BC Hydro
Power smart

Site C Clean Energy Project

Permanent Upstream Fish Passage Facility Operations Report

Reporting Period: April 1 to 30, 2025

Prepared by BC Hydro

May 12, 2025

Introduction

BC Hydro filled the Site C Reservoir and started to operate the generating station in the fall of 2024. As such, the permanent upstream fish passage facility (hereafter permanent facility) was operated at the outlet of the generating station to provide for fish passage during the operations phase of the Project.

BC Hydro discovered that the motor and variable frequency drive for the crowder were undersized during pre-commissioning testing on March 28, 2025. BC Hydro could not operate the permanent facility until the replacement parts were shipped to site and installed on April 7, 2025. As a result, BC Hydro implemented the contingent measures listed in Section 4.8 of the Fish Passage Management Plan[1].

Contingent measures consisted of a single boat electroshocking survey (hereafter contingent fish capture and transport) to capture target species downstream of the generating station and transport and release them upstream of the Project. Only those species trying to fulfill life history requirements upstream of the Project (Arctic Grayling, Bull Trout, Rainbow Trout, and Suckers) were transported and released upstream of the Project during the reporting period (EIS, Volume 2, Appendix O[2]; BC Hydro 2015[3]). All other species were released at their capture location downstream of the Project.

Operation of the permanent facility and implementation of contingent fish capture collectively provided for upstream fish passage for target species during the reporting period.

Structure of the report

This report summarizes the data and information presented in weekly reports prepared by the facility operator, as described in the Manual of Operational Parameters and Procedures (OPP), and covers the full extent of operations in April 2025.

This report has the following sections:

- Biological operation;
- Environmental conditions;
- Mechanical operation;
- Adjustments; and
- Contingent fish capture and transport.

Biological operation is defined as the sorting, sampling, tagging, transport and release of fish. Mechanical operation is defined as the operation of the pumps, gates, crowder, lock, sensors, loggers, and other mechanical equipment to ensure the permanent facility achieves the biological objectives described in Section 4.1 of the Fish Passage Management Plan[4].

Summary

One hundred and eighty one fish – 169 Mountain Whitefish, 8 Arctic Grayling, and 4 Rainbow Trout – were sorted and sampled at the permanent facility, and transported and released into the Site C Reservoir (Table 1, Photo 1).

BC Hydro began commissioning the permanent facility on April 8, 2025. In general the facility operated in a manner consistent with expectations, however a number of minor adjustments were made to improve the biological and mechanical operation of the facility during the reporting period.

[1] Available at: http://sitecproject.com/sites/default/files/Fish%20Passage%20Management%20Plan.pdf
[2] Available at: https://www.ceaa-acee.gc.ca/050/documents_staticpost/63919/85328/Vol2_Appendix_O.pdf
[3] Available at: http://sitecproject.com/sites/default/files/Fisheries-and-Aquatic-Habitat-Monitoring-and-Follow-up-Program.pdf
[4] Available at: http://sitecproject.com/sites/default/files/Fish%20Passage%20Management%20Plan.pdf

Biological operation

In total, 181 fish were sorted in the permanent facility during the reporting period (Table 1; Figure 1). One mortality (Mountain Whitefish) was observed during the reporting period (0.6% of all fish sorted in 2025), which is in-line with the anticipated levels of mortality during operations[5].

Table 1. Total number of fish sorted, sampled, transported and released during the reporting period.

