Nowakowski, Sonja

From: Mohr, Jason
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To: Nowakowski, Sonja
Subject: FW: Suggested Issues for the CSKT Compact Technical Working Group(TWG) to Address

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From: Jerry & Christine Laskody [brknhkrnch@stignatius.net]
Sent: Wednesday, June 18, 2014 2:19 PM
To: John Metesh; Mohr, Jason
Cc: Kate Vandemoer ; 'Jon Metropoulos'
Subject: Suggested Issues for the CSKT Compact Technical Working Group(TWG) to Address

Gentlemen:
While I did not attend the last TWG mweeting on June 12, I did spend some time doing a bit of research on ET's ,weighing lysimeters,etc as well as thinking about what I have hear during Bill Grieman's presentation and reviewing the presentation made by Seth Makepeace and Wade Irons via the video. I have tried to collect my thoughts on issues I find to be important from the agricultural irrigators point of view. I will list them and provide a brief discussion on each topic.

Once again, I'd like to thank the Chairman and the working group memebers for graciously allowing me to actively participate in this process and for their patience in answering my my frequrent questions.

Jerry Laskody
St. Ignatius, MT

1. Uncertainty Analysis
The single most important thing that stands out for me is the lack of an uncertainty analyis to indicate what accuracy the water allocations can be expected to have.When you specify a water allocation and then force the irrigators to use flow meters to measure their individual deliveries, you must know that the allocation has a low value of uncertainty at a high degree of confidence. An erroneously low allocation can put an irrigator out of business in short order. Knowing the uncertainity can help the negotiating process by assuring that negotiated allocations have a high degree of confidence in being believable.

I worked in the world of uncertainties of +/-1% at the 95 % confidence level. I know that in the world that the members of the Technical Working Group work in, the uncertainties are much larger. In my professional experience we were able to eliminate bias errors by having reference standards that would allow us virtually zero out bias errors. In stream flow

measurements I believe that is a bit more difficult but it must be done in order to quote absolute levels that are meaningful. Any uncertainty analysis must propagate through the entire determination process to the final result.

In the Compact's water allocation determination, remote sensing data taken during satellite "drive bys" provided infrared instantneous snapshots of the region over a three year span. These data were then compiled from three the different water years to make up a "composite single year's" irrigation season. How accurate is that for a process that has a random error range of 5%-20% (Ref 1)? What are the bias errors and the random errors for this?

These are serious questions that in my opinion, need answers. We can all make calculations but there is a need to determine how accurate the absolute level of the end results are. We only get one shot at this and the irrigators have to live with it!

2.Management Factor

The management factor that is applied to evapotranspiration numbers is a new term for me. In both the irrigation guides that I used (Ref 2,3), there is no mention of this factor for scheduling irrigation. DNRC 36.12.1902 utilizes this factor, on a county by county basis, for determining water right changes in the absence of other data. In my opinion, it has no place in determining allocations in this adjudication process. It is a "one size fits all" number that does not take into account individual landowner cropping plans and locks the use of water to a fixed value dependent on present use. This factor is not used in the developing the recommended pratices for irrigation scheduling by both the Bureau of Reclamation and Montana State University.

3.0 Irrigation Efficiency

I had a hard time seeing the numbers presented by CSKT/HKM because they were blurry on the video but what I thought I saw was an increasing trend in irrigation efficiency from May through September with high values of 80-85%. These are unreasonably high levels of sprinkler efficiency. Higher levels may ocurr during few hours at night but on a hourly weighted basis they would not be a significant factor for a daily level of irrigation efficiency. My observations show the opposite trend from the CSKT presentation. In the cooler parts of the year the effciencies are higher due to low temps and high relative humidities. As we proceed into the July August time period, hot, windy conditions and low relative humidities are prevelant with attendent low levels off irrigation effciencies. September is a" toss up". Some years it is hot and dry and some years it's cool.

Irrigation guides (Ref 2,3) recommend 65% effciency for sprinklers. This is a higher number than I think is justified by weather conditions in the Flathead Project but I certainly don't believe anyone can justify levels of irrigation efficiencies greater than 70%.

4.0 Cropping Patterns

The Compact water allocations were determined by determining exsiting cropping patterns, calculating crop water usage via ET calculations and claiming this is "historic usage".This "locks in" the water allocations to whatever cropping pattern existed in the study years. These lands are owned in fee and cropping is determined by the individual parcel owners based on agricultural economics, soil types,weather and water availability, among others . As lands change hands, individuals are able exercise other cropping options. This is supposed to be an irrigation project. That means it's pupose is to maximize delivery of irrigation water for beneficial agricultural production. Locking in a cropping, and the the water allocations to maintain that cropping pattern is in this fashion is a restriction on property rights.

