

**MEMORANDUM FOR THE RECORD – 16 MCN 018 MFR McNary Side Brush**

**SUBJECT:** The side dewatering screen brush at the McNary Juvenile Collection Channel has had repeated issues over the last few years, especially during the fall and winter months. Problems with the brush again began this year on November 13. Please see Table 1 below for details.

**Table 1. Side Screen Brush Issues.**

<u>Date</u>	<u>Time</u>	<u>Issue</u>	<u>Result</u>
Nov 13	1540 hours.	Side brush alarm.	Operator reset.
Nov 14	0200 hours.	Side brush alarm.	Operator reset.
Nov 14	About 0800 to 1000 hours.	Previous alarms.	Mechanics examined and tighten clutch.
Nov 16 to 17	1806 to about 1000 hours.	Side brush alarm. Taken out of service. Channel monitored.	Mechanics and electrical examined. No problem found.
Nov 17	About 1100 hours.	Sett brush to run when staff is present.	Set brush cycle to 8 hours.
Nov 17 to 24	Daily.	None.	Cycle setting and monitoring helped.
Nov 24	0200 hours.	Side brush alarm.	Operator reset.
Nov 25	0042 hours.	Side brush alarm.	Operator reset.
Nov 25	1630 hours.	Side brush alarm.	Operator reset.
Nov 26	0050 hours.	Side brush alarm.	Operator reset.
Nov 27	0030 to 0830 hours.	Brush off.	Monitor channel.
Nov 27	0830 hours.	Brush stalled.	Biologist manually completed cycle.
Nov 27	1630 hours.	Brush stalled.	Biologist manually completed cycle.
Nov 28	0030 to 0830 hours.	Brush off.	Monitor channel.
Nov 28	0715 hours.	Brush stalled 3 times in 2 cycles.	Brush completed cycles.
Nov 28	0830 hours.	Side brush alarm.	Biologist reset. Mechanics examined.
Nov 28	About 1030 hours.	Side brush alarm.	After drive chain was adjusted.

From November 13 to 17, the side screen brush triggered alarms three times. The mechanics adjusted the clutch and the brush was examined. The brush cycle interval was increased to 8 hours. Channel monitoring was also increased. The brush successfully operated for one week without incident.

Over the Thanksgiving weekend, the brush stalled in 6 out of 11 cycles. The brush was reset each time and monitoring continued.

On November 28, the last attempt to fix any accessible above water issues was not successful. At about 1100 hours, facility staff determined that the channel would have to be dewatered to access and examine the brush more closely.

The two side dewatering valves behind the affected screen complicated the cleaning brush issue. The two valves drain the water that passes through the side screen. As in previous years, the south side dewatering valve began to jam on occasion when operating at lower settings. During the past two seasons the valve jammed at 20 inches of stem length. On November 18, the same valve jammed at 25 inches of stem length. In an attempt to avoid additional jams, the west floor valve was closed 1 inch. This was an attempt to place the side valve in an operating range in which jamming would not occur as forebay elevations changed.

Unfortunately, for the second year in a row, the north side dewatering valve began to stick and pop open (also known as "popping") when at about 31 to 33 inches open. In 2015, this valve "popped" at 37 inches open. This "popping" has occasionally occurred all year.

Both valves were examined during past winter outages and no problems were found. This winter, this situation needs to be resolved as the operation range in which there aren't difficulties with either the north or south side dewatering valve is becoming more limited. A higher operation range means more water passes through the side screen, which now has an unreliable cleaning brush. In addition, there are no personnel available this late in the season to monitor the side valves during the swing shift. The side dewatering valves and the cleaning brush are critical components in keeping the side screen clean and maintaining the proper channel elevation. Failure of these components may lead to fish loss.

For these reasons, from approximately 0730 to 1015 hours on November 29, the juvenile collection channel was switched from primary bypass mode to emergency bypass mode. The system will remain in emergency bypass until all ESBSs are removed. The 2016 fish Passage Plan states on page MCN-16 the following:

**2.3.3.8.(ii). Late Season Mechanical Failure.** After November 30, if a mechanical failure forces the McNary JFF juvenile channel into emergency bypass mode, the McNary Fisheries staff may leave the juvenile channel in emergency bypass mode until the beginning of winter maintenance when the channel is fully dewatered.

The switching occurred two days before this deadline for mechanical failure. However, preparations are also in progress for an early Washington shore ladder outage to begin on December 1. To safely salvage fish from the juvenile fishway and the ladder, this time table was the most practical under the circumstances.

The side brush was operated at 1630 hours on November 28 and again on November 29 at 0700 hours, just before the switch to emergency bypass. Following the switching operation, the side screen was found somewhat obstructed with debris as seen in the attached photos. The screen should not have been this dirty and it appears the brush was not making full contact with the screen. It is fortunate that this switch to emergency bypass occurred before the situation became worse.

Emergency bypass does not allow for PIT tag detection. There have been no studies of this passage route.

Below is a description of the fish seen during the change in fishway configuration. These fish were observed when crowded upstream of the bulkheads in 2.5 feet of water. No accurate counts were possible.

- A. Species – Approximately 25 adult fall Chinook and steelhead total. This is about  $\frac{1}{4}$  to  $\frac{1}{2}$  of the number of adults typically seen in previous years. No smolts were observed, which is unusual. No lamprey were observed. Non-salmonid observations included one walleye, several small mouth bass, a couple of channel catfish and two sturgeon about 4 feet long along with several juvenile shad.
- B. Origin – unknown.
- C. Length – unknown.
- D. Marks and tags – unknown.
- E. Marks and Injuries found on carcass – No carcass. No mortalities were observed.
- F. Cause and Time of Death – Not Applicable.
- G. Future and Preventative Measures – This winter all efforts will be made to resolve the issues with the side brush and dewatering valves. Two extra weeks are available to work on these issues. During the winter of 2016 or 2017, a contractor will replace the side brush and/or other systems but the valve are not on this contract.

Figure 1. View of obscured side dewatering screen from floor of the Juvenile Collection Channel at McNary Dam on November 29, 2016.



Figure 2. View of obscured side dewatering screen from access walkway, Juvenile Collection Channel at McNary Dam on November 29, 2016.



Sincerely,

Bobby Johnson  
Project Fish Biologist, McNary Dam  
Phone: (541)-922-2212  
Email: [bobby.johnson@usace.army.mil](mailto:bobby.johnson@usace.army.mil)