

Glen Canyon Dam Technical Work Group Meeting Conference Call

July 27, 2010

Conducting: Shane Capron, Chairperson

Convened: 9 a.m. (MDT)

Committee Members/Alternates Present:

Jan Balsom, GCNP (alternate)
Cliff Barrett, UAMPS
Perri Benemelis, ADWR (alternate)
Jerry Lee Cox, Grand Canyon River Guides
William Davis, CREDA
Christopher Harris, Colorado River Board/CA
Rick Johnson, Grand Canyon Trust
Robert King, UDWR
Glen Knowles, USBR

Ted Kowalski, CWCB (alternate)
Emily Omana, GCWC (alternate)
Don Ostler, UCRC (alternate for NM)
Clayton Palmer, WAPA
John Shields, Wyoming State Engineer's Office
Sam Spiller, USFWS (alternate)
Bill Stewart, AGFD
Jason Thiriot, Colo. River Comm./NV (alternate)
Michael Yeatts, the Hopi Tribe

Committee Members Absent:

Charley Bullets, Southern Paiute Consortium
Kerry Christensen, Hualapai Tribe
Kurt Dongoske, Pueblo of Zuni
Paul Harms, NM Interstate Stream Commission
Norm Henderson, NPS/GCNRA
Amy Heuslein, BIA

Tony H. Joe, Jr., Navajo Nation
John Jordan, Federation of Fly Fishers
Larry Stevens, Grand Canyon Wildlands Council

Interested Persons:

Patti Aaron, DOI
Deanna Archuleta, DOI
Mary Barger, WAPA
Lori Caramanian, DOI
George Caan, Colorado River Comm./NV
Marianne Crawford, USBR
Helen Fairley, USGS/GCMRC
Dave Garrett, Science Advisors
Paul Grams, USGS/GCMRC
Martha Hahn, GCNP
John Hamill, USGS/GCMRC
Leslie James, CREDA

Mary Killeen, GCNP
Dennis Kubly, USBR
Steve Martin, GCNP
Tricia McCraw, ADWR
Barbara McKenzie, USGS/GCMRC
Ted Melis, USGS/GCMRC
Gopaul Noojibail, GCNP
McClain Peterson, Colorado River Comm./NV
Larry Riley, AGFD
Pam Sponholtz, USFWS
Larry Voyles, AGFD
Palma Wilson, GCNP

Meeting Recorder: Linda Whetton

Administrative: Shane welcomed the members and said the conference call would focus on three issues: 1) the Socioeconomics AHG Report and a possible motion, 2) the General Core Monitoring Plan AHG Report and a possible motion, and 3) a recommendation of a hydrograph for the AMWG to consider. He reviewed the attachments that were sent out in an e-mail yesterday. Due to the subject matter and the time allotted to discuss the individual topics, he cautioned that some discussions may be limited.

Socioeconomic AHG Report (Attachment A). Shane said the report has been worked on by the TWG over the past four meetings. The group came up with a proposal but not everyone agreed with it. He said Norm Henderson decided at the last minute that he couldn't support it. Even though it's not a perfect document, Shane said it was a good compromise. He reviewed the following changes:

In general, the ad hoc supports a phased approach as described below:

- a) In FY 2011 and 2012 implement the **most expedient** action items including the Base Case, **and** Change Case **for electrical power**, and Recreation Expenditure analyses. These have been identified as the **most expedient** items, can likely be implemented without substantial costs to the program in these years, and represents "low hanging" fruit to get the process moving.

- b) In FY 2011 and 2012, begin the work of educating the program about market and non-market recreation economics, and utilize experts as needed to scope out the appropriate non-market (e.g., willingness to pay) economic work to be done and how specifically to do that in order to implement the workshop recommendations while tailoring those to the needs of the GCDAMP. This would include the “economics 101” course for TWG and AMWG, as well as GCMRC working with other appropriate experts to develop a non-market economics study plan for the program.
- c) In FY 2012, or as soon as the non-market recreation planning is completed and satisfactory to the GCDAMP, begin implementation of the non-market recreational portion of these recommendations.

Shane said the other studies the AHG would like to do were listed at the bottom of the second page. He asked the AHG members if they wanted to make any comments. Helen said she thought the “recreation surveys of Glen Canyon anglers and day-use rafters” was already being covered by what was said earlier in the document. Shane said he kept it in to ensure people understood that it was something they wanted to have implemented. He said that under “c” it may or may not happen within the next budget cycle by FY12 so he wanted it carried over for further consideration. He feels it’s something the TWG will be working on for awhile and doesn’t want it dropped.

There was discussion about the study plan GCMRC was to develop that would incorporate both market and non-market activities over the next two years. Helen said she hadn’t received clear direction on doing anything non-market wise until the market work has been done. Shane clarified there are three things to be done: 1) base case analysis, 2) power market analysis, and the change case power modeling analysis. He also said the recreation expenditures analysis would need to be done. Don said he recalled a commitment that there would be an analysis done of the 1996 ROD power conditions. Shane said that would be done under the change case analysis.

John Hamill asked that if the TWG were to adopt the recommendation as a motion, which basically directs a whole new economics initiative beyond what’s currently outlined in the FY11-12 budget, then are they reprioritizing the FY11-12 budget to accomplish the tasks that are outlined. Shane said it was his understanding the TWG would not. He said that when this was started, Anne Castle asked that the socioeconomics recommendation be on a separate track to be considered in August and that AMWG would consider how to implement those recommendations financially into the program. The TWG’s job was to make recommendations based on what type of activities were thought to be beneficial from the recommendations. He sees them somewhat based on Anne’s request. John said it didn’t make sense to him in that the AMWG wouldn’t have sufficient time to discuss and be able to reprioritize the budget. Clayton said the AHG had long discussions about whether they should engage in a budgetary discussion and from time to time they talked about whether there was money available/not available. He said there was a budget related comment on page two in which it talks about doing the recreation expenditure and it says the project described would replace project 9.04.11-12. He said he understood John’s point and thinks that TWG could discuss further. He said there was agreement that what they were trying to pass on was what they recommended from the report. He said that there are years attached to it and was a compromise because some members of the AHG wanted to make sure the work got done. John said that the TWG’s recommendation was to get the work done in FY10-11 and the motion implies that. As such, he thought there needs to be some recommendations for how they would fund the work. Clayton said the AHG is recommending a power based case and a power change case analysis to be done by Western at no cost to GCMRC except for the development of the task and the peer review work. He said that may have a budgetary impact. He said there is a recreational expenditure analysis in which GCMRC project 9.04.11-12 is dropped and this one put in its place. There is a question as to whether that project has adequate funding to accomplish the task. The economics 101 is proposed but Helen said earlier that she was hopeful there might be some DOE and DOI recreational economists and others that would help put the workshop together at no cost to GCMRC. He said the only real budgetary problem is the development of the non-market recreational study. John said there is also no money in the FY11 or FY12 budget for the market-based studies. Clayton said the power economics market studies the GCMRC budgetary implications are for the development for the task and the peer review process but not for the modeling itself which would be done by Western at no cost to GCMRC. He added that for the recreational analysis the AHG recommended having that analysis done in place of project 9.04.11-12.

Shane said he didn't have the minutes from the last AMWG meeting when the request was made but that the TWG had discussed the issue at the March meeting and these two items were to be on two separate tracks, the budget and the socioeconomics recommendation. It was his understanding from the beginning that the TWG wasn't suppose to consider reprioritizing things or dovetailing it into the budget, that they were asked to do this on a separate approach which was to determine what would be feasible, pros and cons, and what they would recommend implementing and then let AMWG discuss whether they wanted these reprioritized in the budget to do the work. He said that he thought a lot of the work was done at no cost to fit it in but said there are some things that will have associated costs and that the TWG needs to wait and hear from the AMWG to see whether they support this and if the budget needs to reprioritized to fund the items.

Shane asked if the TWG wanted to consider the following motion:

Proposed Motion: The TWG has received the report entitled "Final Report of the GCMRC Socioeconomic Research Review Panel" dated February 26, 2010. The TWG has discussed the workshop recommendations related to electrical power production and recreation surveys. The TWG intends to more fully consider the workshop report and all the recommendations after the August AMWG meeting, but acknowledges the need to make immediate recommendations now for the FY 2011 and 2012 BWPH.

Discussion.

In getting to John's concern, Ted suggested that rather than saying "the ad hoc" or "the TWG" support the phased approach as described below just add the words "as the budget allows" or something to that effect to recognize that this doesn't deal with all the budgetary constraints and that has to be brought out during the budget conversation as well. Perri said she agreed and wondered if for those items that they believe there is sufficient funding in the budget to cover, it may be appropriate to keep the fiscal year information in there but perhaps for those other items, like "b" and "c" there should be some substitute language, pulling out the dates, and just say something more general about moving forward expeditiously while the TWG tries to develop more information about the budget implications of those items. Shane said he appreciated the comments and noted that the AHG worked very hard to craft the motion. He said the reason the years are even in the report is to assure some members that some of these issues won't get dropped off the table for 3, 4, or 5 years. He said the main reason to have it is to describe the process for how the TWG would recommend that things get implemented over time. In hoping to hold the coalition together, Shane said that perhaps they add a sentence to deal with the budget issue in the first paragraph instead. He offered something like "The TWG acknowledges that we have not considered fully the budgetary implications of implementing of this plan." Ted and Cliff said the language sounded reasonable to them. John said that Helen pointed out to him that what is proposed under item "a" is different than what's in the current work plan for the power economics portion. He said what they had planned for FY11 was an evaluation of the model of GTMax. He said there was a workshop planned in FY11 but the actual modeling would not be done until FY12. He said the motion seems to add everything up to the FY11 timeframe and he felt GCMRC would need to restructure the current work plan to accommodate it and there might be additional resources to accomplish that as well. Clayton said by adding the sentence Shane suggested about the budgetary implications would satisfy John's concerns. Shane said that in the paragraph under the FY2012 biennial work plan and hydrograph section, the following sentence could be added, "TWG acknowledges that we have not fully considered the budgetary implications of implementing this plan." Glen expressed concern that the TWG was "punting" a decision to the TWG and felt it was the TWG's responsibility is to make changes but also provide information about how that affects the budget. Shane said he made that case to the AMWG at the February meeting. His recollection was they were not allowed to dovetail this into the budget and that they were to be done on separate tracks and leave that discussion about implementation to a later date or to the AMWG.

The following comments were extracted from AMWG Feb. 3-4, 2010, Meeting: Ms. Castle said the AMWG would need to see a more complete description of what the socioeconomic Phase I would look like and what would be proposed for funding and any potential tradeoffs that might be done with the same money. She didn't feel the program was ready for a policy decision on a particular budget line item for this coming year and that more refinement was needed in terms of the report from the workshop, evaluation by the TWG for a particular program going forward, and then further discussion by the AMWG. Ms. Castle said she would talk to Shane offline about direction for the TWG after the report was completed.

