

# Dam Project Progress Report – *Jerry Peterson & Karen Cowan, SLPOA Board Directors*

November, 2022 |



The Spirit Lake dam replacement project is moving ahead, albeit more slowly than desired. A Memorandum of Understanding (MOU) has been finalized between SLPOA, the City of Spirit Lake, and property owner, Dave Simon. This MOU is a requirement of Department of Lands in order to accept permit applications for the weir project.

**Karen Cowan** and **Jerry Peterson** met with City of Spirit Lake officials in early September, 2022. All permits with Department of Lands, water rights and other permits are completed and in the hands of the City. The City of Spirit Lake will be the responsible party for the weir and as such must submit the permit applications. As of November 10, 2022, SLPOA has been notified that all construction permit applications have been signed, submitted and the public notification application fee paid by the City of Spirit Lake City officials. SLPOA will reimburse the city for the public notification fee. We are now ready to seek contractors interested in bidding to construct the project.

Other fantastic news is that SLPOA members and friends have contributed generously. Most recently two more members pledged \$10,000 each to another matching fundraising challenge. Meeting this challenge will put the Dam Fund over the \$200,000 mark that we believe is sufficient to fully fund the project to completion. With everyone getting on board we can reach our goal of replacing the dam within the next year.

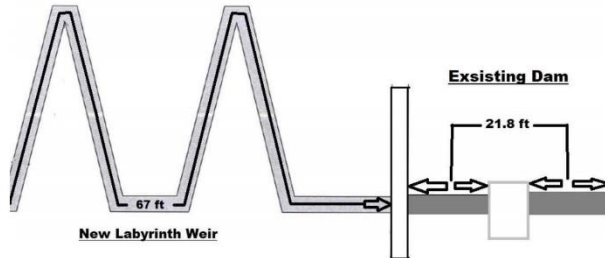
The picture at the right, taken this fall by **Kurt Peterson**, SLPOA Board Director, shows some of the obvious deterioration of the existing dam. In addition, the installation of the weir will eliminate the need to manually remove boards. It will take the guesswork out of regulating water flow and lake levels during high water spring runoff.



# Engineering the Weir – Jerry Peterson, SLPOA Board Director

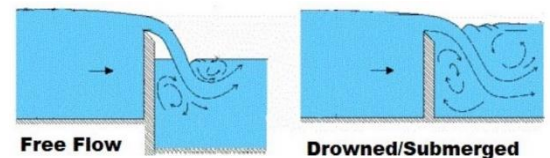
April, 2022 |

The current dam was built by Panhandle Lumber Co in 1908 to maintain the water level in the pond for their sawmill operation and is 114 years old. It consists of 6 removable boards (3 on each side) which have been replaced numerous



times and a concrete structure that is deteriorating. Leakage can be observed not only around and through the boards, but under the concrete structure itself due to undermining at the base. Removal and reinstallation of the boards to control the water level is not only extremely dangerous, but it is left up to the discretion (i.e. “best guess”) of humans as when it should occur. Letting out too much results in low lake levels, not letting enough results in flooding & shore line erosion. And, of course, there is always a chance of vandalism.

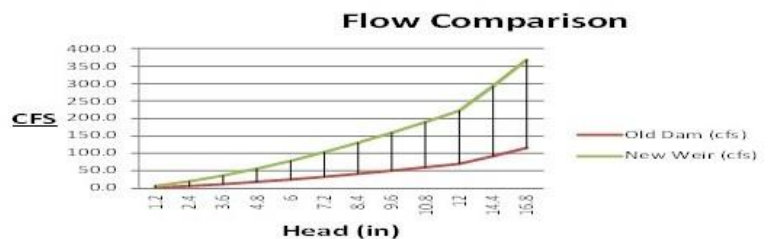
The proposed replacement for the Dam is a Labyrinth Weir and has been determined to be the best solution for all our situation. Because of its “W” design, it has an effective spillway length of 67 ft vs. the current 21.8 ft straight design, resulting in a minimum of 207% increase of water flow over the top. This is important to reduce flooding and erosion during extreme high-water conditions. The back of the Weir is taller. This creates a free flow design for additional water discharge with a plunge pool that will absorb the energy creating a gentler flow downstream with less erosion (see diagram).



Since the Weir is a standalone design, there will be no human decision or intervention needed. To reduce flooding and erosion along the lake shore, it will immediately start spilling water just below the Ordinary High Water (OHW) level, resulting in a gentle/moderate fluctuation in lake levels, as opposed to waiting until the water is well over the existing dam to pull boards, then, deciding when to replace them. The diagram (below) shows that the higher the lake level—Head inches—the amount of water that will flow past the weir is greater (cubic feet per second or CFS) than that flowing past the current dam. Thus, the weir can better manage flooding around the lake in a high runoff year.

Kootenai County established the 10-year elevation of Spirit Lake at 2445.8’ per the NAVD88 (North American Vertical Datum of 1988). The top of our current Dam is 2445.9’ and the top of the proposed new Weir would be 2445.75’—about 4 inches lower than the current Dam.

Flow calculations for the Weir design are based on historical data collected by hydrologist, Chris Hardy. These data show flows over the dam at about 190 cfs (cubic feet/second), in the latter portions of April.



## What the Weir will and won't do:

- It *will* help retain the maximum amount of water that “Mother Nature” gives us, up to our OHW level each year, for as long as possible
- It *will* help erosion issues along the lake shore and downstream of the Weir by being able to discharge more water sooner and at a smooth/even rate, reducing rapid fluctuations in lake levels
- It *will* eliminate the safety issues and decision making for humans
- More water *will* be good for fisheries
- More water *will* help mitigate algae blooms, reduce dock & water intake modifications and maintain property values
- It *won't* stop the build-up of silt behind the bridge causeway.
- It *won't* make “Mother Nature” give us more or less water each year
- It *won't* stop leakage into the aquifer through the bottom and sides of different parts of the lake and mill pond
- It *won't* stop invasive species or erosion and dock damage from boat wakes and wind