

**U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#38-2019**

Project: McNary

Biologist: Bobby Johnson and Denise Griffith

Dates: November 15 to 21, 2019

Turbine Operation

Yes	No	Turbine Unit Status	Hard	Soft
	X	All 14 turbine units available for service. (See table & comments below for details).		
	X	Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Table 1. McNary Unit Outages (OOS) and Return to Service (RTS).

Unit(s)	OOS		RTS		Outage Description
	Date	Time	Date	Time	
5	05/23	0943	01/09/20	NA	Turbine blade packing.
14	08/19	1221	01/02/20	NA	Thrust bearing.
8	10/31	0924	11/27	NA	Thrust bearing inspection.
13	06/10	0610	11/21	0905	Thrust bearing.
1 to 3	11/19	1002	11/19	1119	ESBS camera inspections, rotated through units.

Comments: All return to service dates are subject to change. The soft one percent peak efficiency constraint continued. At times, units ran outside the constraint at BPA's request.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on November 15, 17 and 20.

Fish Ladder Exits:

Yes	No	Location	Criteria	Comments
X		Oregon Exit	Head over weir 1.0' to 1.3'	
X		Oregon Count Station Differential	0.0' to 0.5'	
X		Washington Exit	Head over weir 1.0' to 1.3'	
X		Washington Count Station Differential	0.0' to 0.5'	

Comments: Debris loads were minimal to light near the Oregon exit and minimal to very light near the Washington exit.

There are no problems to report.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
X			North Oregon Entrance Head Differential	1.0' – 2.0'	
X			NFEW2 Weir Depth	≥ 8.0'	
X			NFEW3 Weir Depth	≥ 8.0'	
X			South Oregon Entrance Head Differential	1.0' – 2.0'	
X			SFEW1 Weir Depth	≥ 8.0'	
	X*		SFEW2 Weir Depth	≥ 8.0'	Nov 17 and 20, see below.
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 1.8 fps.
X			Washington Entrance Head Differential	1.0' – 2.0'	
X*			WFE2 Weir Depth	≥ 8.0'	
	X*		WFE3 Weir Depth	≥ 8.0'	6.6' on Nov 20.

*Comments: The out of criteria points listed above for the Oregon ladder entrance weir SFEW2 were due to the weir jamming high, which resulted in the weir cables being slack. Accurate weir elevation readings could not be obtained but it can easily be assumed the weir was out of criteria. Slack cables were also observed on November 21. Each time, the operators resolved the issue. SFEW2 may have to be switched to manual mode if this problem persists.

The out of criteria points listed above for the Washington ladder entrance weir W3 were due to weir W2 jamming again on November 16. The operators once more switched the weir to manual mode. The elevation readings for W2 were suspect on November 15 and 17. However, the location of the cable joints would indicate the weir was in criteria. The general maintenance staff examined W2 on November 18. The weir was freed but then again jammed. The weir will remain in manual mode and be examined again on November 25. In order to maintain the pool differential, the control system will raise W3 out of criteria at times.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
		Yes*	WA shore Wasco County PUD Turbine Unit
Yes*			WA shore Wasco PUD Bypass
		Yes	Oregon shore Fish Pump 1, OOS to December 31.
Yes*			Oregon shore Fish Pump 2, Blade angle: 23 to 24°
Yes*			Oregon shore Fish Pump 3, Blade angle: 26 to 27°
Yes			OR North Powerhouse Pool supply from juvenile fishway

*Comments: As mention last week, the Wasco County PUD unit tripped off line from November 14 at 2322 hours to November 15 at 0014 hours. The next outage began when the PUD unit was removed from operation on November 20 at 0748 hours. The hydraulic system to conduit 3 isolation/bypass gate failed and released 18.7 gallons of fluid. The fluid was recovered. However, the unit cannot return to service until the gate hydraulic seals on conduit 3 are replaced. Returning unit to service now would result in the release of more fluid. These repairs cannot occur until the ladder is dewatered during the winter maintenance season. PUD personnel will most likely ask for an early start to the winter outage. The bypass system has been functioning satisfactorily.

