NorthWestern Energy
Delivering a Bright Future

NWE-HEB-3995

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

December 9, 2021

Re: NorthWestern Energy report of a deviation from Project 2188 Article 403 at the Hebgen Development

Dear Secretary Bose:

Project 2188 License Article 403 requires NorthWestern Energy (NorthWestern) to maintain a continuous minimum flow of 150 cfs in the Madison River as measured just downstream from Hebgen Dam at USGS Gauge No 06038500, and a continuous minimum flow of 600 cfs at USGS Gauge No 06038800 at Kirby Ranch. Furthermore, Article 403 requires NorthWestern to limit changes in outflow from Hebgen Dam to no more than 10 percent per day.

Shortly after 02:00, Mountain Standard Time, on November 30, 2021, a gate failure resulted in a reduction of outgoing river flows into the Madison River from Hebgen dam. A coupling on the gate stem failed, which allowed the gate to disconnect from the drive above and fall downward to a more closed position. The gate was originally around 18 inches open and fell to only 6 inches open, which resulted in a decrease in flows. Flows dropped from 648 cfs down to 228 cfs, as measured immediately downstream from Hebgen Dam at USGS Gauge No 06038500.

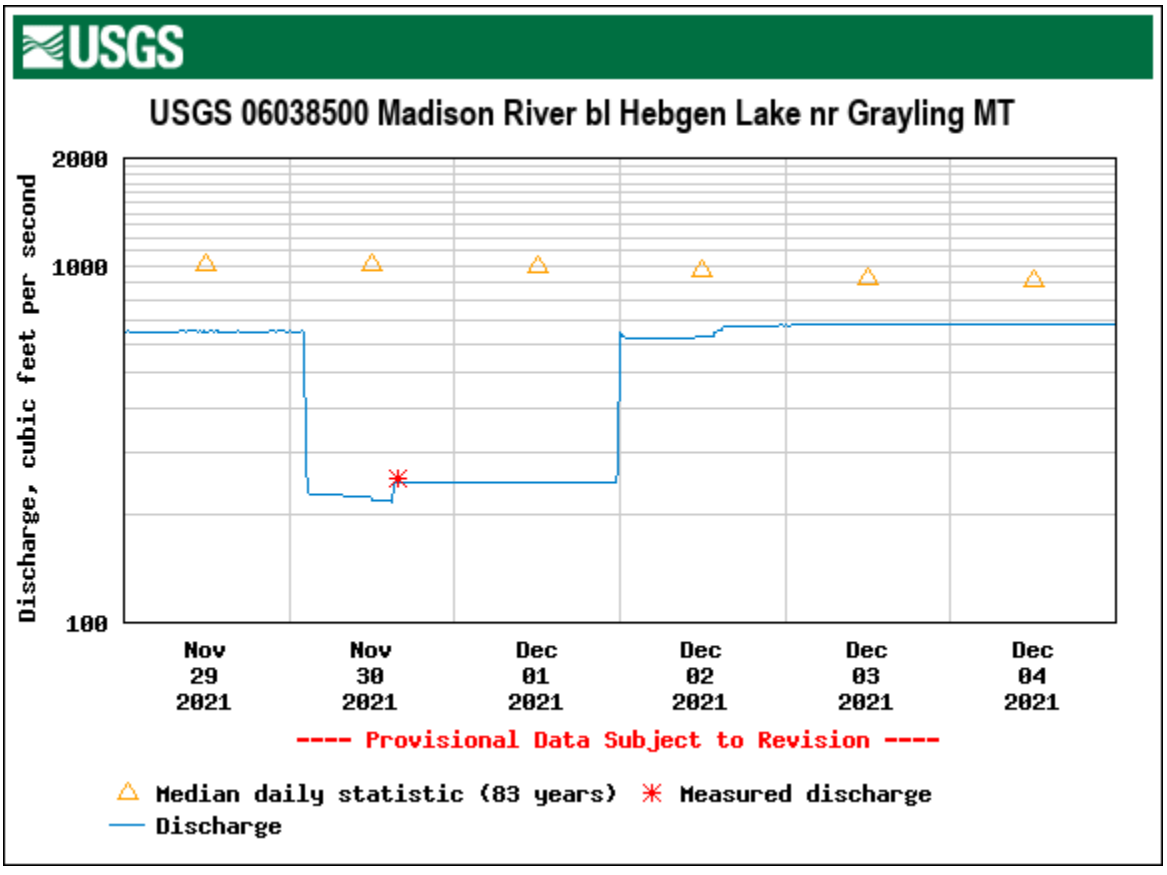
NorthWestern's control system did not identify the failure. The control system showed no change to the gate position or calculated outflow. Gate position and calculated flow instrumentation are located on the gate stem at the deck level. This instrumentation did not indicate any issue as the location of the failure was below the instrumentation and essentially disconnected the gate from monitoring equipment. The USGS Gauge did reflect the lower flows. NorthWestern's first responses were to request USGS to verify proper function of its gauging station and to dispatch personnel to the site to confirm actual conditions. Personnel confirmed the reduced flows.

