

Approved April 29, 2008



**Hydrology Committee Meeting  
Farmington Civic Center  
December 4, 2007  
9:00 am – 3:00 pm**

**Member/Alternates Present**

Pat Page, Chairman  
Ray Alvarado  
Rick Cox  
Steve Cullinan  
Dan Meyer for Dave Frick  
Steve Harris  
Aaron Chavez for Randy Kirkpatrick  
Chuck Lawler  
Earl Dixon  
Bill Miller  
John Simons  
Brian Westfall  
John Whipple

**Not in attendance**

Ron Bliesner  
Mike Hammon  
Randy Seaholm  
Jeff Cole  
Pat Turney  
Dale Wirth

**Program Management**

Dave Campbell  
Sharon Whitmore

**Other Interested Parties**

Jim Brooks  
Dave King  
Brent Uilenberg  
Rege Leach  
Catherine Condon  
John Leeper

**Representing**

U.S. Bureau of Reclamation  
State of Colorado  
Water Development -NM  
U.S. Fish and Wildlife Service, Region 2  
Jicarilla Apache Nation  
Water Development – CO  
Water Development - NM  
Southern Ute Indian Tribe  
Navajo Nation  
Southern Ute Indian Tribe  
U.S. Bureau of Reclamation  
U.S. Bureau of Indian Affairs  
State of New Mexico

Keller-Bliesner Engineering (BIA)  
Jicarilla Apache Nation  
State of Colorado  
Navajo Nation  
State of New Mexico  
U.S. Bureau of Land Management

U.S. Fish and Wildlife Service, Region 2  
U.S. Fish and Wildlife Service, Region 2

U.S. Fish and Wildlife Service, Region 2  
U.S. Bureau of Reclamation  
U.S. Bureau of Reclamation  
U.S. Bureau of Reclamation  
Southern Ute Indian Tribe  
Navajo DWR

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Michael Howe  
Steve Lynch  
Mark Miller  
Ryan Christianson

U.S. Bureau of Indian Affairs  
U.S. Bureau of Indian Affairs  
City of Albuquerque  
U.S. Bureau of Reclamation

**Introductions and review and approval of agenda items** – After introductions, the following items were added to the agenda: CC conference call (Agenda Item #7) and report on move from Solaris to Windows format for Gen 2

**Review and Approval of June 12, 2007 Meeting Summary** – Approved

**Review and Approval of September 11, 2007 Meeting Summary** – Approved with several minor changes.

**Review of Action Item Log** - See attached log

It was noted all completed projects should be moved to the “Completed Projects List.”

Item #140, *Follow-up on (USGS) gage at Archuleta right-of-way*, was deleted. Rick Cox had expressed concern regarding what happens if ROW for gage is lost. USGS was not interested in pursuing long-term ROW agreement and the issue isn't a priority for Reclamation at this time.

Item#143, *Ron will send Firm Yield Study 1989 Addendum and the model comparison results table to NM and CO on concerns with Gen3*, was deleted. Two items, 1) *firm yield for San Juan Chama* and, 2) *Model comparison*.

Items #145, 146, and 149 – Alvarado still working on these ones.

Item #150 – Completed via Whipple's San Juan-Chama report.

Item #151 – Dave King pointed out that this one has been completed but is also a part of ongoing Items #5 and #12. Completed and incorporated into #12.

Items #152 -154 - Completed

Items #155 – Come back

Item #156 – Still valid but needed some modification. Modified accordingly: *Provide a memo to CC addressing the issues with the model in which the CC had concerns with, resulting from Tom Pitts memo dated 7-10-07*; Responsible party is HC; Due Date is undetermined

**Budget and Status Report** - Reclamation announced that Ryan Christianson will replace John Simons who will be retiring in June 2008. Dave King may also be retiring in 2008. A committee member asked to what extent was Riverware being used by Reclamation. The answer was that it is being well used. Page explained that the Reclamation is actively preparing for life after Simons and King. He said it is important to resolve some of the issues now while institutional knowledge is still in place. He reported \$16,000 did not get spent in 2007 but Reclamation anticipates spending all of the FY2008 budget. Page

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said he would get a budget status report out to the HC.

**Nomination of new Bureau of Reclamation Representative for Hydrology Committee** - Page announced he was resigning his chairmanship of the HC after six years but would finish out this meeting. He asked for a vote to approve Rege Leach as his replacement. It was approved. Leach introduced himself and said he was in Reclamation's Planning/Environment Division. Page indicated he would still be involved as his group still has responsibility for modeling and reservoir operations.