Shane said at this point in time the AMWG is expecting a motion with a recommendation on how to implement the work. He said that if they wanted to make budget changes, then the call would need to be terminated so they work on it more and then come back for final resolution. Ted said that in addressing his and Perri's concerns, saying that "recognizing that this doesn't account for budgetary constraints or that additional budgetary movement would have to occur to effectuate all these," he was sensitive that Shane had a definitive coalition coming forward with the proposal. He said that if the TWG is having to make a recommendation to the AMWG, then it's a reality that they have to recognize that there are only a couple of things that can be done with the current budget that they're recommending and the remainder of items to be done as the budget allows in the future. Shane said there wasn't time to tinker with the budget and another meeting would need to be scheduled. Shane re-read the sentence he added, however, Ted felt it should be revised to read "accomplish the things below as the budget allows for" and then specifically with regard to "b" and "c," take out the dates and just say as "expeditiously as possible" or something to that effect. Perri said she was also concerned because John brought up "a" and that there are some fatal flaws on what's being proposed. Cliff said that before the TWG attempts to make budgetary changes, the AMWG should be asked if they want any of the work done and then proceed with making budget recommendations. Glen suggested going through the AMWG minutes and figure out what the direction was from Ms. Castle and adding a little more to his sentence indicating that if they want to do the work in FY11, it would take some budget recommendations from the AMWG. He said additional language could be included per Ms. Castle's instruction.

Shane read the revised addition to the motion: The TWG acknowledges that we have not fully considered the budgetary implications of implementing this plan. If AMWG approves implementing this plan, additional funds would be needed in FY11-12. This may require reprioritization of current funds.

John reminded the group there is already \$2 million in deferred projects and this work would also go into that list. Glen said part of Anne Castle's charge to the TWG at the AMWG meeting was to discuss funding, tradeoffs in terms of funding, and advise the TWG to look at the report in light of the budget discussion in April. He didn't want to derail the work the ad hoc group had done and said the sentence Shane provided addresses that but emphasized the AMWG expects the TWG to consider this in light of the budget. He said the recommendation was pretty well crafted for what could be done in FY11 and they're not far away from implementing the work in FY11. When the budget is reviewed at the end of FY11 for FY12, Shane said the TWG might need to tweak the budget in FY12 to do the remaining work. He said it would be important to get the policy buy-in from the AMWG before going too much further.

Motion (Proposed by Cliff Barrett, seconded by Perri Benemelis): The TWG has received the report entitled "Final Report of the GCMRC Socioeconomic Research Review Panel" dated February 26, 2010. The TWG has discussed the workshop recommendations related to electrical power production and recreation surveys. The TWG intends to more fully consider the workshop report and all the recommendations after the August AMWG meeting, but acknowledges the need to make immediate recommendations now for the FY 2011 and 2012 BWPH. *The TWG acknowledges that we have not fully considered the budgetary implications of implementing this plan. If AMWG approves implementing this plan, additional funds would be needed in 2011 and 2012, this may require re-prioritization of current funds.*

In general, the TWG supports a phased approach as described below:

- d) In FY 2011 and 2012 implement the most expedient action items including the Base Case, and Change Case for electrical power, and Recreation Expenditure analyses. These have been identified as the most expedient items, can likely be implemented without substantial costs to the program in these years, and represents "low hanging" fruit to get the process moving.
- e) In FY 2011 and 2012, begin the work of educating the program about market and non-market recreation economics, and utilize experts as needed to scope out the appropriate non-market (e.g., willingness to pay) economic work to be done and how specifically to do that in order to implement the workshop recommendations while tailoring those to the needs of the GCDAMP. This would include the "economics 101" course for TWG and AMWG, as well as GCMRC working with other appropriate experts to develop a non-market economics study plan for the program.
- f) In FY 2012, or as soon as the non-market recreation planning is completed and satisfactory to the GCDAMP, begin implementation of the non-market recreational portion of these recommendations.

The TWG has developed the following recommendations. Additional expertise (and funding) may be needed at GCRMC to implement the following tasks:

Base Case analysis: Implement the report recommendation to complete base and change case studies for hydroelectric operations in FY 2010. The detailed description of the base case study will be prepared by GCMRC, with input from WAPA and appropriate experts, based on the description in the Socioeconomic Panel's report and any additional specifications by the TWG/AMWG. This base case study will include an analysis of "spill over" with the WECC. The base case and spill over analysis will be completed by WAPA and a report prepared at no cost to the AMP. The report will be submitted by WAPA to GCMRC for peer review. GCMRC will oversee the peer review process and use the Science Advisors (i.e., Dave Garrett or other expert) as needed. WAPA will incorporate changes into the report based on comments received from the peer review process.

Include the funding and the need as a line item in the 2011/12 budget, workplan and hydrograph.

Change Case analysis (power modeling): will be done by WAPA based on tasks provided by GCMRC, developed by GCMRC with input from WAPA and appropriate experts, based on the description in the Socioeconomic Panel's report and any additional specifications by the TWG/AMWG.

Recreation Expenditure analysis (market): We recommend that an analysis of data related to the regional economic effects of GCD experiments and other DOI actions be undertaken. This analysis would be devoted to the impact on the regional economy as a result of changes in expenditures resulting from these actions.

The groups of interest for this study would be Glen Canyon day use rafters and anglers and Grand Canyon Whitewater rafting of commercial and private boaters from Lees Ferry to Diamond Creek or Lake Mead and the Hualapai white water recreational enterprise that services Diamond Creek to Lake Mead.

This expenditure data can be used in the IMPLAN regional input-output model to estimate the positive economic impacts to the surrounding counties and Indian Reservations in terms of direct and indirect personal income and employment generated. Indirect effects would capture the multiplier effects from subsequent rounds of spending in the surrounding region. Separate interviews with the guides and the tribes will be needed to obtain their expenditures associated with the guiding, access fees, food, and other costs. We recommend that the economic impact analysis use two impact areas. For consistency with past research, it would be appropriate to use the counties surrounding the Grand Canyon. However, since many outfitters have their base of operation in Nevada or Salt Lake City, it would be appropriate to show results using a broader multi-state economic impact area (Report page 16). This project would replace GCMRC Project 9.04.11-12.

Provide training to AMP stakeholders on use and non-use values: (implement in FY 2011 or 2012), economics 101 as described in the report. To be organized and hosted by GCRMC with financial support from WAPA.

Other studies including non-market recreation studies which will be considered further during

the ad hocs review of the report and implemented under the time frame described above:

- a) Implement non-market recreation surveys of Glen Canyon anglers and day-use rafters
- b) Identify tribes and consider specific surveys of preferences and attitudes
- c) Conduct power flow studies that show the financial and economic consequences of Glen Canyon management alternatives on WAPA, WAPA customers, and the Upper Basin Fund
- d) Conduct focus groups and piloting of non-use value survey (initiate OMB clearance)

Stakeholder	Vote	Stakeholder	Vote
Arizona Game and Fish Dept. (Stewart)	A	Grand Canyon Wildlands Council (Omana)	N
Bureau of Indian Affairs	absent	Federation of Fly Fishers (Jordan)	absent
Bureau of Reclamation (Knowles)	N	Grand Canyon River Guides (Cox)	Y
Hopi Tribe (Yeatts)	N	Arizona (Benemelis)	N
Hualapai Tribe	absent	California (Harris)	N
National Park Service – GRCA	absent	Colorado (Kowalski)	N
National Park Service – GLNRA	absent	Nevada (Thiriot)	Y
Navajo Nation	absent	New Mexico (Ostler)	Y
Pueblo of Zuni	absent	Utah (King)	Y
Southern Paiute Consortium	absent	Wyoming (Shields)	Y
Fish and Wildlife Service (Spiller)	A	CREDA (James)	Y
WAPA (Palmer)	Y	UAMPS (Barrett)	Y
Grand Canyon Trust (Johnson)	N		

Voting Results: Yes = 8 No = 7 Abstaining = 2

Motion Passes

Abstentions count toward the quorum, but not the vote. For example, if 20 TWG members are present then a quorum is present (quorum=16). If the vote is 3-0-17 (that is 3 yes, 0 nays, and 17 abstentions), the motion passes because abstentions are non-votes for all purposes other than to establish a quorum. To explain further, the simple majority or two-thirds majority is based on all votes minus the abstentions.

Shane asked those who voted “no” on the motion whether it was because of technical, financial, or other reasons.

Glen Knowles: I didn't think the AMWG really asked us to weigh in on the FY11 budget. I'm just concerned that it will create a much more difficult budget discussion and impair our ability to actually get to a budget motion that we can pass at AMWG.

Rick Johnson: I actually support doing the work, but I don't support having WAPA writing help.

Ted Kowalski: I would support it if the dates were taken out explicitly.

Mike Yeatts: I have the same feeling. In FY11 we've already seen so many budget changes that I'd need to know what's being traded off to do the work. I support the studies and there are a couple of economic studies in there so I'm not even sure how the ones in there are going to relate or change based on these recommendations. There are a number of issues that need to be better clarified.

Perri Benemelis: I agree with those comments and with Ted's comment.

Emily Omana: That was my feeling also. The studies are great, but I just don't want it to become a deferred project.

Shane advised the TWG members to inform their AMWG members in preparation for further discussion at the August meeting. He thanked the ad hoc group for all their hard work and the time devoted to working on this report.

Dr. Garrett said the Science Advisors feel that a program of this size without a socioeconomics program is failing. He said the SAs also expressed appreciation for Shane's efforts with the ad hoc group to shepherd this recommendation into a vote and try to move it forward.

General Core Monitoring Plan (Attachment B). Shane said the charge was to review the Core Monitoring Plan and bring back a recommendation for TWG to consider. He said the ad hoc group reviewed the revised GCMP provided by GCMRC. He said the second paragraph states the ad hoc group felt that GCMRC was very responsive to including recommended changes in chapters 1-3, Appendix A, specifically to new concepts like criteria in developing programs prior to setting, confidence and adequacy to answer critical questions, tradeoff analyses, risk assessment, and those types of things

that were included in chapter 3. He said the ad hoc group felt that although they made some good direction on those things, there were some major policy differences of opinion between GCMRC, some TWG members and some ad hoc group members. Shane said the ad hoc group felt there were issues that needed to be raised to the AMWG policy level. He read a potential motion for the TWG's consideration:

Potential Motion. TWG recommends that AMWG consider the following changes to be requested in the draft General Core Monitoring Plan:

1. Remove Chapter 4 which includes descriptions of the individual plans to be funded based on full implementation of the CMINs without priority setting. These individual plans will be developed in coordination with TWG. Also delete sections 3.3.1 and 3.3.4 which identify staffing needs and costs based on the plans in Chapter 4.
2. Comments were provided by TWG of past discussions which envisioned a core monitoring program in the realm of 40-60% of the science budget; these recommendations were declined by GCMRC. TWG would like to develop a core monitoring program that uses trade-off analyses and risk assessment to develop a less-costly program than GCMRC has developed. This approach should be described in Chapter 1 (history) and implemented in Chapter 3 (planning). The general concept is to prioritize projects and implement a program that doesn't include all the "ornaments" on the tree that is generally described by responding to all of the CMINs. Some of the work may be titled "core monitoring" and receive priority funding while other work may need to be funded as monitoring work which would be subject to biennial review based on availability of funds.
3. GCMRC should work with TWG to more fully develop the management process described in Chapter 3, and as was described in the revision, to embrace a collaborative process to develop the core monitoring plans without bias in the outcomes of what will be funded and to what extent they will be funded. In other words, despite the fact that GCMRC and the GCDAMP have worked to develop broad programs, TWG believes that we now need to go back and re-evaluate needs, criteria, precision, frequency, and priorities for a core monitoring program.

