

**U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#43-2019**

Project: McNary

Biologist: Bobby Johnson and Denise Griffith

Dates: December 20 to 26, 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	02/13/20	NA	Turbine blade packing.
2 & 3	12/20	0710	12/20	1142	ESBS's raised.

Comments: All return to service dates are subject to change.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on December 21, 22 and 23.

The Washington shore ladder remains out of service. Dewatering the entrance pool has not yet occurred. From above, diffusers 3 through 12 appeared in satisfactory condition on December 22. The upstream duplex PIT tag antenna was removed on December 23. Also, other winter maintenance has begun including the counts station window brushes. The Washington shore ladder is scheduled to return to service on January 16.

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'	

Comments: The debris load was very light near the Oregon exit. After alarming, exit weir 338 were reset on December 21.

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'	7.0' all week.
	X		NFEW3 Weir Depth	≥ 8.0'	7.0 to 7.1' all week.
X			South Oregon Entrance Head Differential	1.0' – 2.0'	
X			SFEW1 Weir Depth	≥ 8.0'	
X			SFEW2 Weir Depth	≥ 8.0'	
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 2.3 fps.

Comments: The out of criteria points listed above for the Oregon ladder entrance weirs NFEW2 and NFEW3 were due to the juvenile system no longer supplying flow to the Oregon north powerhouse pool. Also, NFEW1, which is not in service, was found in automatic mode on December 22 and immediately returned to manual mode.

Oregon ladder entrance weir SFEW2 remained in manual mode. SFEW1 has been able to maintain the pool differential and no out of criteria points were recorded.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
		Yes	WA shore Wasco PUD Unit, OOS to Jan 16, 2020.
		Yes	WA shore Wasco PUD Bypass.
		Yes	Oregon shore Fish Pump 1, OOS to Sep 12, 2020.
Yes			Oregon shore Fish Pump 2, Blade angle: 24°.
Yes			Oregon shore Fish Pump 3, Blade angle: 26°.
		Yes	OR North Powerhouse Pool supply from juvenile fishway.

Comments: The Wasco County PUD turbine unit will remain out of service until the end of the winter maintenance season.

The juvenile system, which was in emergency bypass and no longer supplying flow to the Oregon north powerhouse pool, was removed from service on December 20.

Juvenile Fish Passage Facility

The juvenile system was removed from service on December 20 at 0800 hours when all orifices were closed. Fish were evacuated from the upper and lower emergency bypass channels by 1400 hours. Light maintenance and repairs continued throughout the system. The juvenile system will return to service on approximately February 29.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Powerhouse forebay debris load acceptable?	Light.
X			Trash rack differentials measured this week?	Three times.
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 has dissipated.

There are no problems to report. Gatewell slots will be examined and trash rack differentials will be measured during the winter.

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 last ESBSs were raised in units 2 and 3 on December 20. The screens were examined as they are raised. No juvenile lamprey were observed. ESBS maintenance will begin.

Daily VBS differential monitoring continued until all ESBSs were raised. There are no problems to report.

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: The 42 orifices in use during emergency bypass were closed on December 20. Full winter maintenance season in the channel will begin. There are no problems to report.

Bypass Facility:

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

Comments: All systems remained out of service with maintenance ongoing.

TSW Operations:

The TSWs in spillbays 19 and 20 remained closed for the season.

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
118.9	83.2	0.0	0.0	44.0	44.0	6.0	6.0

Comments: The above data is from the control room.

Other

Inline Cooling Water Strainers: The next cooling water strainer inspections will occur on January 7.

Avian Activity: Casual avian observations continued. Gull and cormorant numbers appear to be declining. There appears to be more roosting activity than feeding.

Gull and cormorant activity in the powerhouse zone was fairly low with a few birds feeding and roosting.

In the spill zone, gull and cormorant numbers were lower. All birds were roosting. Much fewer gulls and cormorants roosted on the top of the navigation lock and Washington ladder walls.

In the bypass outfall zone, a fair number of cormorants along with a few gulls were noted mostly roosting on the full flow pipe.

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, cormorant counts remained fairly high on the outfall pipe. Though, bird numbers were down overall. At this point, further evaluation of laser technology will resume next spring.

In the forebay zone, an occasional gull, gull flock, bald eagle, grebe or cormorant was observed. There appears to be one large gull flock still being observed around the project.