**Discussion of Gen3 Model Issues and How to Proceed with Model Development** - Page reported that a CC workgroup met the day before to address hydrology model issues. King provided two handouts, a previous SJR Basin Hydrology Model presentation for comparison purposes and a write-up titled *Nov. 2007 Model Work Completed Since April 2007*. Page indicated he did not want the group to spend too much time on each issue to keep things moving along. Ray Alvarado asked about the CC issues. Jim Brooks said the CC decided to use Gen2 until outstanding issues with Gen 3 are resolved, to continue developing Gen3, and to direct the BC to begin the flow recommendation revision. He said implementation of Gen3 will not occur until after the flow recommendations are revised. Bill Miller stated the flow recommendations are done independent of the model, i.e., the flow recommendations do not rely on the model, the model relies on the flow recommendations. There were differing opinions about whether or not the model and flow recommendations needed to mesh. Brian Westfall pointed out that the flow recommendations were based on a lot of research that was conducted prior to 1999. Campbell pointed out the flow recommendations were based on a lot of assumptions that are being tested now.

The group decided to discuss the CC's list of issues first. There were two main technical issues discussed, San-Juan Chama and baseline depletions. The process for resolving the methodology for computing irrigation depletions using either the original Blaney-Criddle method with high altitude crop coefficients or the modified Blaney-Criddle method with standard crop coefficients for native pasture above 6,500 feet elevation in Colorado is to have Reclamation and Colorado get together and determine which approach gives the most reliable determination of these high elevation pasture irrigation depletions. The Bureau's estimates, working with Colorado, should reflect appropriate consumptive uses/losses in Colorado. Westfall asked if there was some agreement on San Juan-Chama since the CC separated them into two issues. The CC was informed that the HC was working on the San Juan Chama issues and would report to them.

King explained Reclamation had changed some of their previous near-term recommendations (page 6 of the PowerPoint presentation handout) based on Whipple's recommendations. Whipple described his issue regarding lack of soil moisture in StateMod. Alvarado said soil moisture is in StateMod but Reclamation turned it off. King said it was turned off because Riverware does not include it.

King told the group to make the following change to Page's 11-6-07 *Status of SJR Hydrology Model Summary*: Page 1, last paragraph, first sentence: change 2006 to 2005. He went through data adjustments made to Gen3 (see attached *Nov. 2007 Model Status Work Completed Since April 2007*, handout). He pointed out that lagging surface return flows were on a daily basis in Gen3 and he would provide a description later. He mentioned that they are not shorting San Juan-Chama any longer because of some adjustments made to natural flow estimates and Azotea Tunnel errors that were in Gen2. Whipple questioned the "Initial Storage" value of 59,000 af and "Average Annual Diversion" value of 105,294 af in the *Summary of SJR-Chama Studies* table on page 2. He does not think the data is reliable prior to 1936 and has recommended that Reclamation use NM's numbers for 1936 through 2005 in

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combination to achieve a 105,200 af average annual diversion. He does not agree with Reclamation's methodology although the results are similar.

Page asked the group to review what Reclamation has done with San Juan-Chama to see if they think the adjustments resolve the issues and provide comments. Whipple indicated he still has concerns with how it is being modeled. Westfall said the annual differences between Reclamation's methods and NM's methods for depletions during the 1936 through 2005 time period should be compared. King said that to do that he would need to get Whipple's numbers electronically but would not be able to insert them into the model directly because they are not consistent with the rest of the model. There was some disagreement and additional discussion about inserting Whipple's numbers into the model.

Brooks reiterated that the main technical issues are with historic depletions and San Juan-Chama and that the CC wants the HC to describe their process for completing Gen3. He said no response from the HC is not an option. He urged the group to use their voting procedures for dealing with issues where there is disagreement.

Steve Harris suggested they include Whipple's numbers for flows for San Jaun-Chama and turn-off San Juan-Chama. He said it makes no difference to the San Juan River because San Juan-Chama is on a daily time step but below Navajo Dam is monthly. Cullinan thinks doing this would make the model less robust. Harris moved that New Mexico's San Juan-Chama diversions for 1936 to 2005 be hardwired for determining natural flows and operations, for 1929 to 1935 use the average 105, 200 af, and use actual diversions after 2005. King said he would need Whipple to provide seven time series:

- Estimated historic flows @ 3 diversion points (Blanco, Navajo, and little Navajo)
- Operated numbers @ the 3 the diversion points
- Azotea Tunnel

Harris moved, Cullinan seconded, no nays, motion carried.

