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Good morning or good afternoon,

"Residual" is the difference in feet between 819 well observations and simulations.
The above excerpt is from page 68 of GMD5.ModelReport.BGW.pdf

The residual is about 27 or 30 feet at USGS ID: 373732099013501.
USGS ID: 373832099024101 is about 1.5 miles from USGS ID: 373732099013501 so 373832099024101 probably has about the same residual.
USGS ID: 373832099024101 is in zone A (Rattlesnake Creek Streamflow Response Region), so it will need to reduce diversions. If the BBGMD5 model was modified so that the residual was 0 or 1 foot, at all locations in zones A and B, then 373832099024101 may no longer be in zone A.

Would it be possible to get the errors (or "Residual") in the BBGMD5 model (or the single-layer model) reduced to zero or one foot (in Zones A and B) for determining the stream response at the wells? If one foot is too close, how about two feet or three feet?

If the errors are corrected, then it's possible that no reduction in diversions will be needed at USGS ID: 373832099024101 and at other wells near 373832099024101.

In the peer review (GMD5.ModelPeerReview.SSPA.pdf), I didn't see where they discussed the effect of the residuals on the accuracy of the stream response at specific wells. Maybe they didn't discuss it since there was no "Rattlesnake Creek Streamflow Response Region" in the BBGMD5 model.

If the large residuals in the model will be reduced (or eliminated), could another piece of information be included in the model?
Could the ground water elevations be measured every year at USGS ID: 374014099034301 and USGS ID: 374116099022501 and included in an updated version of the model in 5 years?
The measurement method would need to meet KDA-DWR requirements; can Rosencrantz-Bemis do it?
Or could I pay KDA-DWR to measure the ground water elevations every year at USGS ID: 374014099034301 and USGS ID: 374116099022501 (if they can be included in an updated version of the model in 5 years)?
The ground water elevation was about 2040 in 1987 at USGS ID: 374014099034301
The ground water elevation was 2048.25 on JUL 29-1987 at USGS ID: 374116099022501
If the ground water elevations at USGS ID: 374014099034301 and USGS ID: 374116099022501 could be included in an updated version of the model and if the errors or "Residual" in the BBGMD5 model can be corrected, then USGS ID: 374014099034301 (and adjacent wells) may no longer be in Zone A.

The errors or “Residual” in the BBGMD5 model balance each other out when looking at the “overall performance of the model” (is how I interpret the excerpt from page 68 of GMD5.ModelReport.BGW.pdf).

The model is fine for estimating the flow at the zenith gage, but not for determining the stream response at specific wells (at locations) where the model has a large error (or “Residual”). Correcting as many errors (or “Residuals”) as possible (in Zones A and B) would help.

The excerpt below is from page 68 of GMD5.ModelReport.BGW.pdf

“Residual” is the difference in feet between 819 well observations and simulations. Positive residuals indicate the model is simulating higher than observed; negative means lower than observed. The average and mean simulation trends are two or three feet higher than observed water levels; the cumulative change in residual accumulating the overall performance of the model through the years is near zero. One-fifth of wells are simulated about five-feet low and one-fifth are simulated about ten-feet high. A summary of observed and simulated water-level changes model wide during the historical period from 1940 through 2007 is shown on Figure 47.
https://sftp.kda.ks.gov:4443/impairment/RSC.Quivira/TechReport.Attachments/GMD5.ModelReport.BGW.pdf

Excerpt below from page 3 of GMD5.ModelPeerReview.SSPA.pdf
We collapsed the 7-layer representation in the BBGMD5 model into a 1-layer representation to demonstrate that, for many purposes, the 1-layer representation can be used to obtain the same results that were obtained with the 7-layer representation and to facilitate evaluation of model performance.
https://sftp.kda.ks.gov:4443/impairment/RSC.Quivira/TechReport.Attachments/GMD5.ModelPeerReview.SSPA.pdf

The errors (or “Residual”) in the BBGMD5 model remain in the model used by KDA-DWR is how I interpret the excerpt below.

Excerpt below from page 41 of final-impairment-report-quivira-20160715.pdf
Conversion of the multilayer BBGMD5 model into a single-layer model involved primarily equating the aquifer property of transmissivity of the single-layer model to the sum of transmissivity over the seven layers of the BBGMD5 model. Evapotranspiration and recharge inputs for the single-layer model are the same as those for the BBGMD5 model. The single-layer model version was found to be a satisfactory substitute for the BBGMD5 model, based on comparisons of global water budgets, computed water levels and streamflow. It has the advantage of shorter run times of 30 to 60 minutes for the historical simulation on KDA-DWR computers. The single-layer model version was used to evaluate the pumping scenarios described here, one of which (Scenario 11, below) was run with both model versions to compare computed pumping impacts.
http://agriculture.ks.gov/docs/default-source/wms---impairment-reports/final-impairment-report-quivira-20160715.pdf?sfvrsn=4

Stream Response (Percent) is based on the BBGMD5 model with the errors (or “Residual”) like the one below. The blue diamonds would match the green lines if there was no error in the model.
http://agriculture.ks.gov/docs/default-source/dwr-water-appropriation-documents/quivira_response_22x34_20170804.pdf?sfvrsn=0
https://sftp.kda.ks.gov:4443/impairment/RSC.Quivira/TechReport.Attachments/GMD5.ModelReport.Appendices.BGW.pdf

Below from pdf page 182 of 225, GMD5.ModelReport.Appendices.BGW.pdf

1656 is the same as USGS ID: 373732099013501

General Well Site Information

USGS ID:	373732099013501	**KGS Local Well ID:**	28S 16W 12BCA 01
County:	Kiowa	**PLSS Description:**	28S 16W 12 NESWNW

http://hercules.kgs.ku.edu/geohydro/wizard/wizardwelldetail.cfm?usgs_id=373732099013501