

Date: June 11, 2020

Subject: Gold Creek pond EIS questions and comments

Attention: United States Forest Service, Cle Elum Ranger Station

Questions:

- What is the problem statement for this project?
- Is the proposal to fill in Gold Creek pond a stand-alone project or is it planned as a mitigation strategy for another project?
 - If this proposal is mitigation strategy for another project (e.g. lowering Kachess reservoir) if that project does not move forward, will the infilling of Gold Creek pond move forward?
 - If this proposal is mitigation strategy for another project or if it is a standalone project, what alternative mitigation strategies are being evaluated in addition to the proposal to infill Gold Creek pond?
- How will the impacts of climate change be evaluated with respect to the proposed infilling of Gold Creek pond?
 - If this proposal is mitigation strategy for another project, how will climate change be evaluated with respect to that project?
- It is my understanding that the proposal to infill Gold Creek pond may improve fish habitat in Gold Creek for bull trout, how many resident bull trout are in this ecosystem?
 - Is there a critical number of bull trout in this ecosystem where it doesn't make sense to move forward with this project on a cost-benefit basis? If so, what is that number?
- The Gold Creek pond area is a recreational area, how will this Federal "4f" designation be addressed in the environmental impact statement (EIS)?
- Will consideration be given to not lowering Keechelus reservoir if it can be shown to improve the stream flow in Gold Creek and improve bull trout habitat?
- If the science (the EIS) can show that the existence of Gold Creek pond leads to a reduction in stream flows and that the infilling of Gold Creek pond will lead to some restoration of stream flows in Gold Creek, what type of material will be used for the infilling?
 - That is, will material similar in physical characteristics to what was excavated at the pond be used for fill?
 - Or will impermeable material such as clays and silts be used as fill?
 - If impermeable material is being considered for fill, will consideration be given to using a pond liner such that the recreational benefit of the pond can remain intact?
 - Will infilling the pond (or installing a pond liner) result in year-round flows in Gold Creek?
- How did Washington State Department of Transportation's (WSDOT) environmental document related to utilizing the Gold Creek pond site as a borrow pit address stream flows and bull trout habitat, both during the mining of material and post mining (reclamation)?
 - Did WSDOT's post mining reclamation work follow what was proposed in their environmental document?

- What are the negative impacts of infilling the pond in addition to the loss of habitat, change/loss of recreational use and construction/environmental impacts during the infilling?

Comments:

Generalized geologic and hydrologic conditions in Gold Creek valley

Gold Creek is an alluvial valley characterized by deposits primarily consisting of sand, gravel and cobbles and some silt and boulders. As a result, the material in valley floor (including the Gold Creek streambed) is permeable. The permeability in the valley is high due to the stream gradient and the seasonally high stream volumes which carries larger diameter material compared to streams with flatter gradients and lower stream volumes which carries finer grained, less permeable material. Precipitation in the valley in a lot of areas infiltrates directly into the ground without ever reaching Gold Creek because of the permeable alluvial deposits. Also, sections of Gold Creek where stream pools exist contain silt in the pool bottom due to the stream velocity being reduced at these locations resulting in the deposition of fine grain material. This material allows the pools to hold water during times of the year when stream flows are low or non-existent, and/or the groundwater table may coincide with the pool. However, other sections of the stream do not have fine grain material as the stream velocities are high enough that the fine grain material does not settle out or if it does settle out during lower flow velocities, it gets scoured out during the spring when velocities are high. Sections of these free-flowing reaches do not hold water during times of the year when flows are low or non-existent. In fact, stream water in these sections are “lost” to the underlying groundwater (if the groundwater table is at a lower elevation than the streambed), hence the term “losing” stream for these types of stream sections.

I have come across a photo of a dry section of Gold Creek from August 1936 which is well before the existence of the Gold Creek pond (this photo can be found at WashingtonRuralHeritage.org, p. 10-I believe that this photo has been forwarded to you, if not I can provide it). Snowfall during the winter of 1935/36 was 494 inches (per Bob Mecklenburg, June 2020). During the last two winters the snowfall has been 345 inches (2019/20) and 304 inches (2018/19) according to the WSDOT website for the Snoqualmie Pass area. Using this (limited) data, there has been a 35% reduction in snowfall which is the primary contributor to the stream flow in Gold Creek. So, filling in the pond probably would have little or no impact on Gold Creek stream flows, since this photo was taken prior to the excavation of the pond when the snowfall was higher than what is occurring now, and yet in 1936 there was (were) a dry section(s) of the creek. Snowpack in this area has been decreasing due to climate change (and this trend is expected to continue in the future) which will result in lower sustained stream flows with or without Gold Creek pond.