Helen said the original charge for the ad hoc group was to develop an appendix for the TWG to review which described a process for making recommendations to AMWG on the individual core monitoring plans that GCMRC developed. She didn't think the ad hoc group had done that. Shane said they did more of the second part which was to review the revised draft plan from GCMRC and develop recommendations. He said the ad hoc group felt that a lot of the things were responsive, but they were at a loggerhead over some of the policy issues and before they could really move forward, they needed to elevate those to the AMWG. Helen said it sounded like he wanted to revise chapter 3 and incorporate it. It was her understanding that the ad hoc group was going to develop their own process for how they were going to take information and then make an actual decision about the plans. Shane said they didn't get to that. Shane asked the other ad hoc members (Mary Barger, Norm Henderson, Glen Knowles, and Clayton Palmer) if they wanted to make any comments.

Glen agreed with how Shane described ad hoc group's work. He said the group understood that part of their charge was to develop an appendix that would describe the process for how the TWG would act on individual core monitoring plans. In doing that they had to look at the entire plan and found that a lot of the existing program was already core monitoring. They felt it would be better to delete those sections which implied that some of the decisions had already been made. He thought it would be better to modify this to purely provide a process to do that instead of indicating that a lot of the work had already been done.

John said the purpose of the core monitoring plan was to lay out programmatically where they were relative to monitoring for the program. It was to assist in long-term budget planning for the AMP recognizing that core monitoring is a major component of this program and it tends to consume a lot of the program's budget. Laying out programmatically what the likely cost is based on what is currently known and what they're currently doing would be useful so that the program could consider what the total

costs of implementing this program would be for doing things like socioeconomic work, decision support, high flow experimentation protocols, and management actions. To him laying out what the cost of monitoring would likely be based on 10 years of development work that has gone on and seemed like a very reasonable thing to support. He said it befuddled him that the ad hoc group would want to cut out the substantive parts of the core monitoring program. The core monitoring designation doesn't occur until step 4 of the process. He said all this lays out is the information needs, the R&D that was funded, a general description of the programs as they are currently being implemented, and the likely cost for continuing to go down that road recognizing that step 4 of the process allows the TWG to refine those individual core monitoring plans to meet expectations and budget constraints. He said this was their current estimate and is a starting point. The idea was that the GCMP would be updated on a periodic basis, perhaps every 5 years, based on new information and as new needs like BFCs come forward. It's not locked in concrete; it's a dynamic plan that will adapt as the needs of this program adapt. He said it's remarkable to him that they've been working on monitoring for almost 15 years and yet they don't have a guiding plan for what they are doing. He feels it is a major step back if the descriptions of the plans as they currently exist are going to be cut out of what the long-term budget implications are. He said that's going in the wrong direction and defeats the entire purpose of having the plan. He strongly disagreed with the direction that was laid out.

Shane said that's exactly why they're at the point they are because they have a philosophical difference of opinion. He said there's no sense in arguing it because they won't be able to convince each other that either person is right. He said they really need to focus on getting to the decision-making process to accept the individual plans. He said he looks at it from the opposite perspective which is taking a step forward and not predetermining what the conclusions will be when walking through each of the processes but really focusing on a decision-making process so there can be core monitoring and that it allows the program the policy leeway of deciding how much the program wants to spend on core monitoring. He thinks the program is at the edge of accepting the core monitoring programs and what goes along which is that full consideration is given to things to be done and making sure that X amount of money is spent on programs and either full or partial implementation of the CMINs based on priorities determined by the program. He asked the TWG for their comments.

Shane said it's about 10:26 and the hydrograph discussion was scheduled for 10:30. He asked the TWG if they wanted to entertain the motion or have further discussion at the next TWG meeting. He said that currently this issue isn't on the AMWG agenda and he didn't know if there would be an opportunity to get on the agenda even if the TWG did make a recommendation.

- *There needs to be a way to recognize that you are spending a lot of money on a monitoring program right now. And maybe this plan should be restated to be a strategy to revise the monitoring plan to a core monitoring plan but somehow you have to start with what you've got. (Garrett)*
- *Paragraph #3 on page 2 is in the form of a motion or at least could be fashioned as a motion that Dave Garrett has described and admonishes GCMRC to work with the TWG to more fully develop the management process described in chapter 3 and continue to work on the monitoring program.(Palmer)*
- *The thing I was unwilling to do was arbitrarily reduce the scope of these programs without a thoughtful process to arrive at what a reasonable reduction would be. I think that needs to be done deliberatively. I think it needs to be done in the context of step 4 on each of these. Step 4 is where the TWG can weigh in and reduce the scope or the scale of any programs. (Hamill)*

Shane said he wanted to hear from more TWG members on the issue.

- *The details of this draft report by the ad hoc group are potentially disputable and John has some good ideas, but I do believe the policy issues that are inherent and the conversation between the TWG ad hoc group and GCMRC are policy issues that need to be taken to the AMWG. (Palmer)*
- *With that in mind, Shane, I know that you probably know how much time is or is not available but the AMWG meeting indicated there isn't much or any, but if you could get 15 minutes for you and John to be able to brief AMWG and have 5 minutes of discussion for some guidance that might help us as we proceed into working further on this in the next four months. (Spiller)*

- *I think it's probably good that it's not on the AMWG agenda because I would like to see this actually become something that we could address at the next actual TWG meeting rather than over the phone. I would certainly like to give it a little more thought before trying to vote on a motion, especially since it isn't an agenda item on the AMWG meeting at this point. (Yeatts)*

Shane said further discussion/action could be moved to the next TWG meeting. Now that the ad hoc group has made the policy statement to the TWG, they can move to considering more of the stuff for a process and more of that first sentence in the charge of how TWG would help implement and make recommendations to AMWG on individual core monitoring plans. The ad hoc group could work more on that and have a full discussion at the next TWG meeting. There could also be more discussion with GCMRC staff and others about this and work out some of the issues. He said that at some point some of the issues will need to be elevated to the AMWG to get some policy direction on them, whether chapter 4 is left in or not. He asked if anyone was opposed to the process of having the ad hoc continue working on the TWG process of approving the core monitoring plans as stated in the first sentence of the charge and perhaps having more interaction between the ad hoc group and GCMRC and then having a full discussion at the next TWG meeting.

Perri said she felt that was a very reasonable approach. Shane asked if anyone was opposed to that. Dave said the science advisors would support the approach and added that he feels there is some friction between GCMRC and the TWG and that also needs to be worked out. He said the science advisors have certainly asked the managers to become strongly engaged and look at many approaches. He said the science advisors would like to be involved with GCMRC and the TWG on working on these issues. John said he would support having Dave involved in the ad hoc group as an advisor. Hearing those comments, Shane said the ad hoc group would continue to work on the report, work out some of the policy issues, work out the TWG role in the process, and come back to the TWG when things are more ironed out.

Helen said she wanted to make a plea that people actually take the time to review the revised plan because it's not always clear to her that everyone has done their homework and it would really facilitate a future discussion.

John said they received 250 comments and he would send out the comments to response table to the TWG.

Shane said that inherent in the process is a couple of policy issues and if they can find a way to implement those and come to an agreement. He said they may not be too far apart in agreeing on the policy issues if they can just figure out how to implement them and agree on the document.

FY 2011 Proposed Hydrographs. Shane said there is a proposal from the DOI-DOE dated July 23, a document from Grand Canyon Trust for provisional recommendations for WY2011 hydrograph, and a figure showing the comparison of WY09 and the TWG proposal. He said that since Rick provided his recommendations awhile back and made notice of those in the last TWG meeting, he wanted Rick discuss his motion first and then move to the DOI-DOE proposal, and then ask for any other proposals.

GCT Proposed Motion (**Attachment C** = *Provisional Recommendation and E-mail Message dated July 30, 2010*). Rick said the first part is a rationale in an attempt to address the requirements of the GCPA to protect Park resources. When he first did this, he was looking at two possibilities for annual volumes of 8.23 maf and a much higher year. He directed people to read the two bottom paragraphs for an 11.5 maf that is currently being projected. The GCT would recommend year-round steady flows because they are the only ones that would result in a positive mass balance of sediment in the Marble Canyon Eastern Grand Canyon based on the modeling work that was recently done by Scott Wright. He said if the forecast changes and there is an April adjustment, then the water would be prorated in order to maintain a stable pattern as much as possible. In addition to that, there would be high flow experiments that would be run if there is a sediment input and defer the criteria for triggering an HFE, either it would come from

the Protocol EA decision or if that's not available, recommendations by GCMRC. He said it seems like recent evidence is suggesting that trout may do very well under steady flows and if that's the case, then a control of non-native predators would go along with that but that would have to be deferred to GCMRC for their best judgment. He said the rationale for doing this is to align with Park values. From what he can tell, year-round steady flows and the pattern of monthly volumes would result in a positive mass balance. All the others would be negative. He said it would also align with the recommendation from the LTEP workshop on flows that are most likely to benefit HBC. Following additional discussion, Rick said he would make a motion using parts of the provisional hydrograph.

DOI-DOE Operating Hydrograph Recommendation for Glen Canyon Dam. (Attachment D) Ms. Archuleta said she wanted to provide some clear background instructions for everyone to understand how DOI and DOE established a hydrograph recommendation. She provided the following information:

The annual release volume established pursuant to the 2007 Interim Guideline. The annual hydrograph for 2011 provides a projection of operation given all applicable consideration and the variability in hydrograph, etc. Previously approved 2011 water year implementation of ongoing fall steady flow experiments unchanged supplies to October 2010 and September 2011. Operations within the remaining 10-month period in 2011 water year. That would be November 2010 through August 2011 to be implemented consistent with the MLFF alternative selected within the 1996 GCD Record of Decision. Ongoing efforts to develop a high flow protocol as previously discussed with the AMWG, any modifications to the 2011 hydrograph for high flow tests will be based on completed high flow protocol which is in progress. They will continue to work within the Glen Canyon Dam AMP to identify actions and ongoing operations to mitigate adverse impacts to downstream resources in Grand Canyon National Park and Glen Canyon National Recreation Area during 2011 within Reclamation's existing operation and environmental compliance framework. Allowing TWG members the opportunity to review and provide input to their AMWG representatives which allows AMWG members the opportunity to again review and potentially provide recommendations to DOI at the upcoming August 2010 meeting in Phoenix. She said the approach to the 2011 operation - its basic premise is scheduling releases to be within the concepts of the operating hydrograph recommendation. The monthly release volumes are to vary within the range of +/- 100 kaf, an average monthly release volume. To begin the initial projection annual release is based on the August 24-month study and will be reviewed and modified based on each 24-month study. October and September is steady flows and are pre-set based on the annual projected release. To determine the monthly release volume one calculates the average monthly release by taking the projected annual release minimum, the October steady flow release minus the volumes released in all other previous months divided by the number of remaining months. The range of potential releases is determined by subtracting for the lower bound of range and adding for the upper bound of range, 100 kaf from or to the remaining average month's release. For each month within the water year of 2011, a release value within the range of potential release is selected. In WY 2011 they're shifting to a lower annual release which has significant probability. The annual operating approach is conservative leading Reclamation to select values at the bottom of the anticipated operational range. This approach reduces risk over releasing water early in the water year which, if the year turned dry, would result in an excessively low release for the remaining year and therefore disproportionately disadvantaging some DOI interests. She asked Malcolm Wilson (Chief, Water Resources Group in the UC Region) to provide additional information and/or answer questions.

