

Glen Canyon Dam Adaptive Management Work Group
Conference Call Final Meeting Minutes
January 29, 2004

Conducting: Michael Gabaldon, Secretary's Designee

AMWG Members:

Joe Alston, NPS
D. Larry Anderson, UDWR
Darryl Beckmann, USBR
Robert Begay, Navajo Nation
Amy Heuslein, BIA
Pamela Hyde, Gr. Canyon Wildlands Council
Leslie James, CREDA

Phillip Lehr, Colo. River Commission/NV
Clayton Palmer, WAPA
Andre Potochnik, GCRG
Nikolai Ramsey, Grand Canyon Trust
John Shields, WY State Engr. Office
Mark Steffen, Federation of Fly Fishers
Jerry Zimmerman, Colo. River Board of Calif.

Alternates:

Matt Kaplinski
Glen Knowles
Bill Persons
Mike Yeatts

For:

Andre Potochnik, GCRG
Sam Spiller, USFWS
Bruce Taubert, AGFD
Leigh Kuwanwisiwma, The Hopi Tribe

Interested Persons:

Wayne Cook, UCRC
Bill Davis, CREDA
Phil Davis, USGS/GCMRC
Christopher Harris, Colo. River Board of CA
Norm Henderson, TWG Chairperson
Dennis Kubly, USBR

Ken McMullen, GCNP
Jeff Lovich, USGS/GCMRC
Bob Lynch, Attorney at Law
Randy Peterson, USBR
Tom Ryan, USBR

Meeting Recorder: Linda Whetton

Welcome and Introductions. The participants introduced themselves. A quorum (15 members) was present.

Purpose of Conference Call - Mike said the conference call would focus on two issues, the WAPA Flow Proposal for FY 2004, and proposed changes in remote sensing.

Discussion of Federal Register Notice. Pam asked for an explanation of how the language in the Federal Register Notice dated January 28, 2004 (**Attachment 1**) meets the requirements of the Federal Advisory Committee Act, Section 102-3.150(b) which reads:

“In exceptional circumstances, the agency or an independent Presidential advisory committee may give less than 15 calendar days notice, provided that the reasons for doing so are included in the advisory committee meeting notice published in the **Federal Register**.”

Pam expressed concern that there wasn't sufficient time for the public to be informed to participate in the conference call and didn't feel that the wording in the notice "this notice may be published in a shorter time frame period than normally required by the Federal Advisory Committee Act" fell under the exceptional circumstances category.

Dennis asked Pam if she felt that there were some members of the public who did not know about the call and wouldn't be on the conference call. Pam responded that that was one of her concerns but felt strongly that AMWG was not meeting its legal requirements under FACA. If the conference call couldn't be noticed in the Federal Register in time, the usual procedure would be to postpone the call until the 15-day requirement could be met.

Leslie reminded Pam that the WAPA Flow Proposal was the subject of a conference call scheduled for Dec. 17, 2003, which was noticed in the Federal Register, but that it only received about 5 minutes of discussion because of the other agenda item. She added that the TWG had also discussed the topic at their last two meetings (Nov 2003 and Feb 2004) and didn't think that today's discussion would be a surprise to anyone or the public.

Randy said Reclamation could have done a better job in scheduling the call but felt the real core of the exceptional circumstance might have been the issue of a large amount of public power customer dollars that may or may not be affected by the proposal at a cost \$2 million a month. He said Reclamation doesn't routinely do business that way and would comply with the any and all regulations in the future.

Pam went on to say that she doesn't think an apology would be sufficient in court and corrected Randy that it wasn't power customer dollars but rather power revenue dollars that would be affected by WAPA's flow proposal. Pam said she would be happy to make a motion to cancel the meeting until it could be properly noticed.

Mike asked what the consequences would be of postponing the call for possibly another 15 days.

Wayne said it would cost another \$3 million. He said that the AMWG had the opportunity to approve the flow proposal a month ago and chose not, and that month's delay probably incurred another \$2.5 million in costs with the Federal expenditures and another month's delay.

Pam said she didn't want to keep the group from continuing the conference call but wanted her objections noted. She doesn't condone playing fast and loose with the laws that govern the Federal Advisory body. She added that she'd be happy to vote on the issue but it was under her registered objection for holding the conference call and essentially, she considered the meeting not legal.