Invasive Species: The mussel examinations will occur throughout the winter dewatering and maintenance season. So far, no problems have been observed.

Fish Rescue/Salvage: During the Washington shore ladder exit dewatering, five steelhead smolts, one Chinook smolt and one small adult steelhead were released unharmed. One Chinook smolt mortality was recorded. There are no further fish to report unless the entrance pool has to be dewatered.

For the juvenile collection channel, combining the switch to emergency bypass and then dewatering, the estimate was a couple of fish of each species: channel catfish, suckers, walleye, northern pike minnow, small mouth bass, yellow perch, shad and carp, with adults and/or juveniles observed. There was also one adult Chinook (was not examined for clip), approximately 45 adult steelhead (mix of clipped and unclipped) and one Chinook smolt (was not examined for clip).

Research: There is no research occurring at this time.

Project: Ice Harbor

Biologist: Ken Fone

Dates: December 20 – December 26, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	Hard	Soft
---	---	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
5	10/15/19	0741	---	---	Install new head gate cylinder in 5A. Also annual maintenance.
1	12/22/19	1729	12/22/19	2357	Tripped off due to loss of 24 VDC governor power supply

Comments: None.

Adult Fish Passage Facility

Ice Harbor Fish Facility staff were on leave for the holidays and not present to perform fishway inspections during this reporting period. Powerhouse operators performed abbreviated daily fishway inspections, which included recording staff gauge readings of the ladder exit differentials and depths over the stationary weirs, and a visual check verifying the presence of attraction flow coming out of the ladder entrances. Operators also periodically observed entrance weir depth and channel/tailwater differential readings on the control room PLC.

The absence of checked boxes in the tables indicate inspection points that were not checked or readings that were not recorded.

Fish Ladders:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head \leq 0.3'	
---	---	North Ladder Picketed Lead Differential	Head \leq 0.3'	
	X	North Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	1.4'
X		South Ladder Exit Differential	Head \leq 0.3'	
---	---	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
---	---	---	South Shore Entrance (SFE-1) Weir Depth	\geq 8.0' or on sill	
---	---	---	South Shore Channel/Tailwater Differential	1.0' – 2.0'	
---	---	---	South Shore Channel Velocity	1.5 – 4.0 fps	
---	---	---	North Powerhouse Entrance (NFE-1) Weir Depth	\geq 8.0' or on sill	
---	---	---	North Powerhouse Entrance Channel/Tailwater Differential	1.0' – 2.0'	
---	---	---	North Shore Entrance (NEW-2) Weir Depth	\geq 8.0' or on sill	
---	---	---	North Shore Channel/Tailwater Differential	1.0' – 2.0'	

Comments: The depth over the stationary weirs in the north ladder was above criteria on the December 24 inspection. The cause of the high depth over the weirs is unknown, but it was in criteria on the other inspections.

Auxiliary Water Supply System:

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

Comments: South shore AWS pump #1 was taken out of service at 0840 hours on December 11 due to excessive noise coming from the pump.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
---	---	---	Forebay debris load acceptable? (amount)	
		X	Gatewell drawdown measured this week?	
		X	Gatewell drawdown acceptable	
---	---	---	Any debris seen in gatewells (% coverage)	
X			Any oil seen in gatewells?	1A, 1B, 1C, 3B, 4A, 5C

Comments: Oil sheens were observed in the listed gatewell slots on December 23. A total of approximately ¾ cup of oil had seeped from the STS gearboxes after they were raised out of the water, due to the gearboxes being exposed to temperature differences between the water and air. Oil absorbent pads were deployed and the appropriate agencies were notified of the oil spill.

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: The STSs for units 1, 3, and 5 were raised out of the water on December 14 for winter maintenance. The STSs for units 4, 2, and 6 were raised on December 16, 17, and 18, respectively.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
		X	Orifices operating satisfactory?	0
		X	Dewaterer and cleaning systems operating satisfactory?	

Comments: On December 19, orifices were closed and the juvenile fish bypass was unwatered for winter maintenance.

Juvenile Fish Facility: The fish facility is unwatered for winter maintenance.

Fish Sampling: Sampling has ended for the year.

Removable Spillway Weir (RSW): Voluntary spill for fish passage has 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
26.8	12.0	0	0	42	42	10.0	10.0

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: The next strainer inspections for lamprey will occur in January.

Avian Activity: Observations were not noted during inspections.

