. The image on the left side of **Figure ES-2** shows flow in the State Channel, looking downstream with the berm on the left, on July 20 when the average stage for the North Platte River at North Platte was 6.29 ft. In contrast to prior flood events, no standing water of concern was observed anywhere in the area of North River Road and North Washboard Road. This is illustrated by the images on the right side of **Figure ES-2**, both of which show the same location in the southwest quadrant of that intersection when the river was at nearly identical stages during the spring 2011 flood and during the summer 2020 chokepoint test. That the berm appears to have diverted river flows entirely away from an area that experienced significant flooding in the past indicates successful performance of the restored State Channel Berm under high flow conditions.



Figure ES-2. State Channel (left), Land at N. River Rd. & N. Washboard Rd., March 31, 2011, River Stage at 6.30 ft (top right), and Land at N. River Rd. & N. Washboard Rd., July 20, 2020, River Stage at 6.29 ft (bottom right).

High water concerns were reported by owners of riverfront agricultural lands (much of which was accretion ground within the bounds of the historical high banks) far upstream around Sarben as well as



closer to North Platte near the Muskrat Run State Wildlife Management Area. Owners of residential properties along the south bank of the North Platte River in the Vieyra Drive-Red Fox Lane-Darlene Road neighborhood of North Platte reported issues stemming from high river (and groundwater) levels that included water overtopping the banks of backyard ponds, water encroaching to within a few feet a house foundation, septic system problems, inaccessible outbuildings due to soggy ground, and a partially-flooded below-grade storm cellar. **Figure ES-3** shows some of these impacts in photos taken by the EDO and NWS.



Figure ES-3. Observed high water impacts at Red Fox Lane (left) and Darlene Road (right) properties.

The NWS definition¹ for the term “flood categories” acknowledges that “the severity of flooding at a given stage is not necessarily the same at all locations along a river reach due to varying channel/bank characteristics.” Furthermore, “minor flooding” is simply defined as causing “minimal or no property damage, but possibly some public threat (e.g., inundation of roads).” These definitions are qualitative in nature, not based on specific quantitative criteria, which allows a great deal of leeway for local NWS officials to make subjective determinations regarding the severity of observed impacts.

At the peak of the chokepoint test with river stages at or above 6.5 ft, surface water crept to within a few feet of the Albrecht house horizontally, but vertically remained well below the foundation. Problems with underground septic systems and storm cellars are groundwater impacts. However, after site visits to the Red Fox Lane and Darlene Road residential properties on July 23-24, the NWS said during the July 24 daily coordination call that the observed impacts met the criteria for threats to property. NWS declared that there would be no change to minor flood stage for the North Platte River at North Platte, a position that

¹ National Weather Service Manual 10-950, Definitions and General Terminology, November 26, 2019.



119 was formalized in a letter from the NWS North Platte office a few days later. Additionally, NWS quickly
120 revised the flood impacts descriptions to reflect observations made during the chokepoint test. Following
121 the NWS decision on the morning of July 24, the EDO and EA Manager ended the chokepoint test, and
122 CNPPID discontinued the EA release by the end of that day.

123
124 In the absence of additional flow capacity gained through an increase in the minor flood stage, the
125 Program must devise an alternative solution to the problem of the North Platte chokepoint. Options
126 include engineering solutions such as those evaluated by Special Advisor Anderson Consulting during the
127 First Increment (e.g., dredging and construction of jetties to constrict the low-flow channel); bypassing
128 flow around the chokepoint by constructing a dedicated canal or making improvements to existing canals
129 with diversions from the North Platte River and tailwater returns to the South Platte River; buying out
130 properties negatively impacted by high flows on the North Platte River; and modifying the Program
131 Document to allow for flows intentionally exceeding flood stage at North Platte. A final option would be
132 to simply accept the status quo and develop Program water management activities that work within the
133 existing flood stages and discharges for the North Platte River at North Platte. In conjunction with the
134 Adaptive Management Plan update, each of these options should be thoroughly vetted by the EDO and
135 Program advisory committees for consideration by the Governance Committee.