Jerry asked if Reclamation had an attorney who could issue a decision. Mike responded that Reclamation didn't have an attorney who could render a quick interpretation or decision on the FACA regulations.

Bob Lynch said he wasn't an AMWG member but as an attorney thought he might be of some assistance and is familiar with the FACA regulations. He said if there were any actions taken, it would be taken against Reclamation because they oversee the administration of the AMWG. He

added that continuing the conference call has no legal bearing on the AMWG's decision to approve or disapprove the flow proposal. Reclamation has the responsibility to make the decision and has invited the AMWG's participation as a matter of courtesy. The AMWG does not make decisions, it advises the Secretary.

Pam said she didn't want to be blamed for holding up the business of the conference call and suggested that the AMWG either decide to postpone the call or they could proceed with her objections noted. The call continued with Pam's objections noted for the record.

Discussion of WAPA Flow Proposal (Attachment 2). Randy said comments from the group and GCMRC's assessment of the resource impacts of the proposal would direct Reclamation's action on the proposal.

Jeff said he sent an e-mail message last night providing an addendum (**Attachment 3a**) to his original memo (**Attachment 3b**) which described GCMRC's scientific opinion on the effects of the proposed WAPA flows proposal on resources.

Leslie asked Jeff to summarize the most important points.

Jeff said they do not believe the proposed modification will have any material effect on Humpback Chub survival or recruitment. They also don't believe the food base will be materially affected. They don't think there would be a big increase in the area exposed between 5,000-8,000 cfs.

Mike asked Clayton to talk about the proposal and then suggested having Norm Henderson present the TWG's response.

Clayton said that last year the non-native fish suppression flows were 5,000 - 20,000 cfs, The 20,000 cfs occurred for 9 hours, ramp up was at 5,000 cfs per hour and ramp down was 2,500 cfs per hour. Ramp up began at 10:00 p.m. and so there was 3 hours of ramp up. Glen Canyon was releasing 20,000 cfs starting at 1 a.m. There were 6 hours of ramp down. The remaining night hours were at 5,000 cfs. WAPA was aware of the problems that occurred with respect to meeting contractual obligations and that their customers had some flexibility and started to schedule electrical power from the CRSP at 7 a.m. or so. They had 4 or 5 hours of time in which Glen Canyon was either at 5,000 cfs or ramping up. Their customers were submitting schedules for electrical power to meet contractual obligations. WAPA knew ahead of the experiment that the conditions were dry in the rest of the basin and there was very little water to release out of the Aspinall Units or out of Flaming Gorge to make up for that. However, they didn't anticipate not being able to find electrical power on the market to meet those loads and scheduled requirements in the early morning hours. What they thought was going to be financially an improvement over the ROD turned out to be financially detrimental against the ROD once the experiment was completed. WAPA met with the Bureau in October 2003 and tried to design some changes in the experiment and then took that information to the TWG in November. Subsequently, WAPA changed the experiment in that instead of 9 total hours, there would be 11 total hours in which Glen Canyon would release 20,000 cfs and ramp up would start at 8 a.m. instead of 10 a.m. but all the other parameters of the experiment would remain the same. They added 2 hours to the

20,000 cfs release over the course of the day. Because adding 2 hours to the experimental release to the 20,000 cfs experimental release over the course of the day uses more water, they had to find an 8.23 maf year in which they could take water. They discussed the matter with the TWG. The TWG offered a couple of options when Clayton first met with the TWG but after further discussion, it was decided to reduce or eliminate the peak on Sunday so that the Sunday flows would be 5,000 cfs, from 7 p.m. to 7 a.m. and then 8,000 cfs from 7 a.m. to 7 p.m. during the day time. WAPA decided to take the water out of Sunday as part of their proposal because one of the comments they received was that last year over the course of the experiment some of the impact to trout was not so much dewatering the trout redds but rather inducing some sort of a mortality through a high thermal regime that occurred in the early morning hours so there was a fair amount of time in the morning with sunlight that created thermal regimes over existing trout redds that induced mortality. One of the comments from GCMRC was that if WAPA's proposal of 11 hours at 20,000 cfs was implemented, there would not be as much of a thermally induced mortality and that's why they proposed to take the water out of Sunday to have a low flow all day Sunday.