When the operators have to reset SFEW2, they must briefly reduce the blade angles on fish pumps 2 and 3 to zero degrees. This usually occurs in the afternoon.

Juvenile Fish Passage Facility

The juvenile system remains in primary bypass for the fall season. Light maintenance and preparations for the winter outage continued at the facility. The full flow flume adult flush line valve remained partially closed.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Powerhouse forebay debris load acceptable?	Very light to moderate.
X			Trash rack differentials measured this week?	Daily.
X			Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: Debris was a mixture of aquatic vegetation and woody material. New incoming debris was minimal. The spillway debris load would be described as minimal. Much of the debris moved between the powerhouse and the Oregon shoreline, which is causing the debris to dissipate.

There are no problems to report.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs):

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
X			ESBSs inspected this week?
X			ESBSs inspection results acceptable?
X			VBSs differentials checked this week?
X			VBSs differentials acceptable?

Comments: The brush cycles for the screens in units 6, 8, 10 and 13 remained in timer mode. Camera inspections in units 1 through 3 revealed no problems.

Daily VBS differential monitoring continued. No high differentials were recorded this week. A total of two screens were cleaned on November 20 and 21.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe:

Yes	No	NA	Item	Number of orifices in service
X			Orifices operating satisfactory?	42
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: Orifices were operated as required for VBS cleaning. Orifice valve operators were repaired as needed.

Due to low debris loads, the cleaning brushes cycle time was increased from every 3 hours to every 5 hours on November 17. There are no problems to report.

Bypass Facility:

Yes	No	NA	Item
		X	Sample gates on?
		X	PIT-tag sampling system on?

Comments: During the fall primary bypass season, all systems remain out of service with light maintenance ongoing.

The separator remained dewatered for inspection. The paint will again be tested for lead and other elements. The test report should arrive next week. After which, the process needed to clean the separator will be determined and proceed. Next, measures of the wall and floor thickness will occur. Finally, a path forward for rehabilitation will be determined.

TSW Operations:

The TSW in spillbay 19 remained closed for the season. The TSW in bay 20 was operated per the adult steelhead top spillway weir (TSW) passage efficiency study plan. The fall phase of the study concluded on the night of November 15. The TSW in bay 20 will remain closed at this time.

River Conditions

Table 2. River Conditions at McNary Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
120.6	105.3	1.8	0.0	51.0	51.0	6.0	6.0

Comments: The above data is from the control room. The spill recorded was due to the TSW passage study.

Other

Inline Cooling Water Strainers: The next cooling water strainer inspections will occur on December 3.

Avian Activity: Casual avian observations continued. Bird numbers appear to be fluctuating with their migration and the juvenile shad out migration. Overall, gull and cormorant numbers appear to be slowly declining. There appears to be more roosting activity than feeding.

Gull activity fluctuated in the powerhouse zone with birds feeding and roosting.

In the spill zone, gull and cormorant numbers again fluctuated. No pelicans or terns were observed this week. All birds were feeding or roosting. Feeding was higher when the TSW was open. Much fewer gulls and cormorants roosted on the top of the navigation lock and Washington ladder walls. Adult and juvenile birds were observed.

In the bypass outfall zone, the gulls and cormorants were mostly roosting on the full flow pipe. However, at times, a fair numbers of these birds were noted feeding.

The laser for bypass outfall hazing remained in place. The laser did appear to be fairly effective on the wing wall. The outfall programming has not yet been verified. Thus, bird counts remained fairly high near the outfall. Though, bird numbers were down somewhat. At this point, further evaluation of laser technology will resume next spring.

In the forebay zone, an occasional gull flock, grebe or cormorant was observed. Fluctuating numbers of gulls and cormorants were noted roosting outside the zone along the Washington shore line. Large gull flocks were still observed around the project. A loon and great blue heron was also noted.

Invasive Species: The next mussel station examinations will occur on November 24.

Fish Rescue/Salvage: No fish rescue occurred this week.

Research: The University of Idaho completed removing their equipment for the adult lamprey passage study on November 20.

The fall phase of the adult steelhead top spillway weir (TSW) passage efficiency study concluded on the night of November 15. The two cameras deployed near the TSW were removed on November 20. A dive to repair/replace the cable on the trash rack in 1B slot is scheduled to occur on December 10. The equipment on the ESBSs will be removed on December 16.

