# Fish Passage Plan (FPP) Change Form

**Change Form # & Title**: 23BON001 - B2FGE Updates

**Date Submitted**: 19-JAN-2023

**Project**: Bonneville Dan

**Requester Name, Agency**: Jon Rerecich, CENWP-PM-EF

**Final Action: APPROVED 3-FEB-2023**

**FPP Section**:

Chapter 2. Bonneville Dam, section 4.2.1 Turbine Operating Range / In-season.

**Justification for Change**:

B2FGE program structural gatewell improvements are underway in 2023. Gatewell hydraulic conditions for bypassed fish will be improved as modified units are completed. Prioritizing increasing flows in modified units above the mid 1% peak efficiency range to the upper 1% when spilling 150 kcfs to 180 kcfs will minimize juvenile passage impacts through the bypass system.

The original intent of notifying FPOM ASAP (no later than 3 workdays) was for times when the FPP operations were not being followed. The FPP is regularly followed and a summary of the 1% operations in the Weekly Report is sufficient.

**Proposed Change**:

 *See following pages with edits to existing FPP text in track changes.*

**4.2.1. In-Season: April 10–August 31 (Spring/Summer Spill for Juvenile Fish Passage).**

**4.2.1.1. PH1:** Units 1-10 will be operated between the 1% lower limit and the Best Operating Point (BOP), except under limited conditions and durations when PH1 units may be operated above BOP for the use of reserves or for TDG management during high flows (refer to **Appendix C** for more information). All required fish passage spill operations will be met prior to operating PH1 units above BOP.

**4.2.1.2. PH2**: Units 11-18 will be operated within restricted operating ranges as follows:

**4.2.1.2.a.** From April 10 through June 15 (spring spill), as a soft constraint, PH2 units should not be operated below the 1% mid-range (< 13 kcfs) to minimize turbulence for turbine-passed fish.

**4.2.1.2.b.** From April 1 through July 31, PH2 units will be operated within the 1% mid-range (13–15 kcfs) to minimize turbulence for bypassed fish until gatewell structural modifications are completed. *RCC will issue a teletype with any in-season modifications as construction and testing is completed*.

During this time, excess flow above project capacity (PH2 in mid-range + PH1 at BOP + FOP spill + corner collector, ladders, etc.) will be passed in the following sequential order with increasing flow, or as otherwise determined by Project Fisheries based on observed conditions. This sequence of operations is also summarized in **Table BON-14**:

April 1–9 Pre-Spring Spill and June 16 – July 31 Summer Spill:

1. Increase PH2 units up to the 1% upper limit.
2. Then, increase spill.

April 10 – June 15 Spring Spill w/ Juvenile Trigger: when juvenile spring Chinook collection counts exceed adult spring Chinook total passage counts (excluding jacks) for at least three consecutive days, Project Fisheries will notify the control room to pass additional flow as follows:

1. Maintain PH2 units within the mid-range and increase spill up to a maximum of 150 kcfs to avoid causing erosion in the spillway stilling basin.
2. Then, increase PH2 units above the mid-range to the 1% upper limit prioritizing B2FGE modified units first (11, 18, 15, …) then the remaining unmodified units in order from south to north.  *Include 1% operation summary in the Weekly Report.*
3. Then, increase spill above 150 kcfs, up to 180 kcfs. *PH2 UNITS MAY ONLY BE OPERATED ABOVE THE MID-RANGE WHEN SPILL IS BETWEEN 150 KCFS AND 180 KCFS.*
4. Then, increase spill above 180 kcfs and resume operating PH2 units within the mid-range.

April 10 – June 15 Spring Spill w/ Adult Trigger: when adult spring Chinook total passage counts5 (excluding jacks) exceed juvenile spring Chinook collection counts4 for two consecutive days, Project Fisheries will notify the control room to pass additional flow as follows:

1. Increase PH2 units up to the 1% upper limit in order from north to south (Unit 18 to Unit 11).
2. Then, increase spill.

Table BON-. Sequential Steps to Pass Increasing Flow per Temporary PH2 Operating Range Guidelines in section 4.2.2.2.b.

|  |  |
| --- | --- |
| **April 1 – 9** | 1. PH2 in mid-range + PH1 up to BOP.
 |
| **Pre-FOP Spill** | 1. Then, increase PH2 > mid-range up to 1% upper limit.
 |
|  | 1. Then, spill (start with B2CC if not already open).
 |
| **April 10 – June 15** | **JUVENILE TRIGGER** |
| **FOP Spring Spill** | 1. FOP Spring Spill + PH2 in mid-range + PH1 up to BOP.
 |
|  | 1. Then, increase spill above FOP up to 150 kcfs.
 |
|  | 1. Then, increase PH2 above mid-range up to 1% upper limit (B2FGE modified units first, then unmodified units south to north)*.*
 |
|  | 1. Then, increase spill up to 180 kcfs.
 |
|  | 1. Then, increase spill above 180 kcfs and resume PH2 in mid-range.
 |
|  | **ADULT TRIGGER** |
|  | 1. FOP Spring Spill + PH2 in mid-range + PH1 up to BOP.
 |
|  | 1. Then, increase PH2 up to 1% upper limit (north to south).
 |
|  | 1. Then, increase spill above FOP.
 |
| **June 16 – July 31** | 1. FOP Summer Spill + PH2 in mid-range + PH1 up to BOP.
 |
| **FOP Summer Spill** | 1. Then, increase PH2 up to 1% upper limit.
 |
|  | 1. Then, increase spill above FOP.
 |
| **August 1 – 31\*****FOP Summer Spill** | 1. FOP Summer Spill + PH2 in full 1% (\*see footnote) + PH1 up to BOP.
2. Then, increase spill above FOP.
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\*Starting August 1, PH2 units may be operated within the full 1% range for flexibility during low flow. PH2 units will typically be within the mid-range but may be adjusted through the full 1% range as necessary to avoid dead-band issues during low flow. PH2 operations above the mid-range will be infrequent, consistent with previous years.

**Comments**:

FPOM FPP Meeting 3-FEB-2023:

Conder – NOAA is supportive. This should be an improvement for fish, assuming the mods work.

Lorz – this makes sense.

Ebel – how confident is the Corps in these mods?

Rerecich- reasonably confident. Hydraulic results from U15 in 2022 showed the structure successfully reduced turbulence in gatewell and met NOAA criteria for flow velocity. Compared to unmodified units, this is a better configuration. Keep in mind that the HDC re-analysis also shifted the 1% range to a lower flow already so there will be less water moving through the units.

Van Dyke – is the new 1% range in the FPP table?

Rerecich – yes it was updated last year.

Van Dyke – so the FPP was changed even though the work hasn’t been done?

Rerecich – no, the updated 1% range from HDC is for the units regardless of whether they’ve been modified or not. This is a separate topic.

Swank – are there plans to do biological testing to evaluate the structures?

Rerecich – yes, it’s part of post-construction eval through SRWG. In process of drafting white paper now.

Swank – ok with this change. Ideally would have bio testing first.

Rerecich – want to point out this is NOT opening up the PH2 operating range, but only applies when we’re already going to go above the mid-range to avoid pulling rocks into spillway stilling basin and just prioritizes the modified units first. The conversation about opening up the range is still to come.

**Record of Final Action**: Approved at the FPOM FPP meeting on February 3, 2023.