Q: *What if the forecast is adjusted up during the course of the year? What if we have equalization releases that are implemented based on an evaluation in April of the year? (Benemelis)*

A: *The concept here is to stay within the concepts of this operating hydrograph recommendation. In either case, what we were walking through was essentially the 2011 current forecast with a projected release of 11.5 maf. Whether things become drier later in the year or wetter, we would start the year basically very conservatively and walk through this process as again you have the annual forecast based on what we do today, the guideline, the 24-month study for August. As Deanna explained, the range is established by taking out October and September releases. They are set already so you take the volume you're going to release to take out October and September releases and then to establish that range, you say okay we've got this much left to release for the remainder of the year, divide it by the number of remaining months. In November you would have 11.5 maf less what is released or*

in September divided by 10 remaining months and that would be your average and then you do the +/- 100,000 acre floods to establish the range. Getting back to your point Perri, we would certainly be conservative in response to operating under these recommendations and under our current operation as well. We would be conservative probably through January or February because we don't know prior to that really what we might get for runoff snowpack. The first few months would not change much in either an 11.5 maf which they are expecting today or 11.5 maf and dry to trigger down to 3 in April, 4 and 11 flag going higher. You would see much change in the hydrograph or the graph in front of you. Certainly if in January, February, and into March for sure if we had projections of a higher year that were to occur, we would operate under the same calculations that Deanna laid out in the paper establishing that range of the +/- 100,000 and working within that. I would suggest that if it became a wetter year, we would have to look towards the latter part of April, May, Jun, July, and August and raise releases to make sure we could move the flow amounts way up to 13 and stay within that range. Note that because of the calculation what you have released in previous months affects the average you have to release for the remaining month. As you step through each month where you're going from 11 to something higher, your range actually rises as well similar to what you see depicted on the graph before you. It would rise in a year that goes 11.5 or 13 more dramatically. (Wilson)

Q: *How do the proposed operating parameters change what you would've done anyways? (Johnson)*

A: *I can give you some rough numbers of what we might've done or might do under current guidance, but recognize that anything we talk about here and the direction is certainly going to change based on hydrology forecasts and resulting projections for the year. If you started off the year on your best, look at the red bars here, 492 kaf would be roughly where we start and that's where the red bar is. We would probably hold back a bit more than the recommendations and the calculation of this range so in November we would probably be more on the order of 800. Then moving into December-January traditionally we do respond to power demand in the releases probably on the order of 950 for December and January. Again, going Feb-Mar-Apr they have lower power demands so Feb-Mar would be stepped back. (Wilson)*

Q: *Can you provide a most probable release pattern for 2011 under ROD constraints and these proposed parameters? What would you project to do at the beginning of the year understanding things could change but give us the most probable for an 11.5 maf release year? (Johnson)*

A: *If you do look at the band, I would suggest that it would rise in April and then may be closer to the upper end of that gray band, Jun-Jul, on the order of maybe 12 or 7 and drop off. To give you a rough feel for how it might look and again it would be sort of a double hump in the year which is consistent with how we've operated in the past. (Wilson)*

Q: *So can you get me those specific numbers then? (Johnson)*

A: *I think we might be able to do that. Again, anything provided is a very rough projection. (Wilson)*

C: *The point of having that, of course, is to make any supportable claims about the expected resource result depends on what you would've done without implementing _____. (Johnson)*

R: *Just looking conceptually, again, if you look at the band there, you have a fairly even band rising and what you would see in an operation under current guidance would be a rise to the bottom of that band, Dec-Jan, and dropping below that band Feb-Mar and then rising well into the band Apr-May-Jun-Jul and then dropping back down in August. (Wilson)*

Q: *This question is probably for Rick or for Deanna. Within the AMWG program the stakeholders are there to represent particular interests and to recommend operations that balance the resources. When I look through DOI's and GCT's recommendation, I don't see that balance of resources. Instead I see sediment being proposed as the foremost resource and all other considerations seem to be secondary and are not mentioned at all in either of these proposals. Perhaps that's not called out but I'd like to hear about your perspectives with regard to looking at balancing these resources. (Benemelis)*

R: *Sediment is kind of lead here as is HBC because those are two of the major ones because we have very good information showing that sediment is negatively impacted by MLFF, particularly at the high annual following releases. I did not put in a hydropower specifically because I put a lot of value in what the GCPA tells us which is to protect Park resources. If you read the legislative history and a lot of other documents that surround that, including the early ROD, it's to do that and have the minimum impact possible on hydropower and other values. So the way I look at it is right now it's not a balance, not that hydropower is equal for sediment. Congress told us pretty specifically that we are supposed to protect Park values and we're not doing that right now. So what I'm doing is proposing a hydrograph that will protect Park values and if there is a way to protect Park values that has a lower impact to hydropower value, then I think that's what should be out on the table, but always from my perspective is protecting Park resources and values. You made a comment at the beginning that we're all there to represent a particular interest and I would disagree with that. I think we're all there to advise the Secretary on how best to implement the GCPA regardless of what our area of expertise or our particular interests are. I don't think we should be there with different opinions or different agendas. We should have the same agenda which is to advise the Secretary on how best to implement the Act. (Johnson)*

Q: Perri, there are couple of things I would ask you to look at when you get a chance. I think the introduction of the federal family position really gives you a good evaluation of how we worked on this. I want you to keep in mind that this proposal fits within the MLFF and the 1996 ROD. And Jan you might want to engage in some of the discussion about what things were put on the table and considered. (Archuleta)

A: We look at the sediment resources and gain a substrate for everything else but it's what we can do in terms of meeting the intent of the GCPA, recognizing the resources of values and also the processes that are so inherent to that system. We tried to explain it as looking at it conceptually as how can we look at the hydrograph and flows from the dam to meet multiple objectives but first and foremost is the GCPA. We tried to include in here a short paper that looks at what the fundamental challenge is in looking at flows that would benefit the system as a whole to ecological processes and functions for native flora and fauna, archaeological and cultural resources, recreation, and other values and some of those values are a little tangential but it is that naturalness of the system. As we look at what we could do with a hydrograph, we tried to incorporate all of those. The thing that is most easily measured and most readily apparent is the sediment transport because it forms the substrate for almost everything else. I don't know if that helps but that's how we were trying to address it. (Balsom)

R: I understand the perspective and I do have a different take on the GCPA in that it is subject to a lot of other laws and portions of the Law of the River and adds additional criteria but doesn't necessarily give primacy to those. (Benemelis)

C: Perri, I just want to reassure you that we don't have a separate read on that. This is not an attempt to change the 2007 ROD or the interim guidelines. We have no interest in doing that and there is absolutely no plan to do so. Again, this fits within the MLFF and the 1996 ROD. I hope that gives folks a little more comfort and understanding of how we looked at this and evaluated all the considerations. (Archuleta)

C: I don't see how that jives with bullet #4 under proposed operating procedures for 8.23-9 maf. Anything greater than 16,000 yes, that's less than the limits in the ROD but that's a new restriction in the ROD. I'm curious as to how you justify that. (King)

R: We actually worked quite a bit with Reclamation in terms of if we had an 8.23 maf year and what it would be and how would the flows normally peak out. This is pretty much within what it would've been without our operating parameters but the concept in all of this is to try and retain as much sediment as we can within the system for all of the various resources that are dependent upon it within the constraints of the ROD flows. (Balsom)

C: I agree what's in the ROD flows but putting it on paper and constraining so that it can only go at 16,000 is a modification of the 1996 ROD. (King)

R: I appreciate that. This is a recommendation we're putting forward and is based on the modeling that came from Reclamation. This is probably what they would've done anyway. Maybe having it written down changes something. I don't know if that does from where I'm sitting with a Park Service hat on and a DOI hat and I'd actually bounce that back to Deanna and Lori. (Balsom)

R: If that's the case, what do you need that bullet in there at all? Just let them operate under MLFF. (King)

Q: I would agree with Robert. If this is no significant change from the status quo, what's the point? Is it just window dressing? (Johnson)

A: We do not view this as a modification of the ROD or the Interim Guidelines or any of the other laws and authorities applicable to operation of the river or GCD. I don't think this proposal is just window dressing. Jan can weigh in on that some more. We view this as being MLFF. We laid it out in what was circulated and I think that speaks for itself. (Caramanian)

R: I would argue that what I put forward isn't a violation of any of the law and policies that surrounds operation of the dam either. There's a suggestion that it is and if that's the case, I would like to see people make that point. MLFF provides outer criteria or outer limits of operation. The Secretary has a whole lot of flexibility to operate anywhere within those criteria so I don't see a 16,000 cap as being a violation of the ROD. The whole point to me is that if you're going to put out these parameters and assert they further protect resources, I'd like to see where that's actually happening. I don't see how you do that if you don't have a pattern of monthly volumes that you would've operated under anyway. How can you make the statements that you've made in the document about the expected resource results when there is no comparison made? (Johnson)

A: I think what you're saying is taking it to heart. We tried to look at it conceptually and based on the 20+ years of information on all of these flows, we're trying to do something that will help improve conditions. We were looking at a conceptual program to help get us to an improving condition, not a degrading position. (Balsom)

Q: Are you arguing that the pattern of monthly volumes is going to result in a positive mass balance of sediment? (Johnson)

A: I'm not sure I can go that far. I'm going to ask my other DOI colleagues to weigh in on this as well. What we were looking at was really trying not to have any greater losses. We know we're going to be in a year that's probably going to be more than 8.23 so how can we kind of minimize some of those losses to look at what we can do to improve conditions. (Balsom)

R: I think the modeling work by Scott Wright showed you how you could do that. I'm not taking it out on you Jan, but this is really frustrating to me that DOI would forward a proposal that is likely to result in a loss of sediment in the system. I just can't understand how you can say that in good faith and say that you're following the intent of the GCPA. (Johnson)

C: Under the DOI-DOE hydrograph proposal on table 8 are three hydrological scenarios. They are for the minimum probable, most probable, and maximum probable. To take the example of the most probable which releases over the course of the year 11.5 maf -- In the historical past, if there was that amount of volume to be released in the course of the year, then volumes in Jun-Jul-Aug-Sep be bumped up since those are considered power months. April and March would be lower volumes than what is shown here. Instead the Bureau has not just in its proposal for 2011 but in several previous years spread the summer volume out over a larger set of months than they have done for sediment conservation previously. In the past we would've expected to see April at 900,000; May at 900,000; and June, July, August, and September at 1.2 or 1.3 MAF. Not just this proposal for 2011 but in the past 3 or 4 years the Bureau of Reclamation has spread the summer volume out over a larger period of months. (Palmer)

Q: My comments and questions are necessarily constrained by the ongoing litigation so I'm going to limit some comments to some technical questions. Since Clayton was just speaking, the DOE-DOI proposal does not include any analysis of power impacts so I would ask that energy and capacity impacts be provided for each of the three scenarios. Basically the science basis under expected resource results, I would like to see a little more robust description of the expected outcomes, hypotheses, and what do you anticipate are the resource benefits so that there can be some discussion by the AMWG of tradeoffs? (James)

R: We have a chub population that has shown some improvement recently and we're talking about modifying operations that's very different at this point then I think that warrants a lot more thoughtful discussion. (Benemelis)

R: I'm not sure which one of us is going to address it but I think we tried to identify in the paper what we were trying to do. We certainly considered all of the resources that we're managing for from the Park's perspective, from the fish perspective. I know that Western has been involved as well as Reclamation so we tried to look at all of these in terms of what we could do to really meet some of the criteria that we have to meet. We certainly didn't include the discussion of HBC. It was first and foremost because there are endangered species responsibilities. Maybe somebody else will want to weigh in on that. (Balsom)

R: That's right Perri. HBC was a major component, also other aquatic resources pursuant to the GCPA's identification of biological and cultural resources but the chub was a major, major concern and we feel this recommendation is appropriate. (Benemelis)

Q: I would ask then, Sam, when you were developing this, were you looking comparatively at a change of sorts given the improvement in the population? I think it's somewhat speculative. We don't really know what the impacts of this may be until we get into implementation. I would again say that we've seen some improvement in that population under our current operation. I would like to hear a little bit more about how comparatively we ... and what the justification is for a departure from that at this time. (Benemelis)

A: I would like to concur with Leslie and Perri that the expected resource results are not supportable. Part of the reason it's not supportable because you don't have an equal action alternative to compare it to so you're making these assertions and there is no basis for doing it as far as I can tell. Although you may feel that given your best guess, that may be the case, you haven't really provided the information. (Johnson)

C: There is no documentation. (King)

R: There is quite a bit of supporting research and I think that what we have based it on is supported by year's worth of research and there is a supporting research publication list that goes along with that. (Balsom)

C: But it's not documented in the report. (King)

R: This is a short recommendation and we didn't feel that it was necessary to go through all the literature for all that which is why have the supporting publications list. (Balsom)

R: Jan, in one section you say "under this scenario, loss of recreational camping this would be reduced to the extent possible by minimizing sediment transport." You cite Wright and Grams. But that can't possibly be true. Minimizing sediment transport would only occur under equalized monthly volumes. (Johnson)

R: I think we're looking at to the extent possible and these may be baby steps, but we're looking at things that we can do within all the constraints that we're working under. Is it a perfect scenario? No. Do we have a perfect scenario? I don't think we do. I think what we're looking at is where can we go to try to improve conditions given what we know about how the system operates. (Balsom)

R: Right and I guess what I'm saying is that it's not clear to me that this is improving conditions. It's not clear to me that this is resulting in any change whatsoever. What are the monthly volumes? If you weren't running under these parameters, ___ you are, and then take advantage of things like the mass balance bobble that was just published and ask yourself what are we getting for this. Are we actually getting improved sediment conservation in the system or not? (Johnson)

C: Rick is asking the same question that the power customers are asking themselves as we've discussed this whole thing. This looks like the federal family got together and you all agreed on this, but we don't know where

you're coming from and aren't sure you know where you're going. We would like to see some scientific support that says this plan will improve sediment and will help the chub and it will also cost so much and let's have some balance of how much we're gaining and is it worth what it is costing. (Barrett)

C: And again from my perspective I think the chub is one of my primary concerns in the canyon. I think we would need to hear a very sound justification from a departure from our current operations based on sound science that says we can expect even greater improvements under this modified operating criteria. (Benemelis)

R: I have to agree with what Perri is saying and Sam and others, I recognize that maybe you had conversations or discussions specifically about the chub or the endangered species or the effects of these modifications to have on those but it's really not reflected in this document at all. As we move forward, we're going to want to understand better how the proposal would affect or could affect or is expected to effect the chub populations. (Kowalski)

C: Also included in the document are additional high flows which based on the Saguaro Lake discussions, add further to the concern about the chub and the ability to effectively control RBT if we do all of this together at the same time. (Ostler)

C: The proposal from the federal family does not, at this point, include high flows. We're developing the HFE EA but the process hasn't gotten there yet. In response to the repeated statements that this is a departure, this is still within MLFF. We do not view this as a significant departure from previous operations. (Caramanian)

R: This IS a departure. (King)

R: It's a departure but it's within MLFF. (Caramanian)

Q: Why is it there? I understand that. (Benemelis)

C: Well, it's not even within MLFF if you include the caps on releases. (Barrett)

C: If it's within MLFF, why do you have to specify a prescriptive maximum release? You could say that it's anticipated that the releases under this would not exceed 16,000 but then that would be prescriptive because what you're doing is taking a subset of the MLFF flows. Take that out and say it's within MLFF and if that's what it turns out to be, but it's not prescriptive. It's anticipated, but the way it's written it's prescriptive. You will not exceed 16,000 cfs and that's where I have problem. (King)

R: Robert is entirely right. (Shields)

C: I think any changes have to be very carefully considered in the context of ongoing litigation. (Kowalski)

R: I can tell you that these changes were carefully considered and this is the federal family proposal. We view it as being within all existing legal requirements. (Caramanian)

Q: What is the specific answer to Robert's statement relative to the fourth bullet item where it says the daily peaks will be no greater than 16,000 cfs. What's in the ROD at the current time? How is that found to be consistent with it? If that's a limitation that's being written into this document, that's not found in the 1996 ROD. (Shields)

A: I don't think I want to get into a legal debate about what the ROD says and doesn't say. If you have technical questions about the hydrograph – (Caramanian)

R: It's not a technical question. It's a matter of there being a characterization of this being consistent with the ROD. Robert has pointed out that it is not. That's the issue that's on the table is consistency with the terms of the 1996 ROD. (Shields)

C: I can only repeat that we view it as being consistent. (Caramanian)

R: If it's consistent, why does it have to be in there? (King)

C: I will just repeat that I'm not going to get into a legal debate here. It's been pointed out more than once that this is a subject of ongoing litigation. We can answer your technical questions about this hydrograph. Malcolm is on the phone to do that. We're happy to discuss those questions but we're not going to get into a debate about what the ROD says or doesn't say. (Caramanian)

R: Well, you already have ma'am from the standpoint of making the statement time and time again that it's consistent with this when, in fact, inconsistency in a very important parameter relative to the daily amount of flow release is inconsistent with it. The statements that are made here is that consistency with the 1996 ROD that you have made repeatedly have been found to be in error. (Shields)

R: The actual wording of the 4th bullet says there will be no greater than 16,000 cfs with all other flow parameters of the current MLFF in place. This tells me this is outside the other parameters. You said it's not within MLFF. (Barrett)

R: The federal family proposal says what it says. (Caramanian)

Q: On table 8 on the maximum probably volume, given the situation with Unit 6 and I believe another unit is going to be up for turbine runner replacement, can those volumes be met without requiring any bypass? (James)

A: We do believe that is possible but I will check on that for you Leslie. (Wilson)

Shane said there was 25 minutes left on the call and the goal was to get a recommendation on the hydrograph. He asked if anyone wanted to make a different proposal. Hearing none, Rick proposed the following:

Motion (Proposed by Rick Johnson, seconded by Jerry Cox): If the annual volume forecast in the

2011 AOP is greater than 9.25 maf, then test Year-Round Steady Flows as it is described in the 1995 EIS on Glen Canyon Dam operations. If the forecast changes and the annual volume needs to be adjusted, then pro-rate monthly volumes to maintain the same pattern of monthly volumes.

- Regardless of the annual volume, implement a HFE under enriched sediment conditions as frequently as those coitions may recur.
- Specifics of any needed non-native control effort will be recommended by GCMRC.

Stakeholder	Vote	Stakeholder	Vote
Arizona Game and Fish Dept. (Stewart)	A	Grand Canyon Wildlands Council (Omana)	A
Bureau of Indian Affairs	absent	Federation of Fly Fishers (Jordan)	absent
Bureau of Reclamation (Knowles)	N	Grand Canyon River Guides (Cox)	Y
Hopi Tribe (Yeatts)	A	Arizona (Benemelis)	N
Hualapai Tribe	absent	California (Harris)	N
National Park Service – GRCA (Balsom)	A	Colorado (Kowalski)	N
National Park Service – GLNRA	absent	Nevada (Thiriot)	N
Navajo Nation	absent	New Mexico (Ostler)	N
Pueblo of Zuni	absent	Utah (King)	N
Southern Paiute Consortium	absent	Wyoming (Shields)	N
Fish and Wildlife Service (Spiller)	N	CREDA (James)	N
WAPA (Palmer)	N	UAMPS (Barrett)	N
Grand Canyon Trust (Johnson)	Y		

Voting Results: Yes = 2 No = 12 Abstaining = 4

Motion Fails

Abstentions count toward the quorum, but not the vote. For example, if 20 TWG members are present then a quorum is present (quorum=16). If the vote is 3-0-17 (that is 3 yes, 0 no, and 17 abstentions), the motion passes because abstentions are non-votes for all purposes other than to establish a quorum. To explain further, the simple majority or two-thirds majority is based on all votes minus the abstentions.

Shane asked if anyone wanted to propose the DOI-DOE motion. Hearing none, he presented language he had crafted because there wasn't a specific motion in the hydrograph: The TWG recommends to AMWG the hydrograph as proposed by the Federal agencies in the July 23, 2010 hydrograph recommendation for WY2011. Deanna said she felt the language was fine.

Motion (Proposed by Rick Johnson, seconded by Sam Spiller): The TWG recommends to AMWG the hydrograph as proposed by the Federal agencies in the July 23, 2010, hydrograph recommendation for WY2011.

C: We reviewed the DOI hydrograph and participated in its development. Hence, it has the DOI-DOE stamp. We agree with some of the comments and some of the scientific ties should be reviewed and revised. Although we haven't completed our modeling, we don't see an impact on power production of any consequence. (Palmer)

Q: I requested energy and capacity impacts for each of the three proposals so do you know when that information may be available? (James)

A: Normally our modeling is quick and easy. We've had some trouble with the two tier hydrograph. I will tell you that we will have impacts of what we consider of a modest consequence in the minimum probable scenario. We believe we will not show any impacts at all in the most probable scenario. We believe there may be some impacts to power in the maximum probable scenario, but we're still working on that. We're happy to complete our analysis through our modeling processes and provide to the TWG and AMWG before its discussion and I would say we'd be done – it shouldn't take more than a few hours but I'm just going to say we'll make them available to the TWG within a week. (Palmer)

Q: What are you using for your no action monthly volumes? (Johnson)

A: We're doing what DOI just did which was to look at other years of similar volumetric release. In the example that DOI sent out yesterday, they were looking at 1999 which was a volume that is similar to the volume in most probable for 2010. I don't know if that's the right year to look at so that's one of the reasons we don't have our modeling done. We do, however, want to respond clearly to Leslie James. She's right. We've done some spreadsheet analysis but haven't completed our modeling. We'll do that and I'll just say we'll have it out within a week. (Palmer)

Q: So in 1999 the forecast changed several times so the monthly volumes there would not be anywhere close to what they forecast at the beginning of the year? (Johnson)

A: That's the trouble with going back and trying to compare equal years. You can only make equal years if the forecast changes the same way in one year as it does another. (Palmer)

R: Adding to Clayton's caution, we note in the 1999 example and the graphs that were provided to you the biggest difference is that in Oct-Sep we didn't have steady flows as we have today. (Wilson)

Q: But you also have a huge jump in monthly volume from April to May that's due to that change in forecast, correct? (Johnson)

A: I believe that was the case. (Wilson)

C: I think it is very difficult for TWG to recommend to the AMWG to adopt this hydrograph without the information that has already been requested during this call. We've got information related to energy and capacity. We have information related to a more detailed science assessment so we understand what's going with respect to expected results and we also have a very significant question with respect to utilizing the bypass which has more than just power impacts. It has the Law of the River and other impacts. There are three basic questions and probably more that have been articulated during this call that make it very difficult to forward this recommendation by TWG without getting that. The suggestion I would have is this recommendation be forwarded to AMWG for consideration but also ask for the following information provided to AMWG so there could be a full discussion over the hydrograph. (Caan)

Shane said there are two options in George's comment: 1) don't change the motion, vote on it and if you disagree with the motion, then you would be compelled to vote no and convey to AMWG why the TWG voted no. Alternatively the makers of the motion could amend this motion to include some of those issues described by George.

Deanna said she was comfortable with George's proposal.

Shane asked if the makers of the motion are okay and would accept a friendly motion. Rick said he wanted to withdraw his motion. Sam said he was friendly with the 3-part proposal by George.

Motion (Proposed by Jason Thiriot, seconded by Sam Spiller): The TWG recommends to AMWG the hydrograph be considered as proposed by the Federal agencies on the July 23, 2010 hydrograph recommendation for WY2011. This consideration should include a more detailed explanation of the expected science results, proposed impacts on energy and capacity for each of the three scenarios, and any operational concerns related to any of the three scenarios.

Since this was a DOI federal family recommendation, she asked if the DOI representatives were comfortable with the motion language. Sam concurred with the language. Jan said she wanted to change "science" results to "resource" results. George concurred with the change. John said he wasn't sure what the implications were for GCMRC in terms of additional work that may be asking for but he was fine with the language.

Q: Would the expected resource results include the no action monthly volumes and also the mass balance model runs of the various scenarios? (Johnson)

A: I think to a certain degree. We had GCMRC and Ted and John weigh in on all those to see how we came to where we came to so I don't know how detailed we want to get in this. I think that's one of the things we would want to look at. (Balsom)

C: We would like to see enough detail to weigh the advantages. How much sediment do you gain? How much HBC? What happens to them? Weigh all things along with the power impacts. Some details are going to be required. (Barrett)

Q: Malcolm, Ann, or Glen, are you comfortable? (Archuleta)

A: Yes, we're comfortable with that. Jan, are you referring to some past model runs that Scott Wright may have done for the TWG? I'm not sure what modeling you're referring to. (Knowles)

R: I actually wasn't. When we were putting together this proposal and Glen since you were in transition at that point, GCMRC, John, and Ted weighed on sort of the concepts they were looking at. (Balsom)

C: Before we get into too much detail, I think we can have that conversation offline because we need to get to the specific language of the request and then we can put together a proposal and we can send that out the TWG and AMWG and see if there is anything else they'd like that they don't feel is getting covered in this request. I'd like to ask Clayton if they're comfortable with this as well. (Archuleta)

Attachment A

**draft Socio-economics ad hoc group report to TWG
for the July 27th conference call
(updated July 26)**

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TWG charge to ad hoc:

Review the final report of the GCMRC Socioeconomic Research Review Panel (dated February 26, 2010) and develop a recommendation for TWG or an update on progress for TWG review at its June 2010 meeting. Consider the technical feasibility and pros and cons of implementing the panel's recommendations. Also consider how to better utilize current resources in responding to the panel's recommendations.

The TWG Socio-economic Ad Hoc recommends to the TWG the following:

The TWG has received the report entitled "Final Report of the GCMRC Socioeconomic Research Review Panel" dated February 26, 2010. The ad hoc has discussed the workshop recommendations related to electrical power production and recreation surveys. The ad hoc intends to more fully consider the workshop report and all the recommendations after the August AMWG meeting, but acknowledges the need to make immediate recommendations now for the FY 2011 and 2012 BWP.

In general, the ad hoc supports a phased approach as described below:

- a) In FY 2011 and 2012 implement the highest priority-most expedient action items including the Base Case, and Change Case for electrical power, and Recreation Expenditure analyses. These have been identified as the highest priority-most expedient items, can likely be implemented without substantial costs to the program in these years, and represents "low hanging" fruit to get the process moving.
- b) In FY 2011 and 2012, begin the work of educating the program about market and non-market recreation economics, and utilize experts as needed to scope out the appropriate non-market (e.g., willingness to pay) economic work to be done and how specifically to do that in order to implement the workshop recommendations while tailoring those to the needs of the GCDAMP. This would include the "economics 101" course for TWG and AMWG, as well as planning sessions with GCMRC and working with other appropriate experts to develop a plan for implementing non-market economics study plan for the program.
- c) In FY 2012, or as soon as the non-market recreation planning is completed and satisfactory to the GCDAMP, begin implementation of the non-market recreational portion of these recommendations.

The ad hoc has developed the following recommendations. Additional expertise (and funding) may be needed at GCRMC to implement the following tasks:

Base Case analysis: Implement the report recommendation to complete base and change case studies for hydroelectric operations in FY 2010. The detailed description of the base case study will be prepared by GCMRC, in collaboration/cooperation with input from WAPA and appropriate experts, based on the description in the Socioeconomic Panel's report and any additional specifications by the TWG/AMWG. This base case study will include an analysis of "spill over" with the WECC. The base case and spill over analysis will be completed by WAPA and a report prepared at no cost to the AMP. The report will be submitted by WAPA to GCMRC for peer review. GCMRC will oversee the peer review process and use the Science Advisors (i.e., Dave Garrett or other expert) as needed. WAPA will incorporate changes into the report based on comments received from the peer review process.

Attachment A

Include the funding and the need as a line item in the 2011/12 budget, workplan and hydrograph.

Change Case analysis (power modeling): will be done by WAPA based on tasks provided by GCMRC, developed by GCMRC with input ~~collaboration cooperation with~~ from WAPA and appropriate experts, based on the description in the Socioeconomic Panel's report and any additional specifications by the TWG/AMWG.

Recreation Expenditure analysis (market): We recommend that an analysis of data related to the regional economic effects of GCD experiments and other DOI actions be undertaken. This analysis would be devoted to the impact on the regional economy as a result of changes in expenditures resulting from these actions.

The groups of interest for this study would be Glen Canyon ~~day use rafters and anglers~~ and Grand Canyon ~~Whitewater rafting of commercial and private boaters from Lees Ferry to Diamond Creek or Lake Mead day use and white water outfitters~~ and ~~the well as the the~~ Hualapai white water recreational enterprise that services Diamond Creek to Lake Mead.

This expenditure data can be used in the IMPLAN regional input-output model to estimate the positive economic impacts to the surrounding counties and Indian Reservations in terms of direct and indirect personal income and employment generated. Indirect effects would capture the multiplier effects from subsequent rounds of spending in the surrounding region. Separate interviews with the guides and the tribes will be needed to obtain their expenditures associated with the guiding, access fees, food, and other costs. We recommend that the economic impact analysis use two impact areas. For consistency with past research, it would be appropriate to use the counties surrounding the Grand Canyon. However, since many outfitters have their base of operation in Nevada or Salt Lake City, it would be appropriate to show results using a broader multi-state economic impact area (Report page 16). This project would replace GCMRC Project 9.04.11-12.

Provide training to AMP stakeholders on use and non-use values: (implement in FY 2011 or 2012), economics 101 as described in the report. To be ~~organized and hosted~~ ~~coordinated~~ by GCMRC with ~~financial support~~ ~~help~~ from WAPA.

Other studies including non-market recreation studies which will be considered further during the ad hoc review of the report and implemented under the time frame described above:

a) Implement non-market recreation surveys of Glen Canyon anglers and day-use rafters

b) Identify tribes and consider specific surveys of preferences and attitudes

~~e) Provide training to AMP stakeholders on non-use values~~

b)

~~e)c)~~ Conduct power flow studies that show the financial and economic consequences of Glen Canyon management alternatives on WAPA, WAPA customers, and the Upper Basin Fund

~~e)d)~~ Conduct focus groups and piloting of non-use value survey (initiate OMB clearance)

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Attachment B

Draft report to TWG from the GCMP ad hoc group July 14, 2010

The charge (established March 15, 2010):

Develop, for TWG review at its June 2010 meeting, an appendix for the General Core Monitoring Plan (Plan) which describes a TWG process for making recommendations to AMWG on the individual core monitoring plans developed by GCMRC. Review the revised draft Plan from GCMRC this spring and develop a recommendation for TWG at its June 2010 meeting.

The ad hoc group waited until a revised draft GCMP was provided by GCMRC at the June TWG meeting before beginning their work. Additional guidance was given to the ad hoc to review the draft revision of the plan and provide a recommendation to TWG at its next meeting. Generally, the ad hoc was to review the changes made by GCMRC and determine if they were responsive to the comments and suggestions made by TWG.

In general, GCMRC was responsive in including recommended changes to the document which improved organization and clarity regarding chapters 1-3, and Appendix A. GCMRC also included new concepts proposed by TWG such as the use of criteria in developing programs (e.g., priority setting, confidence in program success, adequacy to answer critical questions), and the use of trade-off analyses and risk assessment. The use of these collaborative processes between TWG and GCMRC is envisioned by GCMRC to occur during “step 4” of the process.

Although these changes were made, it is the view of the ad hoc that GCMRC selectively declined to make changes in programmatic areas which would substantially change the development process. For example, Chapter 4 retains all of the funding needs and program plans which were in the first draft and which seem to codify current programs before going through the process to determine current needs for core monitoring. GCMRC argues that they have implemented the CMINS and GCDAMP priorities as they exist but also acknowledge they may be out of date. Although they have asked for further guidance on how to implement these guidelines, they have selectively declined those types of comments provided in comment form and in the revision provided by TWG. There are a series of critical needs identified by the ad hoc (and TWG comments on the first draft), that have been declined by GCMRC for incorporation into the document. Thus, the ad hoc proposes the following draft motion to AMWG for consideration by TWG:

TWG recommends that AMWG consider the following changes to be requested in the draft General Core Monitoring Plan:

1. Remove Chapter 4 which includes descriptions of the individual plans to be funded based on full implementation of the CMINS without priority setting. These individual plans will be developed, and leave these descriptions for when the plans are developed in coordination with TWG. Also delete sections 3.3.1 and 3.3.4 which identify staffing needs and costs based on the plans in Chapter 4.
2. Comments were provided by TWG of past discussions which envisioned a core monitoring program in the realm of 40-60% of the science budget; these recommendations were declined by GCMRC. TWG would like to develop a core monitoring program that uses trade-off analyses and risk assessment to develop a less-costly program than GCMRC has developed. This approach should be described in Chapter 1 (history) and implemented in Chapter 3 (planning). The general concept is to prioritize projects and implement a program that doesn't include all the “ornaments” on the tree that is generally described by responding to all of the CMINS. Some of the work may

Comment [d1]: Do you mean to say, in a separate sentence, “Rather, these descriptions will be included in the core monitoring plans when they are developed in coordination with the TWG.”

Attachment B

be titled “core monitoring” and receive priority funding while other work may need to be funded as monitoring work which would be subject to biennial review based on availability of funds.