Project: Ice Harbor

Biologist: Ken Fone

Dates: November 15 – November 21, 2019

Turbine Operation

Yes	No	Turbine Unit Status	Hard	Soft
	x	All 6 turbine units available for service (see table & comments below for details).		
x		Available turbines operated within 1% peak efficiency? Constraint in effect.		x

Ice Harbor Unit Outages (OOS) and Return to Service (RTS):

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind
6	8/14/19	0743	11/21/19	1109	Annual maintenance and overhaul
5	10/15/19	0741	---	---	Install new head gate cylinder in 5A. Also annual maintenance.

Comments: None.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on November 19, 20, and 21.

Fish Ladders:

Yes	No	Location	Criteria	Measurements
x		North Ladder Exit Differential	Head \leq 0.3'	
x		North Ladder Picketed Lead Differential	Head \leq 0.3'	
x		North Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	
x		South Ladder Exit Differential	Head \leq 0.3'	
x		South Ladder Picketed Lead Differential	Head \leq 0.3'	
x		South Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
		x	South Shore Entrance (SFE-1) Weir Depth	\geq 8.0' or on sill	
	x		South Shore Channel/Tailwater Differential	1.0' – 2.0'	2.2', 2.3'
x			South Shore Channel Velocity	1.5 – 4.0 fps	
		x	North Powerhouse Entrance (NFE-1) Weir Depth	\geq 8.0' or on sill	
x			North Powerhouse Entrance Channel/Tailwater Differential	1.0' – 2.0'	
		x	North Shore Entrance (NEW-2) Weir Depth	\geq 8.0' or on sill	
	x		North Shore Channel/Tailwater Differential	1.0' – 2.0'	2.3, 2.2'

Comments: The north shore and south shore entrance channel/tailwater head differentials were above criteria on the inspections on November 20 and 21, when the tailwater elevation was low. The November 19 inspection showed the entrance head differentials being in criteria when the tailwater was higher. The north and south shore fish ladders normally have two and at least six AWS pumps running, respectively, to meet entrance criteria. Shutting off an additional pump at each location may result in the head differentials being too low, especially when the tailwater increases.

Auxiliary Water Supply (AWS) System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
6 pumps	2 pumps		Status of the 8 South Shore AWS Pumps
2 pumps	1 pump		Status of the 3 North Shore AWS Pumps

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
x			Forebay debris load acceptable? (amount)	Average of 35 square yards
x			Gatewell drawdown measured this week?	
x			Gatewell drawdown acceptable	
x			Any debris seen in gatewells (% coverage)	0-5%
	x		Any oil seen in gatewells?	

Comments: None.

STSS/VBSs:

Yes	No	NA	Item
	x		STSSs deployed in all slots and in service?
	x		STSSs in continuous-run mode (Note: if not, then STSSs are in cycle-run mode)? In cycle-run.
	x		STSSs inspected this week?
		x	STSSs inspection results acceptable?
		x	VBSs differentials checked this week?
		x	VBSs differentials acceptable?

Comments: None,

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
x			Orifices operating satisfactory?	20
x			Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Juvenile Fish Facility: The fish facility is being operated in primary bypass.

Fish Sampling: Sampling is ended for the year.

Removable Spillway Weir (RSW): Voluntary spill for fish passage is ended for the year.

River Conditions

River conditions at Ice Harbor Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
27.8	11.0	0	0	50	49	9.3	7.9

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Monthly strainer inspections for lamprey ended in June and will start again in December. Unit 1, 2, and 4 strainers were cleaned on November 16 and 21, because of higher water pressure differentials across the strainers. A total of approximately 2,576 juvenile shad mortalities were found.

Avian Activity: There were high numbers of gulls and pelicans observed around the project. The birds were observed to be foraging downstream of the powerhouse.

Invasive Species: No new exotic species have been found.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by Anchor, frozen and properly disposed of in a landfill. Sampling is done for the year.