Leslie asked Clayton to describe his actual experience and the economic impacts he talked about at the last TWG meeting.

Clayton said that WAPA wanted to make sure that potential management actions that might be suggested to the Secretary as a result of the experiment were compatible with Federal commitments for delivering electrical power. Since the experiment started in January, WAPA figured the total savings for this year if the experiment was implemented. He said the change from 9 to 11 hours during the 6 week days saved \$2.4 million of electrical power, based on the first week of January. Subsequently, they have been looking at January to date, and it is still in the same range - that is, \$2.4 million of savings per month with an additional two hours of on peak generation.

Pam asked Clayton if there was any danger of not meeting the Federal contracted amounts of power.

Clayton said they had started to look for power on the market during the 4-hour block in mid December 2002. They found that since on peak usage is longer over the course of the day that people who own generation typically sell generation for a total of 12 or 16 hours in the day. People didn't want to sell WAPA any electricity at all for 4 hours because they would lose the opportunity of selling it for 16 hours. WAPA scrambled to find any power at all and eventually were able to find power if they were willing to pay for the full day rate. They bought power at approximately \$75-80 a megawatt hour which was about 2-3 times the usual rate. There is no chance they won't be able to meet this year's contractual obligations, it's just a matter of what they are willing to pay.

Mike asked Jeff to comment on GCMRC's reaction to the proposal.

Jeff said in his original memo to the TWG, they estimated there would be an export of sediment resources of approximately 3% more sand per week but unfortunately GCMRC only has 15% uncertainty in their models and so statistically that would be indistinguishable from export under

the current flows. They didn't have any concerns with the non-native fish suppression flows. They felt those would be comparable but there was a potential to have increased stranding of adult rainbow trout so they presented that prediction for consideration. An issue of larger concern for them was changing the flows in the middle of their 2-year experiment but to their best estimate they feel the impacts would be subtle.

Randy asked if this was a case where the program has to have 2 years of the same experiment and if it didn't - would it make a difference. He also questioned if they learned last year what they needed to learn about how trout respond under that one type of flow scenario in order to move forward with a more effective change.

Jeff said it would be desirable to have longer term experiments than the 2 years they proposed but they would also have the ability to compare data on the trout mortality in 2003 and in 2004. They would lose the opportunity for replication because theoretically the experiment was changed in the middle. Replication is a very important source of adding statistical power to their ability to discern those effects and so that one of their concerns.

Pam asked Jeff if the experiment should be continued for a time and then have it not connected for a period of time so the scientists could compare between the on-time and what a normal time would be.

Jeff said they are trying to block effects that can't be controlled so that they can determine an effect from the statistical treatment. In this case they're looking at the effects of the experiment on the experimental flows so they can conceivably extend the experimental design to include future years. However, the concern is that the experiment was designed to take place in a 2-year block and they lose the replication of having flows occur at the same rate in 2003 as they did in 2004. They're just making a very simple statistical test between those two years without having replication which adds the statistical power they need.

Bob asked why they wouldn't be gaining power if they had the additional power at 20,000 in a day.

Jeff answered that because they've changed the fundamental treatment, the flow rate, that's the treatment that they're looking at - the effect of mortality on trout. He reiterated that their best scientific judgment is that the effects would be subtle but there are effects that have to be considered.

Clayton said they had similar discussion at the TWG meeting and wanted to make it clear that WAPA supports a block design. They understand the nature of what GCMRC has proposed and believe that it is necessary to implement an experiment and compare it against an adequate baseline or set of other experiments to determine cause and effect. Clayton said that as a result of the MATA workshop, it wasn't clear to him that the 16-year experiment as originally proposed by GCMRC would remain in place for 16 years. He believes the 16-year experiment will be modified to change or to introduce experiments that stakeholders are interested in. One of the questions he proposed to GCMRC was that it has been WAPA's experience in studying the operations of Flaming Gorge Dam that hydrological conditions tend to overwhelm the effects

of operations and it seems to them that the block design should include fewer treatments and longer durations of those treatments. He asked if the non-native fish suppression experiment were to be a 5-year experiment rather than a 2-year experiment, would it make a difference in terms of Jeff's argument relative to statistical power.

