# Fish Passage Plan (FPP) Change Request Form

**Change Form # & Title**: 19LGS004 – Channel Velocity

**Date Submitted**: December 20, 2018

**Project**: Little Goose Dam

**Requester Name, Agency**: Scott St. John, USACE LGS

**Final Action:**

**FPP Section**: Chapter 4 – Little Goose Dam, section 2.3.2.8. Channel Velocity

**Justification for Change**: Subsurface water velocity measurements are taken monthly using a rickly velocity meter that was permanently mounted near the north powerhouse fishway entrance a number of years ago. Little Goose is requesting that the surface velocity be measured in the same location in order to more easily compare the two measurements.

**Proposed Change**: *[see below with edits to existing FPP in track changes]*

**2.3.2.8. Channel Velocity.** 1.5' – 4' per second.

Adult collection channel water velocities must be between 1.5 and 4 feet per second. This is the optimum velocity for returning adult salmon and steelhead to migrate upstream through the fishway. Velocity readings will be included in required fishway inspections and reported in weekly and annual reports.

Surface water velocities will be measured in the open access area near the north powerhouse weir / fish entrance. The surface velocity will be measured using a piece of woody debris (stick, bark) or water bubble timed over a marked fixed distance. The measurement of the water velocity at this location typifies the velocity conditions throughout the length of the channel.

Subsurface water velocity will be measured and reported once per month using an underwater flowmeter. The average velocity will be calculated using several measurements taken at various depths across the width of the channel that best represents the average subsurface flow. The measurements will be taken at a location in the channel that represents the overall flow characteristic.

**Comments**: (listed oldest to newest)

2/7/19 FPOM FPP Meeting: Peery will coordinate with St. John to get more information on the reason for the move and the comparability with the south shore entrance. He will send that info out to FPOM for follow-up at next week’s meeting on 2/14.

2/8/19 Chris Peery, via email to Scott St. John: During the FPP Change meeting, different methods and challenges of measuring surface velocities were discussed. Logistics of dealing with fluctuating tailrace levels and funding for new equipment are the primary obstacles to overcome.

* What is the justification for moving the location of the velocity meter?
* Will readings at new location be representative of fishway conditions?
* Are there better methods to collect surface velocity measurements?

Reply from Scott St. John:

“Yes, the NPE and NSE entrances are the two areas we have access to that provide the most laminar flow. Unfortunately we cannot access the NSE area during some Spring spill operations due to safety constraints. Little Goose has not been able to adjust the sluice gates which control the flow into the adult fishway provided from the AWS pumps. This has been an issue for many years and has not been ranked high enough for procuring additional funding. Additionally, it has been well documented in adult annual reports that the area near the SSE does not provide laminar flow (see below). Lastly, the turn at the bottom of the ladder (junction pool) and split near SSE and adult channel also create flow conditions that are not conducive for monitoring surface velocity.

Adult Annual Report: "An electronic water velocity meter (flowmeter) was added to the collection channel near the SSE in November 1997. The meter was programmed to measure subsurface water velocities near the junction pool and diffuser 2. Diffuser 2 (the largest of the water supplying diffusers) produced upwelling and non-laminar flows making measurements unreliable. The flowmeter failed in spring of 2011 and was replaced with a hydrologic current meter. In 2016, subsurface water flow velocities were measured near the NPE approximately midpoint of collection channel where flows are more representative of the entire collection channel."

I am unsure why my predecessors did not have this changed in the FPP. If you have any further questions, please let me know.”

2/14/19 FPOM: Lorz wondered how the new location data correlate with data from the previous location. Setter said the point is to make sure ladder is in criteria. Lorz doesn’t have a problem with moving it but wants to ensure it is representative of how the ladder is actually operating. Setter will take this back to Scott St. John to have further review and discussion at the next FPOM on 3/14. PENDING

**Record of Final Action**: