MTAC Meeting Notes from August 1, 2013

Introductions were made, and an attendance list was circulated. The following were present at the meeting:

Jim Bartolino (USGS)
Ernie Carlsen (Idaho Water Engineering)
Jason Fisher (USGS)
John Gaeddert (BCSD/CLPE)
Tom Hellen (Hailey)
Jennifer Johnson (BOR)
George Kirk (Mid Valley Water Co.)
Kevin Lakey (WD 37)
Wayne Martin (self)
Pat McMahon (SVWSD)
John Miley (self)
Neeley Miller (IDWR)
Christian Petrich (SPF/Hailey)
Erick Powell (Brockway Engineering)
Lawrence Schoen (Blaine County)
Jennifer Sukow (IDWR)
Sean Vincent (IDWR)
Allan Wylie (IDWR)

Item 1 – Modeling objectives update/discussion (Sean Vincent)

Sean Vincent gave a presentation discussing the modeling objectives and the comments that have been submitted regarding the modeling objectives. Sean prefaced his comments by stating that IDWR and USGS encourage active participation from all MTAC members and reiterated that his comments are intended to generate discussion by the Committee. Sean's summary of the comments focused on three specific comments, 1) the need to prioritize objectives (facilitating Conjunctive Administration is #1 objective), 2) objectives are too broad/vague (be more specific), and 3) preliminary 100m x 100m grid is too coarse.

In response to #1, Sean suggested there isn't necessarily a need to prioritize objectives because design requirements for the various objectives do not appear to be in conflict. He indicated that facilitating Conjunctive Administration is an important objective for IDWR, but not necessarily so for the entities providing most of the funding for the project.

In response to #2 Sean agreed that draft objectives are not overly specific, but he believes they are nonetheless accurate and useful for selecting code/solver/stream package, delineating model domain, and establishing requirements for defensibility and documentation. Sean added that the modeling objectives also identify what we will not need the model to do – evaluate well-to-well impacts. Sean questioned the need for increased specificity because we don't know what Conjunctive Administration will look like - and it's not our job to decide. Sean said that the best we can do is look at the ESPAM requirements. In regards to spatial and temporal discretization, Sean stated that we will likely be constrained by data availability, not by objectives.

In response to #3 Sean said 100m grid spacing likely exceeds the defensible level of refinement based on the density of calibration data. Sean ended his presentation by mentioning that local grid refinement is relatively easy with MODFLOW USG.

Erick Powell thanked Sean for his presentation and followed-up by saying that his comments are based on the idea this model will be heavily scrutinized both technically and legally. He said that a planning tool is a great tool, but most of the scrutiny is going to come about because of Conjunctive Administration not because the model is a planning tool.

Sean indicated that we must satisfy all objectives and said that he doesn't believe prioritization (of one objective over another) would result in the creation of a different model.

Christian Petrich asked Sean if he wanted to leave design objectives in their current form.

Sean indicated that he would like the group to have a discussion of this issue and see where we end up.

Lawrence Schoen made the comment that people are going to ask the question "What impacts is a specific well having on my water right?" or something similar. He's already getting questions like this and thinks we need to be prepared for these types of questions.

George Kirk commented, that from his experience on other projects, having the objectives as tight as possible ends up helping the process down the road. From his perspective the reason we are here is because of the implementation of Conjunctive Administration. He said he would lean towards being more specific in the objectives and prioritizing them.

Christian said that he appreciates all the comments and stated that his goal with his comment was to suggest the modeling objectives be tightened-up. He said that if we don't tighten the objectives up, we may end up not focusing on the key elements

throughout the modeling process. Christian stated that he is happy we are revisiting these objectives and thinks some of the comments reinforce his suggestion that Conjunctive Administration is the primary objective.

Allan Wylie stated that he is comfortable with the objectives as they currently exist.

Jennifer Sukow echoed Allan's comment. She is comfortable with the objectives as they are because Conjunctive Administration is on equal footing with the other objectives.

Jason Fisher followed-up up Jennifer's comments by stating that in the case of the Wood River Valley many of the model assumptions, scenarios and data availability (temporal and spatial) issues are going to drive how the model works, not necessarily the modeling objectives.

Christian said that in addition to the vagueness of this objective he also concerns with Conjunctive Administration being listed as the sixth objective on the list. He feels a more specific goal related to conjunctive administration would be "Simulate and quantify (a) the effects of depletions at different aquifer depths from various parts of the valley on nearby and distance surface channels; (b) the effects of managed recharge on surface channels in various parts of the valley; (c) the effects associated with point-of-diversion transfers.

Christian added that the reason for emphasizing the importance of this objective is to (1) focus the modeling efforts and (2) provide context for a future model challenge. For example, someone could challenge the mode in the future by saying that the model was built for general purposes (planning tool, etc.), and that providing a tool for conjunctive administration was only an ancillary objective and therefore the model isn't appropriate for use in administering water right 37-xxxx.

Erick followed-up Christian's comment by saying his concern was that Conjunctive Administration was only mentioned twice in the objectives. His concern is down the road with scrutiny and he believes being specific now may help us deal with potential scrutiny of the model in the future. He added that maybe some of the model design decisions will be easier to understand as the Committee becomes more familiar with the data.