Invasive Species: Monitoring stations were not inspected.

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: None.

Research: None.

Project: Lower Monumental

Biologists: Chuck Barnes and Raymond Addis

Dates: December 20-26, 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 1	12/18/19	08:30	1/9/2020	ERTS	Annual Maintenance
Unit 2	7/15/2019	07:20	2/28/2020	ERTS	Annual Maintenance/Draft Tube Liner Repair

Comments: Units went into Soft Restraint at 0001 on November 1.

Adult Fish Passage Facility

The adult fishways were inspected by USACE biologists on December 23.

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: None.

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 inspection with readings of 7.0 feet.

South Powerhouse Entrance weir (SPE-2) was on sill during inspection with readings of 7.0.

South Shore Entrance weir (SSE-1) was on sill during inspection with readings of 8.1 feet.

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: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	83 yd ²
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
		X	Any debris seen in gatewells (% coverage)	STS screens dogged off in gatewells
	X		Any oil seen in gatewells?	

Comments: None.

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: All STS's were removed from the gatewells for winter maintenance December 16-19.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
		X	Orifices operating satisfactory?	0
	X		Dewaterer and cleaning systems operating satisfactory?	

Comments: All orifices were closed and the juvenile channel, primary dewatering structure and bypass pipe were dewatered at 1000 hours on December 16 for annual winter maintenance. Fish were crowded as the channel was dewatered and routed back to the tailrace through emergency bypass pipe per the dewatering fish salvage plan. No mortalities occurred and all fish were successfully removed from the system.

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
25.6	12.1	0.0	0.0	43.5	43.4	7.0	6.5

*Adult Channel temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on December 17. A total of approximately 1200 juvenile American shad mortalities were spread across units 1, 3, 4, 5 and 6.

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
12/23/2019	13:30	11	5	0	0	0

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 December 2.

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.

Fish Rescue/Salvage: Juvenile channel, primary dewatering structure and bypass flume dewatered at 1000 hours on 16 December. See “collection channel” section above for details.

Research: No Research took place during this reporting period.

Project: Little Goose

Biologists: Scott St. John and Richard Weis

Dates: December 20-26, 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
1	11/25/19	15:30	12/20/19	11:25	Unit Annual, VBS/ESBS Inspection

Comments: Unit #1 returned to service on December 20 at 11:25 am.

Adult Fish Passage Facility

Little Goose fish facility staff inspected the adult fishway on December 23 only due to extended holiday season.

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'	
	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	

Comments: Subsurface water velocity was measured near NPE on December 10 using a Rickly velocity meter and averaged 2.3 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: None.

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 2,300 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 screens were pulled out for the season the week of December 16.

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: Juvenile fishway was dewatered on December 19.

Collection Facility: The Juvenile Fish Facility dewatered for winter maintenance.

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

Spillway Weir: 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
24.2	11.6	0.0	0.0	40.9	40.9	6.0+	6.0

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on December 18 with no lamprey or Salmonids being observed.

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: On December 19 the Juvenile Channel and Dewaterer were drained and 75 adult Salmonids were returned to the river. 2 Coho were also seen. 2 Steelhead were seen not gilling and presumed dead.

Research: N/A

Project: Lower Granite

Biologists: Elizabeth Holdren and David Miller

Dates: December 20-26, 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/oil replacement
Unit 1	11/23	0545	12/19	1240	Forced OOS due to field ground (rotor)
Unit 6	12/05	1205			Investigate source of oil sheen in tailrace

Comments: None.

Adult Fish Passage Facility

Lower Granite Corps biologist's inspected the adult fish ladder December 23 and 26.

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: None.

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'	
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	1.1, 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. SSE gates were repositioned to a depth of greater than 8.0 feet in response to out of criteria readings. Operations returned the fish ladder control system to auto operation at 0905 hours December 4 to determine if the control system will maintain criteria with calm tailwater conditions.

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: None.

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: None.

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: All ESBSs are removed and dogged off in the gatewell slots.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

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

Comments: The collection channel and PDW were dewatered for winter maintenance December 18th.

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
27.3	20.6	0	0	41.0	40.0	5.0+	5.0+

*Cooling water intake temperature.

Other

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

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: The adult trap is closed for the season.

Fish Rescue/Salvage: No fish salvages occurred during this reporting period.

Research: No research is currently occurring.