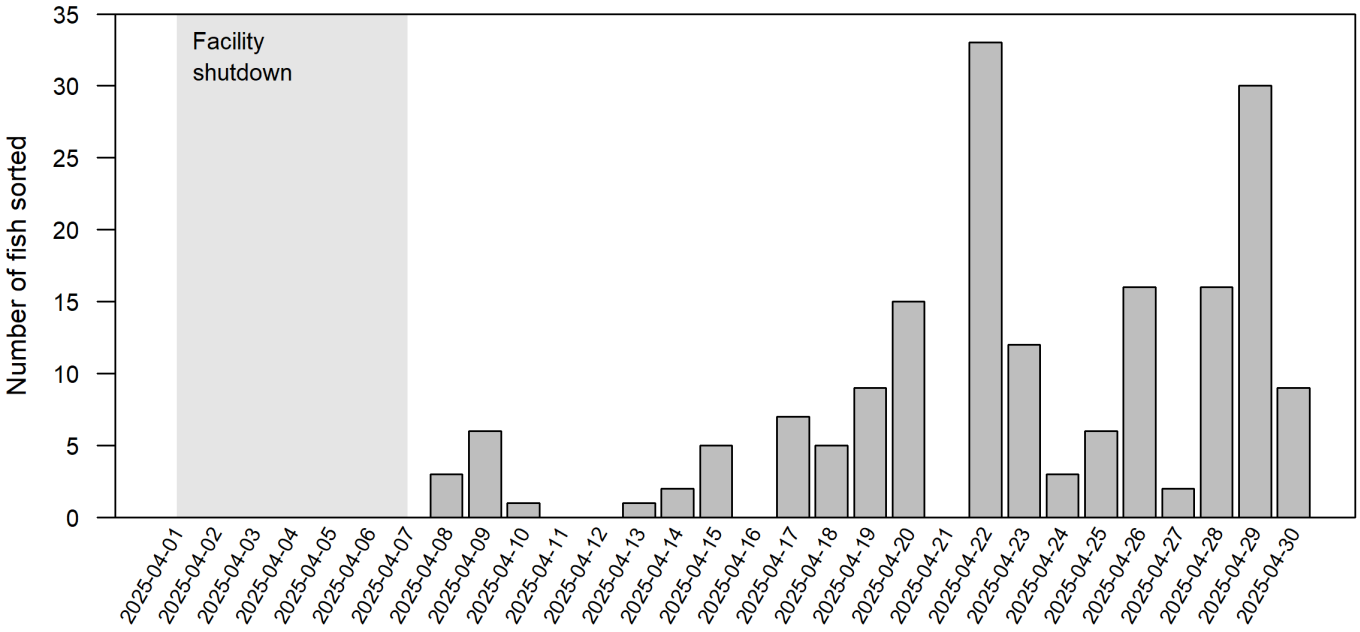
Species	Sorted	Transported and released	PIT tagged	Mortalities	Genetics	Microchemistry or ageing
Arctic Grayling	8	8	5		6	8
Brook Stickleback						
Brook Trout						
Bull Trout						
Burbot						
Finescale Dace						
Flathead Chub						
Goldeye						
Kokanee						
Lake Chub						
Lake Trout						
Lake Whitefish						
Largescale Sucker						
Longnose Dace						
Longnose Sucker						
Mountain Whitefish	169	169	153	1		105
Northern Pike						
Northern Pikeminnow						
Northern Redbelly Dace						
Peamouth						
Pearl Dace						
Prickly Sculpin						
Pygmy Whitefish						
Rainbow Trout	4	4	4		4	4
Redside Shiner						
Slimy Sculpin						
Spoonhead Sculpin						
Spottail Shiner						
Trout-perch						
Walleye						
White Sucker						
Yellow Perch						
Grand total	181	181	162	1	10	117

Not all fish species were PIT tagged or sampled for genetics, microchemistry, or ageing, as described in the OPP.

[5] The FAA for Main Civil Works and Facility Operations (15-HPAC-01160) describes an acceptable level of incidental mortality to be no more than 5% of the total number of fish sorted in the temporary facility on an annual basis.

Between zero and 33 fish were sorted daily during the reporting period (Figure 1).