Onsite testing and troubleshooting led to identification of the failed coupler below the water surface. Once NorthWestern identified the specific failure, an emergency order for a replacement coupling was issued and a repair plan was prepared.[i]

Company and contract support, including divers, mobilized to the site to complete the repair early on December 1st. Divers and crews worked throughout the day to secure the gate and to replace the coupler on the gate stem. NorthWestern completed repairs just before midnight on December 1st and restored flows to pre-event levels.

During the event, the USGS Gauge measured outflow at Hebgen dropped from 648 cfs to 278 cfs within a 15 minute period (a reduction of 57%) and a maximum reduction down to 216 cfs (a reduction of 67%) within a 24-hour period. This change in outflow volume equated to a drop of 0.76 feet of stage (water elevation) in the river. Hebgen outflows, as measured at USGS Gauge No 06038500,remained above the Article 403 minimum of 150 cfs for the duration of the event.

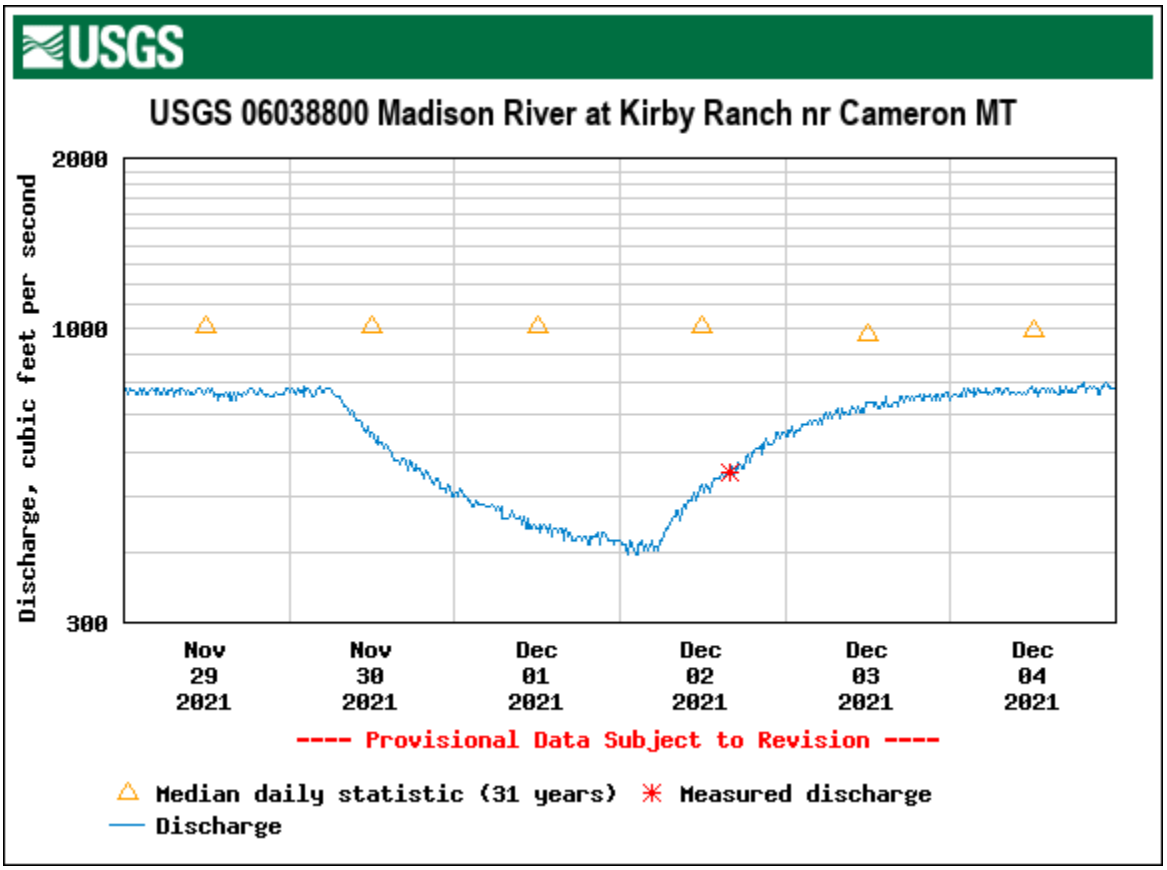
USGS Gauge No 06038500 data below Hebgen Dam is presented below.