A graphic prepared by Natural Systems Design for Kittitas Conservation Trust in 2014 shows projected groundwater flows from waterwell pump tests conducted in August and September of that year, along

with a graphic showing groundwater flows during a period of time between these two pump tests when the groundwater system re-established itself to pre-pumping conditions. The basic groundwater regime is an unconfined aquifer with the ground water flow in general flowing from north to south within Gold Creek valley as one would expect. Also, it is to be expected that there are minor variations in the flow pattern due to differences in the soil particles that comprise the alluvial deposits, that is the groundwater does not flow in a perfectly straight line throughout the length of the valley because the underlying materials are not homogeneous. So, based on the graphic of ground water flows in the area of the pond, the groundwater north of the pond is flowing south to the pond. In fact, if the graphic had been expanded it would show groundwater continuing to flow in a southerly direction south of the pond toward Keechelus reservoir. The flow pattern depicted in the graphic probably was similar to what existed prior to excavating this site for a borrow pit, since the site was characterized by permeable materials, hence it's selection as a borrow pit.

Filling in the pond with materials that have similar physical characteristics to what was excavated will probably result in negligible changes to the groundwater regime and negligible changes to flows in Gold Creek. That is sand, gravel, cobbles, boulders and silt used as fill. Filling in the pond with non-permeable materials such as clay can be expected to have a greater change to groundwater flow than backfill with permeable material, however, the stream flows should not experience much of a change. With non-permeable backfill the groundwater will flow around the east and west sides of the pond, and under the pond assuming that the original pit was not excavated to bedrock. There may be a very localized area where the ground water table is slightly elevated due to a very limited damming action resulting from backfilling the pond with non-permeable material. If the non-permeable backfill option is recommended, the same result could be expected if a pond liner was used in lieu of the backfill. This would allow the recreational use of the pond to remain and it would result in fewer environmental and construction impacts, as well as being a more cost-effective option.

The above noted graphics also show the impacts of well pumping on the adjacent section of Gold Creek. During the pump tests this section of Gold Creek "dried" up, which indicates that in this section there is hydrologic connectivity between the stream and the groundwater system. In other words, the groundwater table is within the stream bed, so that when the groundwater table is drawn down during the pump test, the water within the creek bed is also drawn down. Also, if the assumption is that the pond is "drawing" water out of Gold Creek one would expect this section which is just north of the pond to be dry during this time of year. However, after well pumping stopped the flows were re-established.

Further north there are sections of the creek where stream flow is "lost" to the ground and the stream dries up. In these sections the ground water table is below the elevation of the streambed. Filling in the pond would have negligible to no effect on these sections due to the distance these sections are from the pond and the fact that filling in the pond will not result in raising the groundwater table in these areas.

If the goal of the project is to provide bull trout habitat in Gold Creek, and acknowledging that the habitat is impacted due to dry sections, the best option would be to identify these areas and install streambed liners to prevent stream infiltration into the ground. Further this alternative may need to be supplemented by pumping groundwater into Gold Creek upstream from the sections where the stream flow is low during late summer and fall. This assumes that water rights could be obtained. I believe this option should be evaluated as part of the alternative analysis of the EIS.

In conclusion, I believe that constructing Gold Creek pond has had a negligible impact on flows in Gold Creek. Based on the 1936 photo and homeowners in the Ski Tur community stating that sections of Gold Creek were dry in late summer and fall before the pond site was used as a borrow pit this is a natural condition and is unrelated to the pond.

Please enter my comments into the environmental record; including the scoping record. I look forward to hearing your responses to my questions and comments.

Finally, last week I had sent an email to you indicating that I had stopped into the Cle Elum Ranger Station in July 2019 asking to be put on a project contact list. I do not have any record of being contacted since that time. I have included my contact information below so that I can receive future project information. Thank you.

Respectfully submitted,

Bruce Nebbitt, P.E.

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