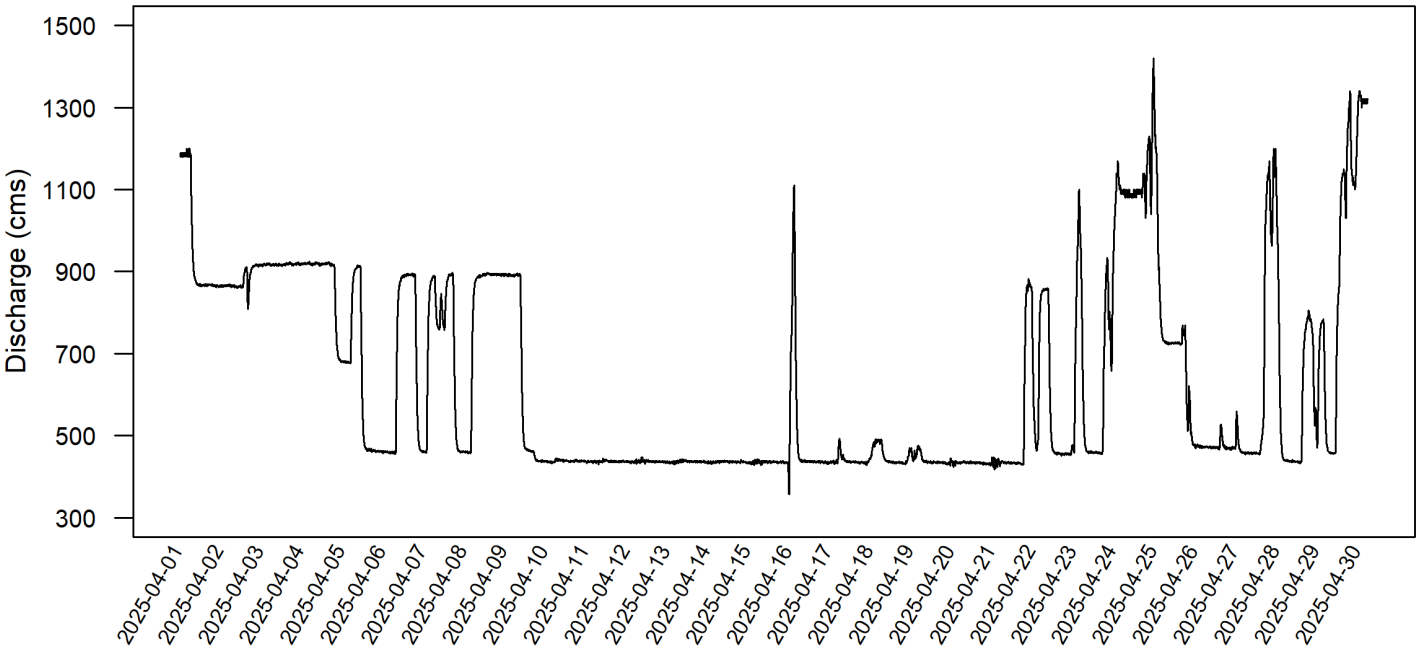
Figure 1. Daily number of fish sorted in the permanent facility during the reporting period.



Environmental conditions

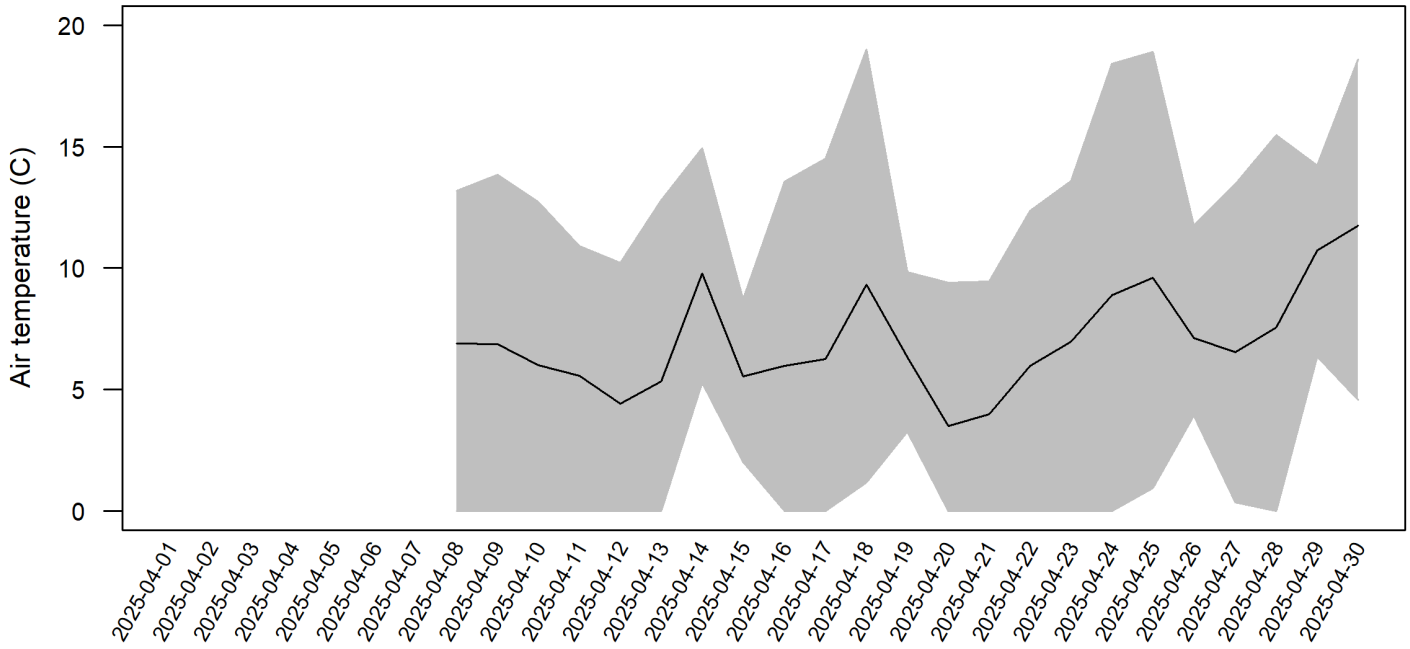
Discharge in the Peace River fluctuated during the reporting period from a low of 357 cms on April 16 to a high of 1420 cms on April 25 (Figure 2).

