



Vitae submitted to the parties on July 17, 2012 via email as part of IGWA's Disclosure of Expert Witnesses filed on July 27, 2012 ("IGWA's Disclosure"). I have over 30 years experience in hydrology, water resources engineering and water resources planning and management. I have directed or contributed to several river-basin water management studies that involved detailed inventories of basin hydrology and water demands, as well as development of planning models to investigate implications of changes in hydrology, systems operations and growth in basin water demands. My experience includes historical consumptive use analysis, evaluation of surface and ground water interactions, development of protective terms and conditions for water users, settlement negotiate and expert witness testimony.

3. I have specific experience with modeling hydrologic interconnections between ground and surface water systems in the context of water administration.

4. My professional experience also includes study and modeling in the Snake River basin. I served as a consultant to National Marine Fisheries Service on a study analyzing alternative water supplies in the Snake River basin above Lower Granite Dam to promote juvenile anadromous fish migration. My study included review of water use in the Snake River basin and computer model evaluation of potential water management strategies. I have served as a technical advisor to ground water users on Idaho's Eastern Snake Plain in various matters, including studies of historical irrigation practices and modeling of surface and ground water interactions on the eastern Snake River Plain, since 1998. For the last several years I have participated in technical review of the development, by the Idaho Department of Water Resources, of the new ground water model (the "ESPAM") of the Eastern Snake Plain Aquifer ("ESPA").

5. I am familiar with the hydrographic features of the upper Snake River basin and

the outline of the ESPA. The ESPA Model version 1.1 was developed by researchers at the IWRI over the period of 2000 – 2004. The Eastern Snake Plain Hydrologic Modeling Committee (“ESHMC”) has been reviewing, investigating and providing guidance to the researchers during development of an enhancement of the model known as version 2.0. I have participated in the ESHMC and have provided comments and input regarding such matters as model uncertainty, scope and purpose of use of the model and documentation. Improving and enhancing ESPAM and finalizing the data, computer code modules and written documentation is vitally important.

6. The provision of written documentation of groundwater models is sufficiently important to the profession that it is the subject of an ASTM Guideline (D 5718-95)

7. As evidenced in IGWA’s Disclosure, I have been retained by IGWA to provide expert reports, testimony and technical assistance in the Rangen delivery call regarding the hydrology of the ESPA and the use and application of ESPAM2.0, among other technical and scientific matters.

8. As a member of ESHMC and as IGWA’s expert, I have been in communication with IDWR and IWRI personnel regarding data and supporting written documentation of the ESPAM 2.0. Red-lined, fragmented documentation has been circulating in draft form for the past year or so but has not been finalized.

9. As a member of ESHMC and as IGWA’s expert, I understood that the Director wanted ESPAM 2.0 to be finalized as quickly as possible because of the pending Rangen Delivery Call. I expected that the final documentation for ESPAM2.0 would be complete and ready so that I could use it in my analysis of the application of the model in the upcoming

administrative hearing on the Rangen Delivery Call. I felt that if final documentation was available as late as mid- September, that it would still give me sufficient time to prepare my report by the October 10, 2012 deadline.

10. At a September 7, 2012 telephone meeting with Dr. Allan Wylie, I learned that important components of the documentation were not complete and that some had not yet been written. These unwritten components included documentation of code modules and data sets prepared by one of the ESHMC members, Rangen Inc.'s own expert. Other ESHMC members were also to provide written documentation regarding computer codes and data sets. This documentation is not yet complete.

11. The parts of the ESPAM 2.0 documentation apparently not yet written are those for the code modules MKMOD and On-Farm Algorithm. These modules control fundamental water inputs to the Model that are central to the calculation of net aquifer recharge and factor critically into the evaluation of impacts to the aquifer from changes in surface and groundwater use.

12. Additionally, there are various post-development analyses of the Model, such as the predictive uncertainty analysis, that are not yet documented.

13. On the September 12, 2012, ESHMC meeting I raised my concerns of incomplete documentation. Stacey Taylor at IWRRRI stated that she believed all of the existing red-lined portions of the draft documentation could be revised and compiled by late September or early October and submitted to IDWR for final review.

14. The fact that the ESPAM 2.0 is lacking complete documentation and that Rangen, Inc.'s own expert is a contributor of a vital portion thereof is a disadvantage to me as an expert

witness for IGWA. Rangen's experts have had the opportunity to perform work regarding application and use of ESPAM 2.0 with information that has not been available to me or to other members of the ESHMC.

15. While I am able to perform certain model analyses without the complete documentation, I am not fully confident in rendering opinions of its application or its output without reference to final documentation. I cannot provide unqualified opinions based upon incomplete, red-lined documentation in draft form. Furthermore, the missing documentation for computer code modules and datasets may compel me to make assumptions that are not entirely correct. Without the complete data and documentation for ESPAM 2.0, I may be placed in the undesirable position to have to qualify my opinions which is not what I was retained to do.

16. The quality and validity of my expert report(s) and underlying opinions may be diminished without complete scientific evidence and documentation to corroborate the ESPAM 2.0 model and its application to this delivery call.

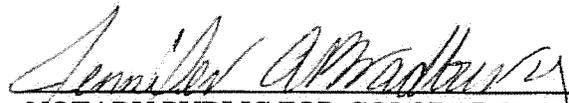
17. I believe it is reasonable that the complete final draft documentation could be provided to IDWR by mid-October and that IDWR could finalize its review and make the final documentation available to all parties to the Rangen matter by the end of November. I could then submit my opinions within one month of obtaining the final documentation.

FURTHER YOUR AFFIANT SAYETH NAUGHT.

DATED this 25 day of September, 2012.

  
CHARLES M. BREDECKE

SUBSCRIBED AND SWORN TO before me this 25<sup>TH</sup> day of September, 2012.

  
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## CERTIFICATE OF SERVICE

I hereby certify that on this 26<sup>th</sup> day of September, 2012, *Affidavit of Charles M. Brendecke in Support of IGWA's Motion to Continue Hearing* was served by email and hard copies to be served via U.S. Mail postage prepaid on September 27, 2012 to the following:

  
\_\_\_\_\_  
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