

# MEMO

TO: ESHMC

FROM: Stacey Taylor, IWRRRI

DATE: September 21, 2011

SUBJECT:  $R_{bot}$  values in American Falls Reservoir cells as represented by the River Package

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During the calibration of ESPAM version 2.0, it became apparent that a number of river cells in the American Falls Reservoir area were not functioning properly. This issue occurred over several stress periods and the issue was commonly related to the reservoir cells that were not intended to be “wetted” by the extent of the reservoir. For a more detailed discussion on how the river cells are represented in American Falls reservoir see the design document titled “Final River Stage ESPAM2 Design Doc AS BUILT.pdf” on the IDWR ESPAM website.

The thickness of the riverbed material of the Snake River is assumed to be 30 ft as simulated by the River Package in ESPAM2.0. As a result, the river bottom elevation values ( $R_{bot}$ ) for all river cells were calculated as 30 ft below the surface of the river (or reservoir) bed for all river cells, including the river cells used to represent American Falls Reservoir. This elevation value in the reservoir was found to be too low relative to the stage value and was found to be problematic. This problem commonly occurred when the reservoir stage was between 4300 ft and 4349 ft and was never found above the reservoir stage elevation of 4350 ft (when all reservoir cells are intended to be “wetted”).

When cells in American Falls Reservoir were not intended to be covered (not “wetted”) by the extent of the reservoir for a certain stress period, the  $R_{bot}$  value in the reservoir was adjusted (increased by 30 ft) to the actual elevation of the surface of the reservoir bed. While this change fixed most cells that were not intended to be “wetted” other cells on the outer edges of the reservoir still posed a problem. The  $R_{bot}$  for these cells was increased to the elevation the river cell stage for that particular cell ( $R_{stage} = R_{bot}$ ). This allows water to flow from the aquifer to the reservoir while preventing the reservoir from losing water when it should not lose water.

These updates to the river file are found in the file titled “ESPAM2\_RiverFile\_20110920.xlsx”.