Data Submitted (UTC 11): 10/29/2025 7:22:32 PM
First name: Patrick
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Comments: Greetings,

I am a retired engineering geologist and geoscience instructor. I worked for the US Geological Survey's Cascades Volcano Observatory from August 1982 to February 1990. In summer and fall 1982 I logged wells being drilled into the debris blockage to assess its geologic properties. For example, I logged "well 8", which was at Critical Point North and had more than 30 ft of ashfall deposit as the uppermost unit. I also mapped the trench that the USACE cut to install a large pipe into which the floating barges would pump water from Spirit Lake that drained into "Harry's channel". A diagram of my trench mapping showing the geology along both sides of that trench appeared in the December 1982 Monthly Report of the Cascades Volcano Observatory, and the original large mylar drawing of those geologic cross sections was sent to CVO about 10 years ago.

I am well aware of the nature of the hazards from lake-breakout lahars and the associated downstream risks. The largest of those lahars about 2800 years ago had an estimated peak discharge of >250,000 cub meters/s-a transitory discharge equal to, or greater than greater than the Amazon River at flood stage (Scott, 1988 and 1989). So keeping the level of landslide-dammed lakes under control is of paramount importance from a risk perspective.

I think it would be a mistake to cut a channel into the blockage, both from the point of view of the risk from future volcanism and from all the factors mentioned and assessed in the DEIS, for example in Table 7.3. (risk levels). Alternatives C, E, and F are the ones with the least risk as well as the least environmental impact, and of those latter three, C and E appear to have the least impact on downstream sedimentation.

Importantly, I do not see a need for re-drilling of the debris blockage when geotechnical data from those previous studies exists, particularly if no channel alternative is planned. Geophysical studies should be adequate for characterizing the subsurface geology. This approach would minimize damage to the resource-the landscape and ecosystem, and keep with the philosophy of the legislation establishing the Mount St. Helens National Volcanic Monument.

Downstream sedimentation is a major issue. Tunnel alternatives should prioritize minimal downstream sedimentation. And don't forget that extreme hydrologic events can mobilize portions of the debris avalanche to form damaging debris flow. The most recent one was the May 14, 2023 debris flow that took out the road above the tunnel outlet, but previous events include a large debris flow during a storm in January of 1990 that mobilized more than 7 acres of the debris avalanche near "Carbonate springs". That debris flow traveled downstream past Coldwater Creek.

I will submit my comments on roads in another memorandum. I urge the USFS to minimize destruction of the ecological resource. I've already seen serious damage caused by the road along the Truman Trail right of way, with abundant plastics and rubber in bridges that are releasing PFAs and other toxins. Another concern is the taking of water from Willow Creek. This is destroying the aquatic integrity of the stream in addition to the research plots.