Jeff said it would certainly be desirable to have a longer term experiment to pick up a signal and he doesn't disagree with Clayton that the experimental design might change in the future, particularly as the MATA results unfold. It's simply GCMRC's role to point out that when an experiment is in place and the design has been accepted, any modifications carry a risk associated with it and it's important for the AMWG to decide if the benefits outweigh the risks. From a strict scientific perspective, GCMRC doesn't recommend changing anything in the middle of a controlled experiment.

Bob said he couldn't understand why there was no analysis of the 20,000 cfs flow in the Biological Opinion or the Environmental Assessment associated with the 2-year experiment.

Jeff said they have very rigorous, empirical models on sediment transport and being a physical parameter, they're far easier to estimate. He said that 15% accuracy is pretty good in comparison with a biological system where one is looking at the trends. They're assuming that between 2003 and 2004 the flows would be comparable and that gives them the ability to have replication. He said that one can take a measurement of the treatment but you don't have the statistical confidence that you would by replicating and having 2 years worth of data.

Bob clarified his point that in the environmental document that analyzed the discrepancies, the duration of flows at 20,000 on a daily basis was not a parameter analyzed and quantified in the environmental assessment.

Jeff said that's a potential source of error which you have to estimate at any statistical analysis so that you understand what's the effect of the treatment and if you add on top of that, you only increase the error. That's why you get to the issue of losing the replication value. So you're right at changing on top of that only compounds that potential error.

Bob said that Jeff was missing his point that the environmental analysis done validates the experiment but the duration of 20,000 cfs is not consider a parameter – it was not analyzed at any of those values.

Jeff said he understood completely what Bob was saying and that if there is some variation between years related to that, then they would have to take that into consideration. If another component or variation were added on top of that with a modified flow between years, the error would be compounded.

Bill Persons said he agreed with Jeff that changing the treatment will make it harder to interpret the results. However, if the 2-year block design can be repeated and they can turn off the treatment for 2 years, turn it on for 2 years, etc., they should be able to sort out the results. He wasn't sure if changing the experiment is fatal but concurred that it's never a good idea to design an experiment and then change it in the middle.

Randy asked Jeff how the proposed adjustment to the winter flows would affect the trout recruitment - would it be about the same as last year or maybe a little bit more effective in reducing trout recruitment because of the lower Sunday flows.

Jeff said they figured that there might be a decrease in mortality with the increased flows during the weekday but they're making a best scientific judgment that because of the low flows on Sunday that would probably even out. He reiterated that GCMRC doesn't have a large body of data upon which they can give certainties.

Joe asked Jeff to talk more about the the sediment differential.

Jeff said they have sediment export models now for the river and can plug in the flow proposal that was tendered by Clayton through the TWG. They estimate that the flow modification would export approximately 3% more sand per week than a single week of currently scheduled flows but their models have an uncertainty rate of 15%. From a standpoint of statistics, that proposed increase is statistically indistinguishable from the sand export rates under the current flows.

Randy asked what other resources would be affected.

Jeff said his memo addressed impacts to the humpback chub and foodbase. He added that one potential benefit of having continued fluctuations is the continued flushing of food matter into drifts that may potentially benefit the trout fishermen.

Randy asked about the economic impacts.

Clayton said that since they're in a dry period and have contract commitments that are higher than the amount of generation, they are spending money to meet their contractual obligations. The experiment is not revenue enhancing. It will increase their costs on Sunday but the total estimated changes are saving just slightly over \$2 million a month. Clayton said that since they have about a 4-hour shortage in the morning, they made a proposal to modify the experiment by 2 hours and are making up the additional 2 hours by releasing water just for a few hours in the morning from the Aspinall Units, using up all the day's water in 2 or 3 hours out of the Blue Mesa Marble power plant. They are seeing a savings financially over what they would have spent of just slightly over \$2 million a month.

Pam said she assumed that there is still cost to do this experiment and asked if Clayton had an estimate of the magnitude of the cost.