Sean mentioned that Erick raised a great point about the Committee becoming more familiar with the data as we move forward.

Erick added that he thinks it is important for us to be very clear about the gaps in the data.

Christian asked Sean if he would be willing to take another shot at modifying the modeling objectives based upon the elements that were just discussed.

Sean indicated that he would be willing to make some modifications to the existing modeling objectives and he would report back to the Committee at the next meeting. Jim Bartolino also agreed to review the objectives prior to the next meeting.

Item 2 – Design Memo Format/Base of Aquifer Map (Jim Bartolino)

Jim Bartolino briefed the group on the Design Memo format. He described the design memo as a brief intermediate/preliminary description of major model decisions and processes. The purpose of this document is to make decisions transparent, facilitate discussion, and to ease preparation of the final report. Jim indicated these are going to be preliminary, draft, status reports and they are not intended to be finalized. Instead, the final version will be the model report put together by USGS at the end of the project. Jim proposed a format for the design memo that includes a statement of problem/issue/need and documentation of the design decision – a technical description of decision including rationale. He reminded members of the committee that a draft design document had been posted on the project website. In closing, Jim presented and discussed his revised base of aquifer map.

Jim opened discussion by asking the Committee if they have any comments on the format of the draft design document.

Christian commented that he is very pleased with the draft design document. He would add a description of the choice not made in considering how to address a particular issue/problem. For example, what was the rationale for not selecting one alternative over another in addressing an issue?

Erick said that he is also very pleased with what he saw in the draft design document. He would echo Christian's suggestion of providing a rationale for alternatives not selected.

Christian mentioned that he would like to have meeting notes posted two weeks after each meeting. In addition, prior to future meetings, he would like to receive an outline of each presentation and data for each presentation so participants can come to the meeting prepared to engage in discussion. He believes these elements (design memo's, meeting notes, and receiving information prior to meetings) will make this group more effective

Items 3 – Reach Gain Analysis (Jim Bartolino and/or Jennifer Sukow)

Jim Bartolino provided the group with a presentation of Wood River Valley streamflow measurements for gaining and losing reaches. He briefed the Committee on three streamflow gain/loss measurements that took place in August 2012, October 2012, and March 2013. He indicated there were 13 measurement sites on the Big Wood River, 2

sites on Silver Creek, 24 sites on tributaries, and 13 sites on canals. Jim showed the Committee a spreadsheet showing examples of how he is documenting streamflow gain/loss measurements. Jim closed his presentation with a line-graph illustrating rough gaining/losing reaches of Big Wood River based on data from the three mass measurements.

Jim asked the Committee if they are comfortable with the format of the streamflow gain/loss measurements he showed during his presentation.

Christian indicated that he was comfortable with the approach and said that he likes how Jim is tracking the level of measurement uncertainty.

Lawrence asked Jim if he picked those particular dates for the mass measurement for a reason.

Jim said that we are constrained by time and money and would love to have additional data, but he indicated we have measurements for both the irrigation season and non-irrigation season and he believes that should be sufficient.

Lawrence asked Jim if only having one data set during the irrigation season makes sense.

Jim said that's a great question and said that is something the modelers have struggled with.

Jennifer Sukow gave a presentation to the Committee providing information on preliminary reach gain calculations. She discussed the WRV seepage data from 2012-13. Using these measurements she identified and discussed the gaining/losing/seasonally gaining or losing reaches of the Wood River. Jennifer also discussed data availability for continuous recording gage stations and showed regression analyses used to fill data gaps. She also discussed using StreamStats to estimate spring/early summer contributions from ungaged tributary streams in the near Ketchum to Hailey reach.

Jennifer discussed spring/early summer spikes in the near Ketchum to Hailey and Hailey to Stanton Crossing reach gains that appear to result from contributions from ungaged tributary streams. She discussed options for addressing these spikes, such as deducting spring/early summer contributions using StreamStats, using only October to March reach gains for model calibration, or using only reach gains during periods when the Hailey gage is less than 300 cfs. Jennifer asked the Committee if they have any thoughts on approaching the reach gain calibration targets.

Erick commented that the data is amazingly consistent. He suggested that instead of trying to get yearly targets, we could consider using annual mean.

Erick asked Jennifer what the model reaches are going to be.

Jennifer suggested that the reaches with time series targets will be near Ketchum to Hailey, Hailey to Stanton Crossing, Willow Creek, and the spring creeks above Silver Creek at Sportsman Access. Information about gaining and losing subreaches of the Big Wood River learned during the 2012-2013 seepage study may be used to establish ratio targets for periods with flow conditions similar to those measured during the study.

Christian asked if there is any older data that may be useful for this effort.

Jennifer said some older data may be useful, but she indicated she wasn't sure how this is going to help us with model calibration.

Christian agreed, but he thought it could be useful in getting a sense of the long-term trends.

Item 4 – Break

Item 5 (Working Lunch) – Precipitation and ET (Allan Wylie)

Allan Wylie provided the Committee with a presentation on options for estimating precipitation and evapotranspiration in the Wood River Valley.

