

Sukow, Jennifer

From: Sukow, Jennifer
Sent: Thursday, November 17, 2011 3:47 PM
To: 'Koreny, John S.'
Cc: Wylie, Allan; Raymond, Rick
Subject: RE: Thousand Springs-Area Calibration Flow Targets for Version 2 of Model

John,

Responses to your comments are provided in blue text below. I have revised the memorandum and spreadsheets as indicated below. I will post this e-mail with the revised documents.

Jennifer

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From: Koreny, John S. [mailto:John.Koreny@hdrinc.com]
Sent: Wednesday, November 09, 2011 9:45 AM
To: Sukow, Jennifer
Cc: Wylie, Allan; Raymond, Rick
Subject: Thousand Springs-Area Calibration Flow Targets for Version 2 of Model

Hi Jennifer

Thank you for the memo. It is very well done. We appreciate your work on this.

Our comments are mainly to help clarify things.

1. **Location Map:** All of the locations referenced in the memo are really hard to follow without a location map. This is especially true for a reader that has not visited the area and is reading this for the first time. Could we please add some location maps. I think the one that Alan prepared that shows the spring locations and the model grid cells would be helpful to explain the big picture, and it would be great if you could reference this in the first paragraph so the reader could orient themselves. Alan has another one showing the spring source locations at SeaPac that could be included to show where Bridal Veils and Hatchery Springs so that the reader can understand why these springs were broken out separately. Could you please attach these maps.

Figures 1, 2, and 5 were added to show general locations of the facilities and springs mentioned in the memorandum.

2. **Bridal Veil Springs:** Our understanding from Michelle at IDWR is that the 15-minute data is collected below Bridal Veil springs but that these measurements are not accurate. This is why we relied on the four gaging events performed since 2010. (see second attachment).

I spoke with Michelle Richman about this. The 15-minute data are not "inaccurate" but are still considered "provisional". A shift may be applied to these after additional current meter measurements are made. The 15-minute data were not used in calculation of the targets, but are mentioned in Table 1 for future reference. I have revised Table 1 to clarify the status of the data, and added a discussion of the use of the current meter measurements to apportion the SeaPac diversions between the cells on page 7.

3. **Hatchery Springs:** "Hatchery Spring" has been measured by the SeaPac staff many times and it is used to as a water supply for their facility that raises fish up from egg to juvenile fish- so they track the flow here very carefully. (If there's not enough water- the eggs would die). It is consistently between 3-4 cfs.

This is mentioned on page 7.

4. **Ten Springs:** *"Both the Ten Springs and SeaPac Hatchery data series exhibit different trends than the data obtained from the power plant. The trends of the transient data series from the hatcheries do not appear to be suitable for direct use in the ESPAM2.0 calibration target."* I don't agree that the trends or the seasonal data at the Ten Springs hatchery is unusual. It closely follows the IPCO flow data, shows normal seasonal variation and exhibits the same overall declining trend. I don't understand why we don't just use the data.

I agree that the Ten Springs diversion data trend is generally good, but there are some questionable data in 1995 and 2002-2003. I added additional discussion of this on page 5. We may use this data series directly in the future if we can get additional information for those years.

5. **SeaPac Hatchery Flow:** The memo now seems to question the accuracy of the SeaPac hatchery but it does not explain why. I think it would be better to explain why and what parts of the SeaPac flow data is unsuitable and what does seem to be correct. The beginning and end of the flow record seems correct- and since 2002 when SeaPac has been under new ownership- IDWR field staff have reviewed the data collection and verified that the flow measurements are done correctly. The SeaPac flow data series seems correct to me, except that there are some unexplained high flows for the period from about 2005 to 2007 when the other springs in the area have declining flows. Some of the SeaPac springs are lower in elevation than the IPCO springs- so there may be a good reason for this. Or it may an error. I don't know. So I do agree that there is some question about the data in this period. Could you please clarify your comments on this.

I have added additional discussion comparing the SeaPac records to the Thousand Springs and National Fish Hatchery records on pages 5 and 12. I agree that the SeaPac springs are generally lower in elevation than the IPCO springs. The SeaPac springs are fairly close in elevation to the National Fish Hatchery springs, so the comparison on page 12 is more relevant. In general, it appears the SeaPac springs may be slightly lower than the National Fish Hatchery springs, which means we should expect the seasonal amplitude and year-to-year variations to be less for SeaPac than for NFH. After 2002, they appear to be greater. Using the SeaPac transient record directly in the National Fish Hatchery cell would result in a calibration target trend that does not appear to be consistent with our other spring observations (I did try it). If we can get additional information in the future, we may use the data series directly in a future calibration. Given the information available to me today, I believe the best calibration target for ESPAM2.0 is developed using the average ratio.

6. **Division of SeaPac Hatchery Flow into Model Cells:** I think the memo may be stronger if you present the method and data that I used to divide the flow between model cells. That way- the memo is stand-alone and does not depend on my work without explaining that IDWR has reviewed it- presents it in the memo- and has adopted it.

While responding to this comment, I noticed that the spreadsheet you used to divide the flow between model cells has the diversion data offset by two months (the records start in March 1995, not January 1995). Also, I was not able to find a July 2009 measurement for Bridal Veil. To my knowledge, the first IDWR measurement was made in September 2010. I posted a new spreadsheet "SeapacRatio_11172011.xlsx" where I recalculated the ratio using the 9/2010, 11/2010, and 5/2011 measurement data provided by Michelle, the 3 cfs assumption for Hatchery Spring, and the corresponding total diversions. I came up with a slightly different ratio of 34% in the Thousand Springs cell and 66% in the NFH cell. I have edited the memorandum and the calibration target spreadsheets to reflect this change, which only shifts about 2 cfs between the two cells.

Regards-

John Koreny

HDR

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