Clayton said he had a memo from their Operations Office and so far they have spent \$5 million in January so with the month not quite over, he anticipates they will spend around \$6 million to meet their contractual obligations. Therefore, \$6 million in expenses and the change in the experiment would lower that amount by slightly over \$2 million. Thus, they've spent \$4 million to meet their contractual obligations per month rather than \$6 million.

Bill P. asked if there was a gain over doing ROD flows.

Clayton said that last year they thought there would be but that wasn't the case because of the way the pricing was structured. They spent so much money for firming power for the first the 4 hours of the on-peak time period that it overwhelmed the gain of having 20,000 cfs, a gain over the ROD. Clayton said with the experiment the way it was designed in the ROD and the current experiment, they're probably the same amount of dollars.

Bob said a real comparison would be with what happened last year and while nominally they are filling 2 hours, they are actually compensating for 4 hours, and WAPA is still back in the market trying to buy power. He added a real comparison would be what happened last year with what the next result is this year. (It was hard to understand Bob's question on the tape.)

Clayton said they did put together an estimate for last year but he didn't have that information available. He reaffirmed that the way the experiment is structured today, they will \$6 million in January and if they had had the change to that experiment occurring in January, it would be about \$2 million less.

Pam expressed concern that at the end of the experiment they may not be able to conclusively determine the specific impacts of the experiment and things like the mechanism or whatever results the group thought it may or may not be beneficial to HBC, the entire experiment may need to be repeated for 2 years and that might come with a cost.

Clayton concurred and said he wanted to make it clear that the current experiment was approved for 2 years even though GCMRC put forth a 16-year experiment. It's clear to him that it will probably be altered based on results from the MATA workshop so he was a little hesitant to say they're in a 2-year experiment because he wasn't sure that was the case.

Pam asked what was recommended to the Secretary and approved by her.

Clayton said the Secretary approved the 2-year experiment and what has not been approved by the Secretary or the AMWG is the 16-year block design. He said it is not Western's intent in making the proposal to alter the purpose of the non-native fish suppression flows. Furthermore, it is not their purpose to complicate or breach the scientific effort and so if GCMRC thought that this change in the experiment would devastate the scientific experiment that it intends, WAPA would drop the proposal.

Jeff said it's not their purpose to have a particular agenda with respect to which way the AMWG chooses to go but simply to point out that there is a cost associated with meddling in the middle of an experiment and the costs that may be incurred. There is a risk. It's probably a modest risk but it's a risk nonetheless.

Mike asked Norm what the TWG's position was WAPA's proposal.

Norm said that Clayton made a formal presentation to the TWG on January 8 and then Clayton forwarded the TWG's comments to the AMWG in a Dec. 10 e-mail message. There was a general recognition that changing the treatment in the middle of an experiment was not a good idea. Everyone recognizes that the proposal will be affected in some way, it just a matter of

whether it's significantly affected. A vote was taken at the TWG meeting (Yes = 11, No = 3, Abstaining = 1) but unfortunately that didn't represent a quorum (16 members), however, there were three members who expressed support for the proposal before leaving the meeting prior to the vote. There was no proxy provision in the TWG Operating Procedures so those votes were not accepted.

Pam asked Reclamation if the decision is made to go forward with the change, do they anticipate any actions under NEPA and what would they be

Dennis replied that the purpose of today's call is to determine resource impacts and level of public controversy. If the public controversy seems to be low and the resource impacts aren't identified by GCMRC, Reclamation would likely issue a press release. On the other extreme, they would do a supplement to the EA and have public notice and review.

Other concerns expressed by the participants:

- This year there is a downstream component and if there are sort of late winter early spring events on those tributaries, they could have an effect on the treatment down there. We also need to consider impacts on logistics (river trips) and when to study the redds. (Kaplinski)
- Importance of a public outreach program and getting information out to the public. (Persons)
- Consider releasing information via the GCD phone tree (similar to that invoked during the California blackouts) (Palmer)

Discussion on Remote Sensing. Jeff said he wanted to review what has happened in the past and provided some background information (**Attachment 4**). There was a failed mission in FY03 in which the contractor was unable to deliver on analog imagery that was taken in the canyon. GCMRC proposed at the last TWG meeting to use that money, about \$130,000, add it to the \$163,000 which was approved for airborne remote sensing, and move toward using state-of-the-art multi-spectral digital imagery. There was discussion at the TWG meeting about whether that was a reasonable thing to do. GCMRC maintained it was because they needed some level of discretion in their funding decision in order to accomplish the best science possible. However, that issue is now moot with regard to the availability of the sensor. Jeff said he would also like to talk about giving the GCMRC the discretion to put money where they can get the best science. He asked Phil to talk about remote sensing.