In regards to precipitation, Allan proposed developing three precipitation zones: Ketchum zone, Hailey zone, and Picabo zone. He said that data is only available 2005-2010 for Hailey, so he proposed to use regression to calculate Hailey data when it is not available (1995-2005).

In regards to ET, Allan indicated that METRIC is a widely accepted method for computing ET, but we don't have METRIC available for the WRV for all years. Allan said this means we will need an estimation method for the non-METRIC years. Staff had previously proposed ET Idaho (aka Standardized Penman-Monteith or Crop coefficient method) for non-METRIC years and north of Bellevue Triangle, but we've since spoken with Rick Allen (developer of METRIC) and he says METRIC is useful for entire study area.

Allan mentioned that the Normalized Difference Vegetative Index (NDVI) is another option for estimating ET for non-METRIC years and that it's particularly appealing because we don't have to estimate crop mix. Allan explained that plants absorb solar radiation in the photosynthetic active radiation spectrum and reflect solar radiation in the near-infrared spectrum. He added that live green plants are dark in the photosynthetic active spectrum and bright in the near-infrared spectrum. Allan indicated the ratio (NIR-VIS)/(NIR+VIS) is referred to as NDVI. Some benefits of using

NDVI are: 1) non-reliance on both crop mix data (poor quality) and the assumption of standard crop conditions, 2) the NDVI equation was developed by Dr. Allen for use in southern Idaho, 3) consistent scale and data format for processing, and 4) quicker and easier processing.

Allan concluded his presentation by proposing we use METRIC for estimating ET when it is available and use NDVI for estimating ET when METRIC is not available.

Lawrence asked Allan if he is suggesting that precipitation near Picabo is similar to near Ketchum.

Allan clarified that he wasn't trying to suggest precipitation near Picabo is similar to Kechum. He said we are creating three zones (near Ketchum, Hailey, Picabo) to avoid over/under estimating precipitation throughout the model boundary.

Christian asked Allan to clarify if he plans to use NDVI when METRIC is not available.

Allan indicated he (and Mike McVay) plan on using NDVI when METRIC is not available. Allan added that in some situations clouds make METRIC impossible to use, but he is still able to use NDVI.

Christian asked Allan why we shouldn't use NDVI for all years.

Allan said that METRIC is better because it's a direct calculation, whereas with NDVI we use crop coefficients to calculate ET.

Erick asked if there are years where you can't estimate ET using METRIC or NDVI.

Allan indicated that there are situations where you cannot use METRIC or NDVI because of clouds. He said that if we encounter that we may attempt to interpolate between 2 years using partial year NDVI.

Christian asked Allan how ET would correlate with the water years.

Allan indicated that cloud cover is more likely to be a problem in wet years than dry years.

Item 6 –Representation of Mixed-Source Lands (Jennifer Sukow)

This agenda item was skipped.

Item 7 – Model Boundaries/MODFLOW USG (Jason Fisher)

Jason discussed his work to construct the model to date, particularly his efforts on describing model boundary conditions for groundwater inflows along the tributary valleys and groundwater outflow beneath Stanton Crossing and Silver Creek, and his efforts to simulate steady-state conditions using the USGS numerical model MODFLOW-USG. The simulation is failing to converge, possibly due to an incomplete representation of boundary conditions; however, the issue with model cells going dry has been resolved with the MODFLOW-USG. Jason will move forward with modeling by re-examining his representation of tributary valley inflows in the model and incorporating streamflow boundary conditions.

Erick asked if we are creating extra work and data stability issues by trying to model up the tributaries.

Jason said to remember that we have data up to these source points. He indicated that because of a lack of temporal data he is currently using fixed heads at the tributary locations.

Erick asked if Jason has considered using a constant flux instead of a fixed head at these locations.

Jason said we can do that and may have to, but at the moment he is planning on sticking with fixed head.

Christian suggested that Jason consider having multiple cells with a fixed head in the wider tributaries.

Jason said that's a good point. He may end-up doing that. The other option he would consider would be to move higher in the tributaries.

Christian indicated he is concerned with the amount of removed cells at the mouth of Quigley Creek.

Jim said he also had concerns because that doesn't look right. Jim said he and Jason will revisit this element and suggested maybe something is wrong in the bedrock base map. Jim added that Cove Creek could be another one he and Jason have to revisit.

Jason said that he is also going to have to revisit the Poverty Flats underflow boundaries.

Erick commented that he would strongly recommend that Jason avoid modeling any of the tributaries as "no flow."

Item 8 – Break (skipped)

Item 9 – Municipal Pumpage and WWTP Discharge

We did not have enough time for this agenda item. Jim said we will hold this presentation for the next meeting of the MTAC. Jim did say that we are in good shape on municipal data, but he is still waiting on data from Bellevue.

Item 10 – Next Steps, Action Items

The committee agreed the next meeting should be held at the Community Campus in Hailey, Idaho on October 3rd from 10am until 3pm. Jim suggested that we might want to include a field trip in conjunction with the next meeting. Jim suggested we visit sites around the WRV on October 1st and 2nd. He will put together a list of places to visit and send it out to the MTAC e-mail list.