

### Lewis County Cost Estimate Questions:

- What is minor change - \$25,000 (Seems like this is part of the contingency)
  - Usually spcc, permitting, ROW, Inspections, and engineering are not included in construction costs; as such they usually don't get a contingency added to their cost.
- Dewatering/Diversion - \$30,000 seems really high. What is driving the cost? Any opportunity to use a gravity diversion?

### 30% Plan Comments:

- Upstream fish exclusion is necessary if the diversion is pumped. Prefer to see a gravity diversion (removes the need for fuel near the creek, backup pumping, need for 24 hour maintenance).
- Area of potential affect: Is this what the APE Map is showing? This will likely cue more cultural resource requirements correct?
- LWM anchoring?
- Does the county see the need for additional bank stabilization using LWM needed on the downstream LB?
  - Existing bank is clay and adding LWM in the proposed location could cause additional scour.
- Location of the upstream wood structure should be further into the active channel. It is likely that it will provide little habitat benefit where it is currently located due to excessive deposition.
  - Preformed scour pool should be deeper than 1 ft associated with the LWM.
- Streambed mix:
  - No 2-man boulders seem quite large for a stream simulation type mix. What is the native material size up and downstream? Additionally, there is very little streambed sediment included in the mix, which results in very little fines (25% SS results in about 2.5% fines). Does the stream have high enough base flow to flow through the proposed porous mix and still maintain sufficient surface flow?
  - I am ok with 2-man boulders in the culvert acting as roughness elements and promoting channel complexity and keeping the stream off the culvert walls.
    - These would look like coarse two man boulder barbs
  - There are 0 2-man boulders in the Middle Fork Newaukum; also very few 6-inch cobbles.
    - What criteria was used to select this streambed mix?
- Most references to the culvert display a 24 foot span, with one exception, on sheet 7 shows 18ft. Should it read 24?
- The design cross section where matching into existing does not have any banks. WAC states that the constructed channel needs to have the same features as the existing channel, which presumably has banks.
- What is the channel bankfull width? The culvert cross section appears to be about 22 ft (2 ft less the two 1' benches) while the cross sections appear to have a 12-14' width (width of streambed materials; no banks in the cross sections.)
- The design depth in the culvert appears a little low. Hard to say based on the low slope, probably relatively low energy, but 1.5 feet at the thalweg seems pretty thin considering the structure width. Corp. requires a minimum 3 feet. What is the anticipated scour/channel development depth?