Fish Rescue/Salvage: Unit 6 tailrace stoplogs were removed on November 19, in preparation for returning the unit to service. Fish facility personnel recovered 1 channel catfish, 1 smallmouth bass, and 12 crayfish from the ribbing of the stoplogs, and released them to the river in good condition. An estimated 70 Siberian prawns were on the stoplogs, but most of them could not be recovered because of the difficulty in seeing, accessing, and handling them.

Research: None.

Project: Lower Monumental

Biologists: Chuck Barnes and Raymond Addis

Dates: November 15 - 21, 2019

Turbine Operation

Yes	No	Turbine Unit Status	Hard	Soft
	X	All 6 turbine units available for service (see table & comments below for details).		
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Lower Monumental Unit Outages (OOS) and Return to Service (RTS)

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
Unit 2	7/15/2019	07:20	2/28/2020	ERTS	Annual Maintenance/Draft Tube Liner Repair
Unit 4	10/09/2019	16:05	12/12/2019	ERTS	Governor Control
Unit 5	10/03/2019	15:50	1/23/2020	ERTS	Governor Control
Unit 6	8/05/2019	12:20	11/25/2019	ERTS	6 Year maintenance/Blade Seal Replacement

Comments: Units went into Hard Restraint at 0001 on April 1.

Adult Fish Passage Facility

The adult fishways were inspected by USACE biologists on November 18, 19 and 20.

Fish Ladder:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head \leq 0.5'	
X		North Ladder Picketed Lead Differential	Head \leq 0.4'	
X		North Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	
X		South Ladder Exit Differential	Head \leq 0.5'	
X		South Ladder Picketed Lead Differential	Head \leq 0.3'	
X		South Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	

Comments.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Shore Entrance (NSE-1) Weir Depth	\geq 8.0' or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	\geq 8.0' or on sill	
X			North Shore Channel/Tailwater Differential	1.0'–2.0'	
		X	South Powerhouse Entrance (SPE-1) Weir Depth	\geq 8.0' or on sill	
		X	South Powerhouse Entrance (SPE-2) Weir Depth	\geq 8.0' or on sill	
X			South Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	
		X	South Shore Entrance (SSE-1) Weir Depth	\geq 8.0'	
X			South Shore Entrance (SSE-2) Weir Depth	\geq 6.0'	
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	

Comments: South Powerhouse Entrance weir (SPE-1) was on sill during all inspections with readings of 7.4, 7.2 and 7.0 feet respectively.

South Powerhouse Entrance weir (SPE-2) was on sill during all inspections with readings of 7.4, 7.2 and 7.0 feet respectively.

South Shore Entrance weir (SSE-1) was on sill during all inspections with readings of 8.4, 8.0 and 7.9 feet respectively.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
Yes			AWS Fish Pump 1
Yes			AWS Fish Pump 2
Yes			AWS Fish Pump 3

Comments:

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	363 yd ²
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 – 25 %
	X		Any oil seen in gatewells?	

Comments:

STSs/VBSs:

Yes	No	NA	Item
X			STSs deployed in all slots and in service?
	X		STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)?
	X		STSs inspected this week?
		X	STSs inspection results acceptable?
		X	VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments: STS's were operating in Cycle mode due to average sub-yearling Chinook and sockeye lengths being greater than 120 mm.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	17
	X		Dewaterer and cleaning systems operating satisfactory?	

Comments:

Collection Facility: The facility was dewatered at 1200 on October 3 for cleaning and winter maintenance.

Transport Summary: Transport season ended on September 30.

Spillway Weir: There was no spill during this reporting period.

River Conditions

River conditions at Lower Monumental Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (°F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
26.6	13.1	0.0	0.0	48.5	48.0	5.7	5.1

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were not checked during this reporting period.

Avian Activity: Tailrace counts of foraging piscivorous birds at Lower Monumental Dam.

Gulls and cormorants were the predominant piscivorous bird species observed during fish ladder inspections this week.

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
11/18/2019	08:30	12	6	0	0	0
11/19/2019	09:40	55	0	0	0	0
11/20/2019	09:30	4	0	0	0	0

* Table shows tailrace observation conducted during Adult Fish Ladder inspections

Comments: Bird hazing efforts by USDA personnel ended at the end of the working day on June 2. Daily bird hazing effectiveness tailrace observations ended with the June 30 observation.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on November 18.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by PSMFC and Anchor, frozen and properly disposed of in a landfill. Juvenile fish collection ended at 0700 on September 30.