Harris moved that Gen3 is ready to go and should be implemented now. He said after the flow recommendations are revised, the model can be revisited. He also stated it should be accepted that the states will provide their own numbers for depletions and flows. Alvarado seconded. Brooks said the Service will use Gen2 until flow recommendations are revised. He also mentioned the CC is under the impression that Gen3 is not ready. A discussion ensued about the 100,000 af difference between versions. Some said the two versions should not be compared. Westfall mentioned that if there is 100,000 af of additional depletions and 60,000 af of extra flows, isn't the difference really only 40,000 af. Whipple asked what the Service considered to be the appropriate baseline. Brooks said that one of the resolutions from the CC meeting was that the Service reaffirms its commitment to using the Program's section 7 principles and will describe how they use the model in section 7 consultations. He pointed out that the model is not the only information the Service uses. Leach pointed out that there is two purposes for the model, to assist with flow recommendation development and to help determine project impacts. Harris emphasized that the HC needs to keep in mind that their role is in model development and that Gen3 is ready. There was disagreement about whether or not Gen3 was ready to be implemented. It was mentioned that the BC also needs to be involved in this discussions.

Brooks explained that because of the obvious disagreement on the issue of implementation and use of Gen3, the CC/Program will:

- Request input from HC and BC on model use by the Program for developing flow recommendations and evaluating projects impacts.
- Use Gen2 until Gen3 is completed and flow recommendations are revised.

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- Direct the HC to continue to update Gen3 independent of the flow recommendation revision and support planned adjustments to the model by Reclamation/HC. HC needs to provide the CC with an estimated timeline for completion.
- Direct the BC to start the flow recommendation review. Review and revision is to be completed during FY09 and will serve as the Integration Report. Schedule for BC is to plan the review/revision in FY08, do the review/revision in FY09; and complete the revision by FY10. The BC is to provide their methodology for conducting the flow recommendation review/revision to the CC for their review.

The discussion about whether or not Gen3 is ready and should be implemented continued. During the discussion, the viability of the model, the need for a model, and the need for the HC was questioned. The primary problem with the model is with how baseline depletions are included. Campbell mentioned the importance of having a long enough planning horizon to allow for recovery of the listed species.

Harris reiterated his motion, as modified; that the model is technically ready to go. He suggested that there is agreement (among the HC) on historic depletions for natural flows but no agreement on baseline depletions. The vote resulted in 1.5 yeas and 7.5 nays. The motion did not carry. Numerous HC members expressed that there are too many unknowns and believe that before it can be determined if Gen3 is ready to go, they need to examine some of the new changes that are to be made including return flow lagging and the hardwiring of San Juan-Chama. It was recognized that the baseline issue can not be resolved by the HC. After the model adjustments are made, they can work toward resolving the baseline issue. To do this, model runs with maximum water rights depletions included and runs with anticipated future depletions are needed to compare results.

Miller made a motion that the States' baseline depletions numbers be accepted and that, as a rule, the States will determine their own baseline depletions providing documentation on methodology and process for making changes. Harris seconded. Discussion resulted in a modification to the motion to add, "*Sovereign Nations and State.*" Further discussion resulted in another modification to the motion adding, "for purposes of input into the model." The vote resulted in 5 yeas and 4 nays. It did not pass.

Page said he will write-up a response for the CC describing the outcome of discussions regarding the HC's process for resolving issues and completing Gen3 and send it to the HC for their review. The intent will be to have it to the CC prior to their January 28 conference call.

King said that if soil moisture is factored in, there's about a 1% increase in water and he recommends that it be turned on in StateMod. The group agreed. King also reported on their migration from Solaris to Windows which is a necessity because they are getting rid of the Unix-based Sunboxes. He said there have been a few problems as some aspects of Gen2 will not run in Windows.

**Long Term Model O&M –Memo describing Reclamation's and the Service's respective roles in future model development and O&M** – Page asked if anyone had questions on the subject memo. Whipple said he has not reviewed it in detail yet and asked if it conflicts with biological opinions such as Navajo-Gallup that assigns certain responsibilities to the HC for modeling depletions. Page said it did not but asked that Whipple, and others, review the memo and get back to him if they have any issues.