Figure 2. Discharge in the Peace River during the reporting period as measured at the Peace River above Pine River (07FA004) Water Survey of Canada (WSC) hydrometric station. Data were downloaded from the WSC on May 9; the downloaded data were provided at 5-minute intervals and were listed as provisional by the WSC.



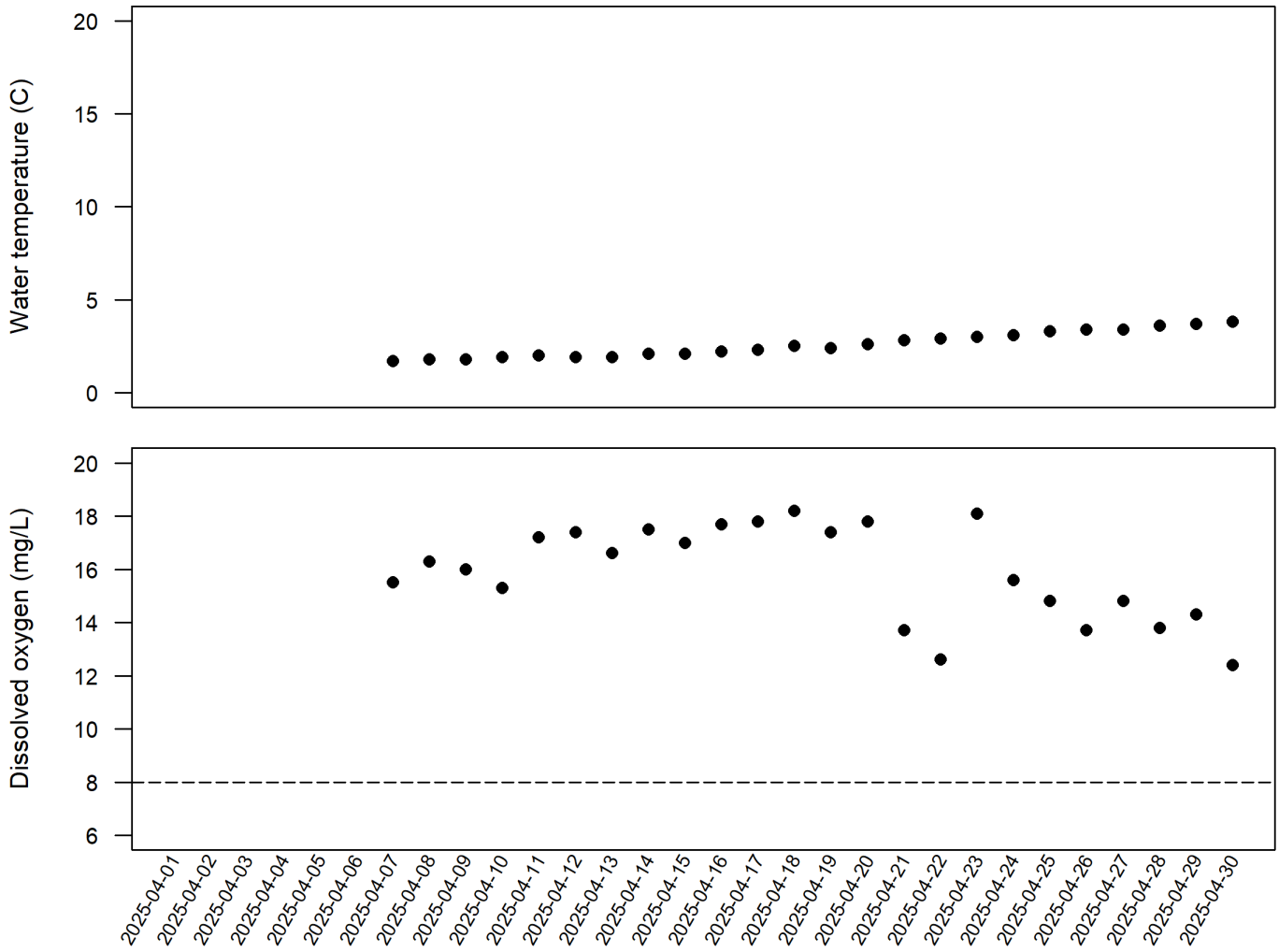
Air temperature fluctuated during the reporting period from a low of 0.0°C on April 8 to a high of 19.0°C on April 18 (Figure 3).

