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Memorandum

TO: Rick Raymondi, Idaho Department of Water Resources

FROM: Spronk Water Engineers, Inc.; Gregory K. Sullivan, P.E.

CC: Eastern Snake Hydrologic Modeling Committee (ESHMC)

DATE: October 31, 2006

RE: Comments on Memorandum from Bryce Contor to the ESHMC
Re: Scenario Discussion 29 September 2006 (SWE Project No. 165.02.MT)

As requested by Rick Raymondi in his email of October 18, 2006, this memorandum was prepared to provide comments on the referenced memorandum from Bryce Contor regarding development of the proposed Current Water Use Practices Scenario. This is a new scenario to be analyzed using the Eastern Snake Plain Aquifer Ground Water Model ("ESPAM"). In general, Bryce's memorandum accurately summarizes the discussion at the meeting. The following comments are offered using the same numbering scheme that was used in the Contor memorandum.

1. Modeling procedure - The conceptual discussion provided in the second paragraph seems to be directed primarily at reach gain responses to aquifer stresses rather than changes in water levels. In addition, references to "water budget" might be clarified as "water budget elements" or "net aquifer recharge." For instance, the first sentence of the second paragraph could be clarified to state: "Long-term Snake River reach gain responses to aquifer stresses will be driven entirely by the relative magnitude and spatial distribution of the water budget elements, and the resulting net aquifer recharge. Short-term reach gain responses will be driven primarily by starting aquifer heads." Similarly, other references in this paragraph to "water budget" should be modified to reference "water budget elements" or "net aquifer recharge."

   Consider defining what is meant by "short-term" (e.g., less than 3 years).

2. White board images - No comment.

3. Title of the scenario - Agree.

4. What the scenario is - Agree.

5. Time horizon - The first sentence might be better stated: "The Water Resource Board would like to understand the expected aquifer condition in three different time-horizon contexts." As discussed during the meeting, Item No. 1 in the list ("Prediction of the next few years) cannot be reliably determined because future hydrologic conditions are "unknown and unknowable." The best that can be done is estimate future ground water levels and reach gains under certain specified future conditions (e.g., a series of wet years, a series of average years, a series of dry years, etc.). Also, another piece of useful knowledge for the Water Resource Board would be the expected variability in future aquifer water levels and reach gains.

6. Presentation of results - Agree.

7. Representation of hydrologic sequence - Agree.

8. Current water-use and management - I agree that reservoir carryover storage may be somewhat important in determining surface water diversions. The relative effect of carryover storage (or alternatively, the actual or likely reservoir storage entering the diversion season) on irrigation season diversions varies by irrigation entity and may depend on (1) the relative amount of the entity's supply that is typically derived from storage, (2) the relative seniority of the entity's natural flow water supply, (3) the reliability of fill of the entity's reservoir storage space, and (4) other factors.

   I agree that the factors listed in the second full paragraph, had they existed in the historical record, may have influenced on the long-term record of carryover storage and its utility as an index for developing a synthetic record for purposes of the Current Water-use Practices Scenario. The potential magnitude of these factors on the historical storage record should be investigated. It may be that certain of the factors listed would have had relatively little effect, while other factors may have had opposite and cancelling effects in terms of their potential impact on the historical storage record. Note the every time the reservoir space of a particular entity filled, any cumulative effect of the factors listed would have been wiped clean.

   Finally, there are certain years in the historical record for which the factors listed would have had relatively little influence on the relationship between storage supply and diversions. For example, diversions in wet years with abundant reservoir storage entering the irrigation season would probably not be substantially affected by the factors listed. As a result, even if the historical carryover storage (or storage entering the irrigation season) is not a reliable index in all years, it may be reasonable to use in certain kinds of years. It may also be

possible to adjust the historical storage record to account for the factors listed in order to improve its utility as a hydrologic index.

The last paragraph on page 4 describes a possible alternative of "... constructing a simpler, but more robust scenario." More information on potential alternatives needs to be developed and presented in order to evaluate their reasonableness and utility.

9. Corrections - No comment.

10. Summary of details to be worked out - The list looks reasonably complete. Other items will undoubtedly present themselves as the scenario input data are developed. I believe that we can be reasonably confident in developing a scenario that reasonably predicts the long-term trends and annual variability in aquifer conditions and reach gains resulting from simulation of current water use and management practices. We have less confidence in predicting future changes in aquifer stresses and their impacts on aquifer water levels and reach gains.