Date	Sample (euthanized)	Collection*
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*Collection and sample numbers are the same as the facility when sampling at 100%

Fish Rescue/Salvage: No Fish Rescue/Salvage took place during this reporting period.

Research: No Research took place during this reporting period.

Project: Little Goose

Biologists: Scott St. John and Richard Weis

Dates: November 15-21, 2019

Turbine Operation

Yes	No	Turbine Unit Status	Hard	Soft
	X	All 6 turbine units available for service (see table & comments below for details).		
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Little Goose Unit Outages (OOS) and Return to Service (RTS)

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
5	04/21/17	00:54	03/31/21	17:00	Spider and Upper Guide Bearing Repair
2	10/07/19	07:15	11/23/19	17:00	Unit Annual, VBS/ESBS Inspection

Comments:

Adult Fish Passage Facility

Little Goose fish facility staff inspected the adult fishway on November 18, 19 and 20.

Fish Ladder:

Yes	No	NA	Location	Criteria	Measurements
X			Fish Ladder Exit Differential	Head \leq 0.5'	
X			Fish Ladder Picketed Lead Differential	Head \leq 0.3'	
X			Fish Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	0.8
X			Fish Ladder Cooling Water Pump in Service		
		X	Fish Ladder Exit Cooling Water Pump Operating Satisfactorily		

Comments: Cooling water pumps was shut off for the season on September 23.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurement
X			South Shore Entrance (SSE-1) Weir Depth	\geq 8.0'	
X			South Shore Entrance (SSE-2) Weir Depth	\geq 8.0'	
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	\geq 7.0' or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	\geq 7.0' or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	
X			North Shore Entrance (NSE-1) Weir Depth	\geq 6.0' or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	\geq 6.0' or on sill	
X			North Shore Channel/Tailwater Differential	1.0'–2.0'	
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	1.4

Comments: On November 18 and 19 surface velocity at the south shore junction pool was found at 1.4 fps.

Subsurface water velocity was measured near NPE on October 27 using a Rickly velocity meter and averaged 2.7 feet per second.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
X			AWS Fish Pump 1
X			AWS Fish Pump 2
X			AWS Fish Pump 3

Comments:

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comment
X			Forebay debris load acceptable? (amount)	
	X		Trash rack differentials measured this week?	
		X	Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: There is approximately 8,000 square feet of floating woody debris inside the trash shear boom in the immediate forebay.

ESBS/VBS:

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
	X		ESBSs inspected this week?
		X	ESBSs inspection results acceptable?
	X		VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments: ESBS/VBS underwater camera inspections were conducted on Unit 2 on October 10 and 11. The inspection found a VBS fastener bar in gatewell 2B partially dislodged. Powerhouse maintenance crews currently have gatewell 2A dewatered for fastener upgrades and will repair the fastener in gatewell 2B during the current annual maintenance outage. VBS screens in gatewell 2B were pulled and replaced with new over the weekend of November 23. Some small holes were found. No fish were seen when gatewell was drained on either side of the VBS screen.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	18
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Collection Facility: The juvenile bypass system is currently operating in primary bypass, with the Juvenile Fish Facility dewatered for winter maintenance.

Transport Summary: Daily collection and transport ended on November 01 at 07:00.

Spillway Weir: The adjustable spillway weir (ASW) was closed on July 23 at 15:17 per the guidance outlined in the Columbia Basin Teletype (CBT). The ASW will remain closed for the season.

River Conditions

River conditions at Little Goose Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
25.8	12.7	0.0	0.0	47.5	46.8	5.7	5.4

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were last inspected on July 3 with no lamprey being observed. Inspections will resume in December per the Fish Passage Plan.

Avian Activity: Daily Piscivorous bird counts at Little Goose Dam ended on October 31 for the 2019 season.

Invasive Species: No zebra or Quagga mussels were observed.

Siberian Prawn: None.