Figure 3. Mean daily air temperature (black line; °C) during the reporting period as measured by a temperature sensor at the permanent facility (TIT-919002). Shaded area represents the minimum and maximum daily air temperatures.



Water temperature slowly increased during the reporting period (Figure 4). Dissolved oxygen remained above the minimum dissolved oxygen level (8.0 mg/L) described in the design report of the permanent facility.

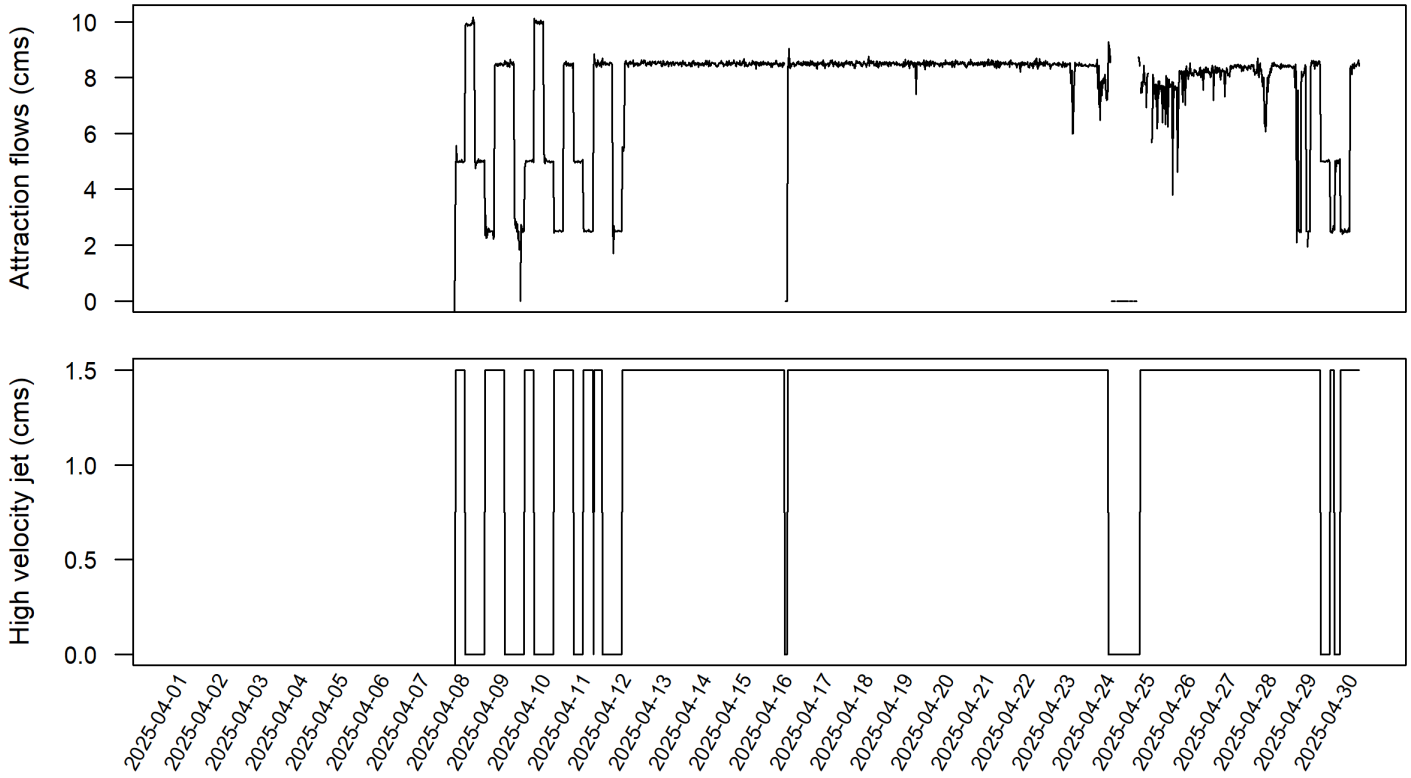
Figure 4. Daily water temperature (°C) and dissolved oxygen (mg/L) during the reporting period as measured in the pre-sort holding pool of the permanent facility.