During the event, Hebgen outflows ranged from 216 to 248 cfs for approximately 46 hours. Quake Lake, two miles downstream of Hebgen Reservoir, helped to attenuate flow changes in the Madison River downstream resulting in a gradual reduction of flows. Madison River flows dropped below the 600 cfs Article 403 minimum at Kirby Ranch 12 miles downstream at 14:30 on November 30th and reduced slowly to a minimum of 395 cfs at 02:15 on December 2nd. Flows increased at Kirby Ranch after Hebgen outlfows were restored and ample travel time provided

for the water to be conveyed downstream. Flows above 600 cfs were restored in the Madison River at Kirby Ranch at 19:15 on December 2nd.

USGS Gauge No 06038800 data at Kirby Ranch is presented below.



Potential impacts to aquatic resources from the event were most likely concentrated to the Madison River channel below Hebgen Dam and above Quake Lake due to the rapid onset and magnitude of stage change. Areas below Quake Lake, near Kirby Ranch, observed impacts to fish but to a lesser extent, likely due to the lower rate of stage change and magnitude. Throughout the impacted area fish were stranded in isolated shallow areas along channel margins and side channels. Some fish mortality was observed in areas where the affected habitats did not hold adequate water for fish to survive. Other areas, though isolated from the main Madison River channel, still held water in shallow pools. Fish concentrated in these wetted areas and could survive for some extent after the initial drop in flows. An organized volunteer effort supported by local fly shops, Montana Fish, Wildlife, and Parks (MFWP), Trout Unlimited, and NorthWestern targeted these isolated waters. Fish captured in these wetted areas were returned to the main Madison River channel. The salvaged fish were predominately sculpin but also contained juvenile rainbow trout, mountain whitefish and brown trout.

During the time of the event, brown trout had concluded annual spawning and nests of eggs (redds) were in the gravels. Some redds were located in the channel margins and side channel habitats that were cut off from the main Madison River flow. It is unknown whether these eggs dried out and desiccated over the duration of the event.

Severity of impacts to the fishery is currently unknown and may not be known for several years. NorthWestern is committed to working with the resource agencies to determine appropriate studies to evaluate impacts over time to the Madison River fishery. Additionally, NorthWestern will continue to implement Five-Year Madison River Fisheries Protection, Mitigation, and Enhancement Plans pursuant to Articles 408, 409, 412, 414, 416, and 417 FERC approved on April 29, 2019.

NorthWestern will conduct a thorough investigation, including a root cause analysis, to fully understand the failure, NorthWestern's response, and to identify corrective actions to prevent recurrence of the failure mode and to ensure improved notification of a rapid drop in river flows.

NorthWestern notified and was in frequent communication and coordination with MFWP and the US Forest Service during and in response to the event.

Sincerely,

Mary Gail Sullivan

Director, Environmental and Lands

CC:
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[i] In addition, the spillway gates were opened to initiate more flow into the river. With the low reservoir elevation only about 20 cfs could be added from the spillway.

Document Content(s)