**Navajo Reservoir Operations** – Page announced there will be a Navajo Operations Coordination Meeting in Farmington on January 22, 2008 @ 1 p.m.

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**Addressing Global Warming in Navajo-Gallup BO** - Leach reported on climate change issues. He said in the next six months they need to complete a biological opinion on Navajo-Gallup. To do that, Reclamation will be doing an analysis of global climate change. He said the Service was sued for not considering the effects of climate change during a consultation on delta smelt. The 9<sup>th</sup> District Court directed the Service to consider how climate change could impact water supply and reservoir storage for all biological opinions. Campbell said that even though the 9<sup>th</sup> District does not cover this geographic area, the Service made a decision that climate change will be considered nationwide. Alvarado voiced concerns about how this might impact water projects. Campbell agreed.

**Review of New Action Items** - See attached log

**Schedule Hydrology Committee Meetings for 2008**

February 7 –conference call primarily to discuss model runs

April 29, 9 a.m., meeting, Farmington

June 17, 9 a.m., call

Sept 16, 9 a.m., meeting

Dec 2, call

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<b>HYDROLOGY COMMITTEE ACTION ITEM LOG</b> <b>(Updated December 4, 2007)</b>						
<b>Action Item</b>		<b>Meeting/ Origination Date</b>	<b>Responsible Party</b>	<b>Due Date</b>	<b>Revised Date</b>	<b>Date Completed</b>
4	Add model runs and other information to the permanent hydrology website: <a href="http://uc.usbr.gov">http://uc.usbr.gov</a>	7/25/01	Erik Knight	Ongoing		
5	Model modification briefings.	7/25/01	Reclamation	Ongoing		
12	Any new data or methods incorporated into Riverward or State Mod will be shared with the Hydrology Committee.	7/25/01	Reclamation	Ongoing		
34	Gage error analysis discussion: the Hydrology Committee still needs to determine whether big losses are due to daily segregation. The Committee has the option to re-evaluate losses once the 3 <sup>rd</sup> Generation model is complete. HC decided to live with gage error.	11/27/01	Reclamation	Ongoing	Postponed until StateMod analysis is completed	
105	USGS agreed to give a presentation annually to the Hydrology Committee regarding the effectiveness of the gage readings.	8/5/03	USGS	June 13, 2006	Annually	
139	Committee will report any new projects which will be coming up.	5-18-04	Hydrology Committee	Ongoing		
141	Budget Report to include foot notes with explanation of expenditures.	11-9-05	Pat Page, Dave King and (HC comments)	Ongoing		

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144	Reclamation will work with NM and CO on their concerns with G3.	09-12-06	Pat Page/John Whipple & Ray Alvarado	Ongoing		
145	CO to provide John Whipple with the statistical relations for regressions to get the natural flows for the period outside of records for diversion points in Gen3	09-12-06	Ray Alvarado	Pending		
146	John Whipple requested historic and base line depletions	12-5-06	Ray Alvarado	Pending		
149	SJ Chama historic baseline depletion data will be requested from Eric Wilson in Colorado (done 6-13-07). Ray Alvarado will compile finding and forward to HC.	06-12-07	Ray Alvarado	Pending 2 <sup>nd</sup> half		
155	Need to request cost estimates from CADSWES for further work, then forward to HC list serve	9-11-07	Dave King	11-15-07		
156	Provide a memo addressing the issues with the model in which the CC had concerns with, resulting from Tom Pitts memo dated 7-10-07	9-11-07	Reclamation	11-15-07		
157	Provide description of return flow lagging for discussion at the Feb. 7 meeting.	12-4-07	Dave King	2-07-08		

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158	Provide budget status report.	12-4-07	Reclamation	12-14-07		
159	Whipple to provide seven time series: - Estimated historic flows @ 3 diversion points (Blanco, Navajo, and little Navajo) - Operated numbers @ the 3 the diversion points - Azotea Tunnel	12-4-07	John Whipple			
160	Hardwire San Juan-Chama numbers into SJR hydrology model.	12-4-07	Reclamation			
161	Compare Gen2 and Gen3 including natural flows and depletions for discussion at next meeting.	12-4-07	Reclamation	2-07-08		
162	Send draft write-up for CC describing status of the SJR Model issues and HC recommendations to HC for review in time to provide final to the CC prior to their January 28, 2008, conference call	12-4-07	Pat Page			