Mechanical operation

Operation of the attraction flows and high velocity jet intends to attract fish towards the fishway entrance. Once fish have entered the permanent facility, flows within the fishway intend to provide a flow signal for fish to detect and swim up each pool to the sorting facility.

Figure 5. Operation of the attraction flows and high velocity jet during the reporting period.



Fish were crowded daily from the pre-sort holding pool into the fish lock. Operators then proceeded to raise crowded fish to the elevation of the sorting facility. Note that this process is referred to as a “sorting cycle”. Between three and seven sorting cycles were conducted each day during the reporting period, with the exception of April 1 to 7 and April 16 when the facility was shutdown (Table 2).

Table 2. Daily total number of sorting cycles.

Date	Number of sorting cycles	Start time
2025-04-01	-	Facility shutdown
2025-04-02	-	Facility shutdown
2025-04-03	-	Facility shutdown
2025-04-04	-	Facility shutdown
2025-04-05	-	Facility shutdown
2025-04-06	-	Facility shutdown
2025-04-07	-	Facility shutdown
2025-04-08	3	09:35, 13:30, 14:36
2025-04-09	6	09:46, 10:33, 11:41, 12:40, 13:42, 14:33
2025-04-10	4	10:32, 11:30, 12:02, 14:41
2025-04-11	4	09:38, 10:18, 11:26, 13:29
2025-04-12	5	09:03, 10:13, 11:36, 13:09, 14:17
2025-04-13	5	09:05, 10:08, 11:08, 12:06, 13:58
2025-04-14	5	09:11, 09:52, 10:33, 12:04, 13:21
2025-04-15	7	08:54, 09:59, 10:29, 11:12, 12:20, 13:41, 14:07
2025-04-16	-	Facility shutdown
2025-04-17	6	08:54, 09:56, 10:44, 11:43, 12:47, 13:50
2025-04-18	5	09:31, 11:03, 12:01, 13:06, 14:10
2025-04-19	6	08:58, 09:51, 11:02, 12:26, 13:05, 13:32
2025-04-20	6	08:56, 09:44, 11:15, 12:44, 13:31, 14:29
2025-04-21	6	09:08, 09:55, 10:52, 12:17, 13:05, 13:48
2025-04-22	7	08:54, 09:57, 10:46, 11:59, 12:55, 13:22, 14:18
2025-04-23	7	08:58, 10:06, 10:43, 11:40, 12:38, 13:30, 14:08
2025-04-24	6	09:33, 10:31, 11:38, 12:54, 13:41, 14:46
2025-04-25	5	10:16, 11:13, 12:03, 13:24, 14:25
2025-04-26	6	09:27, 10:23, 11:36, 12:26, 13:45, 14:45
2025-04-27	6	09:31, 10:07, 11:16, 12:17, 13:21, 14:12
2025-04-28	6	08:49, 09:51, 10:56, 12:46, 13:34, 15:02
2025-04-29	6	09:26, 10:31, 12:05, 13:26, 13:56, 14:52
2025-04-30	6	09:00, 11:21, 11:43, 13:30, 14:01, 14:45