- ~~GCMRC should work with TWG to more fully develop the management process described in Chapter 3, and as was described in the revision, to embrace a collaborative process to develop the core monitoring plans without bias in the outcomes of what will be funded and to what extent they will be funded. In other words, just because we have worked to develop broad programs, TWG expects that now we will go back and re-evaluate needs, criteria, precision, frequency, and priorities for the monitoring program.~~GCMRC should work with TWG to more fully develop the management process described in Chapter 3, and as was described in the revision, to embrace a collaborative process to develop the core monitoring plans without bias in the outcomes of what will be funded and to what extent they will be funded. In other words, despite the fact that GCMRC and the GCDAMP have worked to develop broad programs, TWG believes that we now need to go back and re-evaluate needs, criteria, precision, frequency, and priorities for a core monitoring program.

Attachment C
Provisional Recommendations for WY2011 hydrograph:
Grand Canyon Trust

The purpose of these recommendations is to advise the Secretary of the Interior on how best to meet the intent of the Grand Canyon Protection Act. The Act states that the Secretary is to operate the dam, and implement other actions, to protect, mitigate adverse impacts to, and improve park values.

Sediment, *per se*, is one of the many park values addressed by the GCPA. Current implementation of MLFF results in the long-term erosion of sediment and does not meet the GCPA's intent to protect, mitigate adverse impacts to, and improve park values. Under the 11 maf annual volume currently forecast for WY 2011, modeling suggests that implementation of MLFF would result in the loss of approximately 575,000 metric tons of sediment in Marble Canyon and Eastern Grand Canyon.

The intent of these WY2011 proposed hydrographs is to experiment with an alternative flow regime to achieve a neutral or positive mass balance of sediment in the Colorado River Ecosystem and improve, or at least not harm, other park values.

Monthly volumes and daily fluctuations

Mass balance sediment modeling by GCMRC suggests that with 8.23 maf release years, and average sediment inputs, all six of the modeled operating scenarios will result in a positive mass balance in Marble Canyon and Eastern Grand Canyon. We recommend testing SASF because it not only retains sediment, but it is the only scenario that mimics the natural hydrograph, another park value addressed by the GCPA. We recommend that:

If the annual release volume for WY 2011 is forecast to be between 8.23 and 9.25 maf in the 2011 AOP, then test SASF as it is described in the 1995 EIS on Glen Canyon Dam operations. If the forecast changes and the annual volume needs to be adjusted, then pro-rate monthly volumes to maintain the same pattern of monthly volumes.

Mass balance sediment modeling by GCMRC suggests that with 11.0 maf release years, only Year-Round Steady Flows will result in a positive mass balance of sediment in Marble Canyon and Eastern Grand Canyon. We recommend that:

If the annual volume forecast in the 2011 AOP is greater than 9.25 maf, then test Year-Round Steady Flows as it is described in the 1995 EIS on Glen Canyon Dam operations. If the forecast changes and the annual volume needs to be adjusted, then pro-rate monthly volumes to maintain the same pattern of monthly volumes.

High Flow Experiment

The criteria for triggering a HFE, and the timing, magnitude, and duration of the flow will be determined by the HFE protocol EA decision. If that is not available, then utilize either the criteria used to trigger the 2008 HFE, or revised criteria recommended by GCMRC. We recommend that:

Regardless of the annual volume, implement a HFE under enriched sediment conditions as

frequently as those conditions may recur.

Other actions

It may be necessary to control non-native predators and competitors that may benefit from a HFE. Specifics of the needed control effort are yet to be determined.

It is anticipated that GCMRC, NPS and other agency scientists will review this and any other proposed hydrographs for WY 2011 to determine their effect on park resources. We also anticipate that GCMRC will provide leadership in developing the specific science questions, and making any needed modifications to the hydrographs to improve the scientific merits and/or increase the potential benefits to park values.

Whetton, Linda A

From: Rick Johnson [richard.johnson@npgcable.com]
Sent: Friday, July 30, 2010 1:19 PM
To: Rick Johnson
Cc: Whetton, Linda A; Balsom, Jan; Barger, Mary; Barrett, Clifford; Bills, Debra; Bullets, Charley; Capron, Shane; Caramanian, Lori; Christensen, Kerry; Cox, Jerry; Crawford, Marianne; Davis, William E.; Dongoske, Kurt; Harris, Christopher S.; Henderson, Norm; Heuslein, Amy; Jordan, John; King, Robert; Knowles, Glen W; Kowalski, Ted; Kubly, Dennis M; Noojibail, Gopaul; Orton, Mary; Persons, William R; Peterson, McClain; Shields, John W.; Spiller, Sam; Sponholtz, Pam; Stevens, Larry; Stewart, Bill; Wegner, David; Yazzie, Curtis; Yeatts, Michael; Benemelis, Perri; Cantley, Garry; Jackson-Kelly, Loretta; James, Leslie; Jansen, Sam; Lash, Nikola; Makinster, Andy; Omama, Emily; Ostler, Don; Palmer, S. Clayton; Thiriot, James; pwicker9@msn.com; Andersen, Matthew E; Bennett, Glenn E; Daugherty, Mary M; Fairley, Helen; Grams, Paul E; Hamill, John F; Kitchell, Kate; Mankiller, Serena; Melis, Ted; Sogge, Mark K
Subject: Re: TWG call July 27 9-12 MDT
Attachments: 2011 monthly volumes.xls; ATT00001.txt
Importance: High

Greetings,

I've attached a simple Excel spreadsheet with monthly volumes for three alternative hydrographs: 1) the monthly volumes supplied in the 11 June 2010 budget and workplan; 2) the most probable inflow scenario from the 23 July 2010 DOI/DOE hydrograph recommendations; and 3) the GCT 2011 hydrograph proposal. Note that #1 may need to be adjusted because it assumes a 11.15 maf year, while the other two assume a 11.5 maf year.

Daily fluctuations for #1 above are provided in the budget and workplan workplan (see page 10). Daily fluctuations for #2 presumably would follow bullet #4 in the 23 July 2010 DOI/DOE hydrograph recommendations. And daily fluctuations for #3 are steady.

As I requested previously, I believe that for AMWG to make an informed recommendation to the Secretary, they need at least the following resource analysis (with documentation) for at least the three hydrographs listed above:

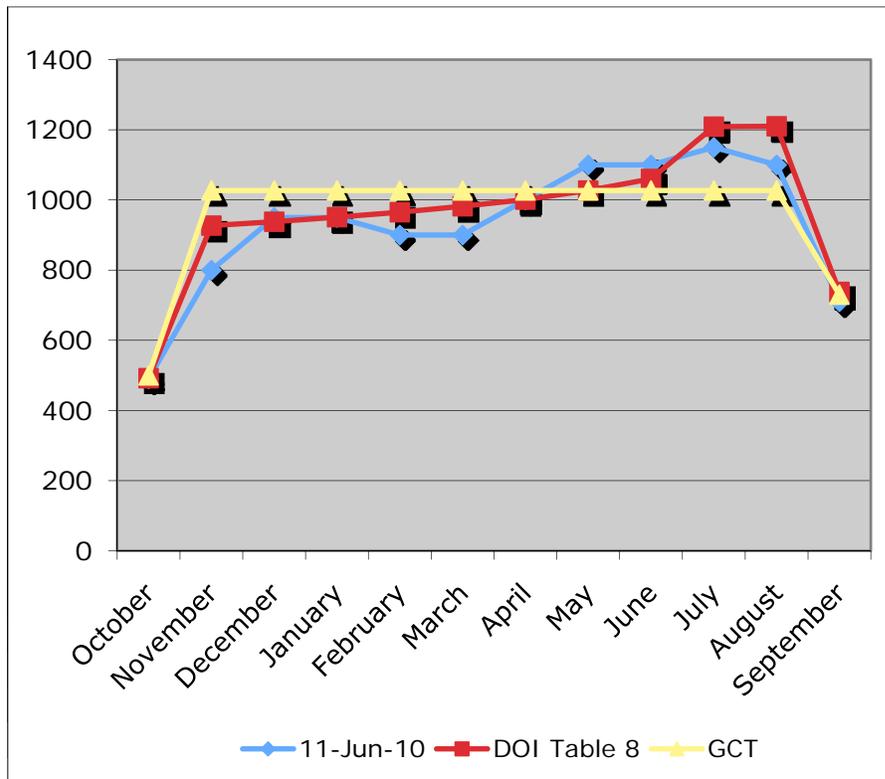
1. Sediment mass balance.
2. Hydropower impacts.
3. Impacts to temperature, humpback chub, and other native fish.

Regards,
Rick

Attachment C

11-Jun-10 DOI Table 8 GCT

October	490	492	500
November	800	927	1027
December	950	938	1027
January	950	951	1027
February	900	965	1027
March	900	982	1027
April	1000	1001	1027
May	1100	1027	1027
June	1100	1060	1027
July	1150	1209	1027
August	1100	1210	1027
September	710	738	730
	11150	11500	11500



DEPARTMENT OF THE INTERIOR AND DEPARTMENT OF ENERGY
OPERATING HYDROGRAPH RECOMMENDATIONS
FOR GLEN CANYON DAM

July 23, 2010

Introduction: The Federal agencies involved in the Glen Canyon Dam Adaptive Management program have jointly drafted this recommendation for the projected operation of Glen Canyon Dam in 2011. This recommendation is consistent with the Law of the River and the Grand Canyon Protection Act, which states that the Secretary of Interior will operate Glen Canyon Dam “in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use.” This recommendation is designed to enhance protection of downstream resources. It can be implemented consistent with existing environmental and operational limitations applicable to Glen Canyon Dam, the annual release requirements of the 2007 Interim Guidelines, applicable operating limitations for Glen Canyon Dam, and the 1996 Glen Canyon Dam Record of Decision (ROD). This approach to operations does not modify the Interim Guidelines, operating criteria or ROD and is an adaptive management-based experimental approach to 2011 operations that falls within the parameters of the Modified Low Fluctuating Flow alternative adopted in the ROD.

The National Park Service and U.S. Fish and Wildlife Service provided the initial draft of the operational concepts included in the recommendation to enhance protection of downstream resources. The Bureau of Reclamation provided technical support, clarifications, and refinements to assure these operational concepts would be consistent with the annual release requirements of the Interim Guidelines and applicable operational limitations for Glen Canyon Dam. The Bureau of Indian Affairs has had the opportunity to participate in the development of this recommendation and has reviewed the drafts. The USGS Grand Canyon Monitoring and Research Center has reviewed this recommendation and added its comments. Western Area Power Administration has evaluated the recommendation, participated in discussions concerning its operational impacts, and supports it.

It is Interior’s intention to share this proposed recommendation with stakeholders in the Glen Canyon Dam Adaptive Management Work Group prior to the beginning of the 2011 water year, so as to provide an opportunity for input from the participating AMWG stakeholders. It is also Interior’s intention to include a projected operation for Glen Canyon Dam during the 2011 water year in a Draft 2011 Annual Operating Plan for Colorado River Reservoirs at the earliest appropriate opportunity. In addition, language will be added to the 2011 Annual Operating Plan to reference the ongoing NEPA process

to develop an Experimental Protocol for High-Flow Releases from Glen Canyon Dam, and such language will note that pending completion of the ongoing NEPA process, if a high-flow release is undertaken in Water Year 2011, projected operations of Glen Canyon Dam will be modified consistent with the final experimental protocol. A draft of the information proposed to be added to the Draft 2011 AOP is attached as Attachment 1 to this summary.