Gas Bubble Trauma (GBT): The last gas bubble monitoring occurred on July 15.

Fish Rescue/Salvage: None.

Research: N/A

Project: Lower Granite

Biologists: Elizabeth Holdren and David Miller

Dates: November 15-21, 2019

Turbine Operation

Yes	No	Turbine Unit Status	Hard	Soft
	X	All 6 turbine units available for service (see table & comments below for details).		
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Lower Granite Unit Outages (OOS) and Return to Service (RTS)

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
Unit 2	11/04	0800			Overhaul

Comments:

Adult Fish Passage Facility

Lower Granite Corps biologist's and Anchor Environmental biologist's inspected the adult fish ladder November 8, 19, 20, and 21.

Fish Ladder:

Yes	No	NA	Location	Criteria	Comments
X			Fish Ladder Exit Differential	Head \leq 0.5'	
X			Fish Ladder Picketed Lead Differential	Head \leq 0.3'	
X			Fish Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	
		X	Fish Ladder Cooling Water Pumps in Service		
		X	Fish Ladder Cooling Water Pumps Operating Satisfactorily		

Comments:

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
X			South Shore Entrance (SSE-1) Weir Depth	\geq 8.0'	
X			South Shore Entrance (SSE-2) Weir Depth	\geq 8.0'	
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	\geq 8.0' or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	\geq 8.0' or on sill	
	X		North Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	
X			North Shore Entrance (NSE-1) Weir Depth	\geq 7.0' or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	\geq 7.0' or on sill	Closed
X			North Shore Channel/Tailwater Differential	1.0'–2.0'	0.9'
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	0.8, 0.9, 1.0

Comments: Since May 4 the fish ladder control system screen and local reading for the south shore channel/tailwater and depth over the SSEs have been inconsistent. SSE gates remain in local operation until Operation and District engineering can resolve the control system issues. SSEs out of criteria readings were due to the gated inability to adjust to changing tailwater. SSEs were raised in response to NSE head differential out of criteria reading November 20.

NPE channel velocity sensor readings have consistently read below 1.5 fps. Surface velocity is being verified using tape measure and stopwatch and found to be in criteria. Velocities have been reading below 1.5 fps at both north powerhouse and north shore sensors. Biologists, operators, and District engineers are working to resolve fish ladder velocity issues and control system issues.

Auxiliary Water Supply System:

Operating Satisfactorily	Standby	Out of Service	Auxiliary Water Supply (AWS)
Yes			AWS Fish Pump 1
	Yes		AWS Fish Pump 2
Yes			AWS Fish Pump 3

Comments:

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	
X			Trash rack differentials measured this week?	
X			Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments:

ESBSs/VBSs:

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
	X		ESBSs inspected this week?
		X	ESBSs inspection results acceptable?
	X		VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments:

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	18
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: The collection channel is operating with primarily 14" orifices with 10" orifices opened to maintain optimal flume flow in response to forebay elevation. The north makeup water valve remains in local control due to an automatic control motor hardware failure. Intermittent issues with local and remote operation of orifices for back flushing continue to be observed. Problems are reported to operations when they are identified. Orifices 2BN and 5AN are inoperable due to failed solenoids. Attempting to operate these orifices results in a blown the fuse in the panel.

Collection Facility: Dewatered for winter maintenance.

Transport Summary: N/A

Spillway Weir: No spill

River Conditions

River conditions at Lower Granite Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
20.6	16.5	0	0	46.0	44.4	5.0+	5.0+

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers:

Invasive Species: No signs of Zebra/Quagga mussels were found on submerged substrates.

Avian Activity: N/A

Gas Bubble Trauma (GBT) Monitoring: N/A

Adult Fish Trap Operations: Adult trap was dewatered for winter maintenance November 18. The supply line from the PDW was dry tested and successfully operated November 19.

Fish Rescue/Salvage: A fish rescue was performed at the adult trap November 18. Recovered live fish included 1 Coho, 1 unclipped steelhead, and 1 unclipped juvenile Chinook. Mortalities included 7 unclipped and 1 clipped adult Chinook, 1 Coho, and 2 unclipped steelhead. All were in various stages of decomposition.