Table 3. Summary of standby or shutdown periods during the reporting period.

Date	Standby or shutdown	Rationale
2025-04-01 00:00 to 2025-04-08 09:35	Shutdown	Facility was shutdown while a larger motor and variable frequency drive for the crowder were shipped to site and installed on April 7.
2025-04-16 09:06 to 2025-04-16 09:23	Shutdown	A crew was working on a transformer in the generating station when the transformer caused generating units #3 and 4 to trip offline. This resulted in a power outage in the powerhouse, which lead to a brief loss of power (unplanned shutdown) at the permanent facility.
2025-04-24 15:30 to 2025-04-25 08:45	Shutdown	A planned power outage was scheduled for 17:00 to 21:00 on April 24. At 15:30 on April 24, the operator proactively turned off the pumps and drained the fishway. Operator turned the fishway back on at 08:45 on April 25.

Table 4. Root causes and corrective actions as a result of equipment malfunctions, breakdowns, or damage during the reporting period.

Date	Malfunction, breakdown or damage	Description	Root cause	Corrective action
N/A	N/A	N/A	N/A	N/A

Adjustments

Several adjustments were made during the reporting period to improve the biological and mechanical operation of the permanent facility (Table 5). BC Hydro described the potential for adjustments to the day-to-day biological and mechanical operation of the permanent facility in Section 7 of the Fish Passage Management Plan[2]. In general the permanent facility was operated as planned and described in the OPP.

Table 5. Summary of adjustments made to the biological and mechanical operation of the permanent facility during the reporting period.

Component	Adjustment
Biological operation	A number of minor adjustments were made to improve the biological and mechanical operation of the permanent facility during the reporting period. None of the adjustments changed the operation in a material way.
Mechanical operation	

Contingent fish capture and transport

In total, 17 fish were transported upstream through contingent fish capture during the reporting period (Table 6). Specifically, 7 Bull Trout, 7 Rainbow Trout, 2 White Sucker, and 1 Largescale Sucker were transported upstream of the Project.

Table 6. Number of fish captured by boat electroshocking and transported and released upstream (U) and downstream (D) of the Project.

Species	Session 1	
	April 1	
	U	D
Arctic Grayling		
Brook Stickleback		
Brook Trout		
Bull Trout	7	
Burbot		1
Finescale Dace		
Flathead Chub		
Goldeye		
Kokanee		1
Lake Chub		
Lake Trout		
Lake Whitefish		
Largescale Sucker	1	
Longnose Dace		
Longnose Sucker		
Mountain Whitefish		66
Northern Pike		5
Northern Pikeminnow		
Northern Redbelly Dace		
Peamouth		
Pearl Dace		
Prickly Sculpin		
Pygmy Whitefish		
Rainbow Trout	7	
Redside Shiner		
Slimy Sculpin		
Spoonhead Sculpin		
Spottail Shiner		
Trout-perch		
Walleye		
White Sucker	2	
Yellow Perch		
Total	17	73
Grand total	90	

Photos

Photo 1. Operator transports captured fish for release upstream of the Project (top; April 11, 2025). Fish are released into the reservoir near the embayment of Cache Creek (bottom; April 22, 2025).

Photo 2. Operator processed 8 Arctic Grayling (April 18, 2025) and 4 Rainbow Trout (April 29, 2025) during the reporting period.

Prepared by

This report was prepared by the following individuals:

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