Additionally a court said that there may be a requirement to maintain a fishery and so interim instream flows were set in the mid-1980's that must be adhered to until this issue is finally settled. Today, as I understand it, the Project provides 270,000 acre ft annualy for instream flows. The Compact provides for 179, 000 acre ft for the Flathead Irrigation Project and all additional water that accrues from Project improvements increases the instream flows. Present instream flows are 50% greater that proposed water deliveries and Project improvements only accrue water to instream flows in the Mission, Flathead and Jocko Districts and thus the proportion of water available for irrigation deliveries will shrink further. Where is the justification for this?

While these are not strictly speaking , technical issues" but the phillosphy behind them sets the stage for the analysis methodology biased highly in favor of increasing instream flows only and it does this, at least partially, by locking in cropping patterns to those that exist today.

5.0 The Details
There is an old saying, "…the devil is in the details'' and I have seen some calculation details that to me appear appear to me to be inconsistent. The use of the Montieth equations (some times referred to as Montieth-Penamn) for ET calculations rather than the more common Kimberly-Penman equations, the determinnation of yearly average ET's over a larger range of years than the study years and the all ready mentioned use of a "management factor'" for reducing crop ET's are the ones that first come to mind.

In Reference 4, comparisons of weighing lysimeter data indicate two significant issues: 1) there is a positive bias in the calculated ET's relative to the measured ET's and, 2) The average deviation of ET's relative to lysimeter measurements using the ASCE/EWRI (modified Penman-Montieth) are somewhat greater than those using the Kimberly -Penman equations. This would suggest the calculated ET's are greater than weighing lysimeter values and that the Kimberly-Penman equations are a closer approximation to the weighing lysimeter values.

Notwithstanding that this is just one study with limited data , it would suggest that for consistency, the selection of the actual ET calculation methodology should be justified by some analysis rather than by arbitrary choice

6.0 Adaptive Managemment, Maximum Water Use Allowance, Consensual Agreements Much has been made of the so called Adaptive Management section of the Compact to correct deficiencies in water allocations. However the compact wording is such that it is all "good intentions" but not very substantive. To be of practical use, there must be an agreed upon process to quantitatvely determine the adequacy of water allocation and a specific remedy when those allocations are determined to be inadequate. This cannot be left to "mutual agreement" because in the heat of a disagreement, it's easy for one party to say they don't agree and walk away leaving the wronged party with no recourse but the Courts. By quantitatively defining what success is, each party signs up to that definition. If the definition is met then there are no consequences. If it is not, the specific remedy process will quickly allow the remedy to be put into effect. This all mutually agreed to before the problem is determined to exsist. This is how Boeing managed guarantee compliance for commercial aircraft propulsion systems and wrote or was responsible for many of the deterministic methodologies that were utilized. I made this type of proposal to the Compact Commission and the Flathead Joint Board of Control that existed in 2012 and never received a response.

Similarly with the Maximum Water Use Allowance. It is an ill defined proposal that had a specific waiting period (5 years) but had non-sprecific components to it. It limited maximum water to a maximum 2ac-ft/ac and did not change the 179,000 ac ft per year Project limitation so it amounted to no more that taking water from one irrigator to give to another. As I stated above, I would propose a specific process for obtaining additional water with a deterministic method for developing the additional ammount. My historic use as a double duty irrigator is all ready 2+ ac-ft/ac/year and I would have to wait five years to "apply" for an" increase" via this proposal. What would I do with my cows while I await for this to occur?

Finally there is the issue of "consensual agreements" with the CSKT. These are private contracts that allow parties to make contracts with the Tribe that circumvent the Compacts provisions. It goes without saying that these should not even be allowed in a Compact document.

7.0 Disagreement Between My Actual Irrigation Usage and the Compact Water Allocations I really didn't hear any disagreement between results of my paper and Mr. Irons evaluation of it. Was that wishful thinking on my part?

References:
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2. “Agrimet Irrigation Guide”, US Bureau of Reclamation Agrimet Website “Crop Water Usage- SIGM- 2012” US Bureau of Reclamation Agrimet Website Irrigation Water Management

3. "When and How Much to Irrigate” Montguide MT8901, Revised September , 1990

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