Purpose: To develop recommendations for operational 2011 hydrographs based on anticipated possible annual release volumes for Water Year 2011 from Glen Canyon Dam consistent with Section 1802 of the Grand Canyon Protection Act. The operational hydrographs are within the framework of the 1996 Record of Decision and Modified Low Fluctuating Flow (MLFF) operation, consistent with balancing other resources, including power production, and recognize the variability of possible annual release volumes from Glen Canyon Dam under the 2007 Interim Guidelines.

The concept is to apply sound science principles within the framework of adaptive management to adjust the timing of water deliveries to protect and restore flow-dependent resource conditions. The fundamental principle is conservation of the sand resource in order to minimize sand export to Lake Mead and degradation of sandbar resources within the Colorado River ecosystem (CRE). (Note: Recently, a new sand routing model was developed for the CRE [Wright and others, 2010] that evaluates a variety of operational hydrographs from Glen Canyon Dam [including typical MLFF releases] using average annual sand production from both the Paria and Little Colorado Rivers.)

Two scenarios are presented below based upon the range of probable 2011 water year releases from Glen Canyon Dam. It is anticipated that the annual release volumes would likely fall within two sets of annual operations as described below. The agencies expect that the projected releases will be modified as the year progresses to address changing conditions in the same manner as typically occurs. Proposed parameters for such ongoing operational modifications are also provided.

Water Year Scenario #1: 8.23 – 9.0 million acre feet (maf) - Balancing

Objective: To implement reasonable measures to minimize export of tributary sand inputs delivered to the main channel so as to benefit the lower elevation ecosystem of Grand Canyon National Park, including the ecological processes and functions that affect native flora and fauna, archeological and cultural resources, recreation uses, and other values for which Grand Canyon National Park was established.

Science Principles: For any given annual volume of water released from the dam, sand export is known to be minimized by reducing daily/monthly/seasonal variations in dam

releases. (Rubin and others, 2002; Wright and others, 2005; Wright and others, 2008; ASCE, 1975; USDOJ, 1995; Topping and others, 2006).

Proposed Operating Parameters:

- Monthly Release Volumes will be adjusted each month based on the most current forecast of the annual release required by the 2007 Interim Guidelines.
- Monthly Release Volumes will vary within a range of +/- 100,000 acre-feet from the Average Monthly Release Volume over the water year (defined in the next bullet). This monthly operational flexibility will be used for existing power production operations under the Modified Low Fluctuating Flow (MLFF) alternative selected by the 1996 ROD and contained in the 1995 FEIS. Modifications of monthly release volumes will be made in consultation with Western Area Power Administration.
- Average Monthly Release Volumes will be the amount of remaining water to release for the water year divided by the remaining months in the water year (excluding the September/October steady flows).
- Daily peaks will be no greater than 16,000 cubic feet per second (cfs), with all other flow parameters of the current MLFF in place.
- Steady flows in September and October per the 2008 HFE Environmental Assessment (EA), with monthly volumes of approximately 500,000 to 600,000 acre feet (about 8,000 to 10,000 cfs).

Expected Resource Results: Under this scenario, at the lower release volume of 8.23 maf, accumulation of some portion of new tributary sand inputs would likely occur in both Marble and Grand Canyons (Wright and Grams, 2010), but it is less certain that any new sand inputs would accumulate at the higher 9.0 maf volume. Recreational camping beaches would be expected to continue to degrade at previously reported rates associated with MLFF, with perhaps lower erosion rates of camps in summer and winter months (Kaplinski and others, 2005). It is not expected that there would be an increase in size and distribution of camping beaches throughout the river corridor; recreational rafting safety would be unaffected. Terrestrial and river edge aquatic riparian habitats, archaeological sites and historic properties would show no improvement. With lower summer peaks associated with this scenario there may be some vegetation encroachment on sand bars and camping beaches.

Water Year Scenario #2: Above 9.0 million acre feet (maf) - Equalization

Objectives: To implement reasonable measures to minimize erosion of sandbar deposits for purposes of reducing degradation to the lower elevation ecosystem of Grand Canyon National Park, including the ecological processes and functions that affect native flora and fauna, archeological and cultural resources, recreation uses, and other values for which Grand Canyon National Park was established.

Science Principle: For any given annual volume release of water, sandbar erosion and sediment transport is minimized by reducing both daily/monthly/seasonal variations in volume releases, and by minimizing subsequent daily variations in discharges. (Rubin and others, 2002; Wright and others, 2005; Wright and others, 2008; ASCE, 1975; USDOJ, 1995; Topping and others, 2006).

Proposed Operating Parameters:

- Monthly Release Volumes will be adjusted each month based on the most current forecast of the annual release required by the 2007 Interim Guidelines.
- Monthly Release Volumes will vary within a range of +/- 100,000 acre-feet from the Average Monthly Release Volume over the water year (defined in the next bullet). This operational flexibility will be used for existing power production operations under the Modified Low Fluctuating Flow (MLFF) alternative selected by the 1996 ROD and contained in the 1995 FEIS. Modifications of monthly release volumes will be made in consultation with Western Area Power Administration.
- Average Monthly Release Volumes will be the amount of remaining water to release for the water year divided by the remaining months in the water year (excluding the September/October steady flows).
- Daily peaks will be no greater than 22,000 cfs, with all other flow parameters of the current MLFF in place (including daily range in fluctuating flows up to 8,000 cfs), including the fall steady flows required in the 2008 High Flow Experiment Environmental Assessment (2008 HFE EA).
- Steady flows in September and October per the 2008 HFE Environmental Assessment (EA).

Expected Resource Results: Under this scenario, loss of recreational camping beaches would be reduced to the extent possible by minimizing sediment transport (Wright and Grams, 2010). Recreational rafting values may benefit from the more limited fluctuations. Terrestrial and aquatic river edge riparian habitats and archaeological sites may continue to degrade, but the amount of loss may be reduced under this recommended flow regime.

Supporting Research Publications

ASCE, 1975, Sedimentation Engineering, Vanoni, V.A. ed.: ASCE Manuals and Reports on Engineering Practice, no. 54, 745 p.

Gloss, Steven P., Jeffrey E. Lovich, and Theodore S. Melis, 2005. The State of the Colorado River Ecosystem in Grand Canyon: A Report of the Grand Canyon Monitoring and Research Center 1991–2004, USGS Circular 1282

Grams and others, 2010, 2008 High-Flow Experiment at Glen Canyon Dam: Morphologic Response of Eddy-Deposited Sandbars and Associated Aquatic Backwater Habitats along the Colorado River in Grand Canyon, Paul E. Grams, John C. Schmidt, Matthew E. Andersen [currently available at www.gcmrc.gov and <http://www.usgs.gov/pubprod/pubs.html> as U.S. Geological Survey Open File Report 2010-1032],

Hazel and others, 2010, Sandbar Response Following the 2008 High-Flow Experiment on the Colorado River in Marble and Grand Canyons, Arizona, Joe E. Hazel Jr., Paul E. Grams, John C. Schmidt and Matt Kaplinski [currently available at: www.gcmrc.gov and <http://www.usgs.gov/pubprod/pubs.html> as U.S. Geological Survey Scientific Research Investigations Report 2010-5015]Kaplinski, M., 2005, State of the Colorado River Ecosystem, *in* eds. Gloss and others, U.S. Geological Survey Circular 1282, Chapter 12, pp. 193-206

Melis, T.S., and several other authors, 2010, 2008 High-Flow Experiment at Glen Canyon Dam Benefits Colorado River Resources in Grand Canyon National Park, U.S. Geological Survey Fact Sheet 2010-3009, 4 p.

Melis, T.S., Topping, D.J., Rubin, D.M., Wright, S.A.
2007 Research furthers conservation of Grand Canyon sandbars: *U.S. Geological Survey Fact Sheet* 2007-3020, 4 p.

Rubin, D.M., Topping, D.J., Schmidt, J.C., Hazel, J., Kaplinski, M., and Melis, T.S.
2002 Recent sediment studies refute Glen Canyon Dam hypothesis: *Eos*, Transactions, American Geophysical Union, Vol. 83, No. 25, 18 June 2002, Pages 273, 277-278

Topping, D.J., Rubin, D.M., Schmidt, J.C., Hazel, J.E., Jr., Melis, T.S., Wright, S.A., Kaplinski, M., Draut, A.E., and Breedlove, M.J. 2006 Comparison of sediment-transport and bar-response results from the 1996 and 2004 controlled-flood experiments on the Colorado River in Grand Canyon: CD-ROM *Proceedings of the 8th Federal Inter-Agency Sedimentation Conference*, Reno, Nevada, April 2-6, 2006, ISBN 0-9779007-1-1.

U.S. Department of the Interior, 1995 Final Environmental Impact Statement on the Operation of Glen Canyon Dam. Bureau of Reclamation, U.S. Government Printing Office, Denver.

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Attachment 1 – Information Proposed for inclusion in the Draft 2011 Annual Operating Plan (note: Table 9 metric conversion will be compiled)

Table 8. Range of Projected Monthly Releases from Lake Powell Under Water Year 2011 Inflow Scenarios (English Units)¹

Month	Minimum Probable Inflow Scenario Projected Monthly Release Volume 11.5 maf dropping to 9 maf in March	Most Probable Inflow Scenario Projected Monthly Release Volume at Remaining at 11.5 maf	Maximum Probable Inflow Scenario Projected Monthly Release Volume 11.5 maf increasing to 13 maf/yr in Feb/March
October 2010	492	492	492
November 2010	927	927	927
December 2010	938	938	938
January 2011	951	951	951
February 2011	965	965	965
March 2011	982	982	1065
April 2011	554	1001	1266
May 2011	579	1027	1390
June 2011	612	1060	1391
July 2011	724	1209	1391
August 2011	800	1210	1391
September 2011	476	738	833
Water Year 2011	9 maf	11.5 maf	13 maf

Units are in 1,000 af/month.

Most and Max Probable will likely be adjusted somewhat in August 24 Month Study based on that month's forecast. These numbers should be fairly representative of the range of possibilities.

New Text proposed to be added to June 1, 2010 Draft AOP on page 30, at ln. 4:

On December 10, 2009, Secretary of the Interior Ken Salazar announced that the Department of the Interior would initiate development of a High-Flow Experimental Protocol (Protocol) for releases from Glen Canyon Dam as part of the ongoing implementation of the Glen Canyon Dam Adaptive Management Program (AMP). High-flow experimental releases have been undertaken in the past and will be further analyzed and implemented pursuant to the direction of the Secretary to assess the ability of such releases to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established. As part of the AMP, the Department's effort to develop the Protocol is a component of its ongoing responsibility to comply with the requirements and obligations established by the Grand Canyon Protection Act of 1992 (Pub. L. 102-575) (GCPA). Further information on the Protocol may be found at 74 Fed. Reg. 69361 (Dec. 31, 2009).

The High-Flow Experimental Protocol is currently the subject of an ongoing analysis, including analysis pursuant to NEPA. The Department anticipates that the Protocol is likely to be completed during Water Year 2011. Pending completion of the ongoing NEPA process, if a high-flow release is undertaken in Water Year 2011, projected operations of Glen Canyon Dam will be modified consistent with the final experimental protocol. Implementation of an experimental high-flow release will modify the projected releases for Water Year 2011 displayed in Tables 8 and 9.