Phil said the 2-year remote sensing initiative included analog film data which used to be acquired every year but it wasn't really useful to the scientists, cooperators, or the general public. It was analog data and you had to go to the right spot. It wasn't on line and at best you could photocopy it. In comparison, the digital sensors can provide direct digital image data and can be rectified for topographic distortions quite easily so that the scientists can actually get accurate area volume, height measurements, and as well as surface feature identification. While it's been in existence for decades, it hasn't been used by GCMRC. It is more expensive than the analog approach but very little use of the old analog data was being made because it was often difficult to rectify or get a good measurement and very few of the scientists had enough knowledge to correct the data to use it. The digital sensors that GCMRC found useful would provide a high level of accuracy in their precision and in their feature identification but was more expensive.

They also found under the current climate conditions they wouldn't have to gather data every year. More people are using the data now, more uses are being made of the data, and better accuracies are being obtained. Phil reminded the AMWG that this information was presented to the TWG in October 2003 and there was a strong feeling that they should not do analog data collection. Unfortunately, the sensor that GCMRC found to be very useful in providing high levels of accuracy was removed from the USA and sent back to Germany and the Germans won't allow its use commercially. The sensor that can perform almost as well has to be obtained from a company in Canada and GCMRC feels the cost is acceptable.

Norm asked if the extra money would come from internal savings from already-budgeted AMP items or if it would come from an outside source.

Phil said the original money would be from a BOR request for remote sensing projects, \$1 million, and they have asked for concepts for the use of the money this year

Phil said the least they would fly this year would be for analog data and they would make it more orthorectified. It's not going to be \$84,000. That's an estimate. The rectification could be another \$100,000. But without that, the systemwide rapid analyses that have occurred in the last year or two could not be done with that data. There has been a lot of use of the data and it's online now. If they get additional funds and are allowed to go up to a higher quality data collection, could they go digital without discussing options every 2 years.

Phil said that digital cameras provide real time images. In the aircraft one can see exactly what is being gathered and stored and there is less likelihood for failure. Because of last year's failure, they may actually have to fly two aircrafts this year just to ensure the data is collected with the conventional system. In terms of monitoring, the digital cameras provide you three things:

- 1) The data are digital and are orthorectified and therefore you know where you are within 25 centimeters. In addition, they're calibrated so that over 300 miles of the canyon if you see something that features a plant, a piece of sediment of a certain color, you can rely on that color all the way down the river.

- 2) It can't vary because film canisters have different characteristics, the person who develops the film can change that, and then the scanning can change that but a digital camera does all of that instantaneously.

- 3) It also provides a larger dynamic range than film. Digital cameras store a range of thousands of values for a single surface element - for vegetation inventory, sediment analysis, mapping fish habitats along the shoreline of the entire river corridor, and mapping all of the beach areas. The analyses can be done in a matter of months.

Jeff said the larger issue and the decision point that's before the AMWG is GCMRC would like to request they have the discretion as the science and data provider in the adaptive management program to move toward with the new technology and use the funds from the failed mission in whatever way advances their ability to get on board with a biennial, multi-spectral, fully digital remote sensing initiative. They spent \$1.5 million over the last several years engaging Phil to evaluate all of these technologies. Phil made his presentation to the TWG in October and there is no reason to believe the TWG's recommendations have changed. Jeff said sensors will always get better and they will continue to adopt new technologies but feel strongly they need to move

away from this and need to have the discretion to make sure they are managing the science to the best capability possible. Jeff said they are proposing a biennial schedule and it would cost about \$150K - \$200K per year. He said the annual expenditure for just collecting the data is about \$85,000 but that data is not useful in that form. Useful data would be orthorectified and that's another \$100,000.

Joe said he would be interested in having a discussion with regard to how many flights, elevations, when, and all the sociological impacts.

Jeff responded with the following:

- the height of the flight is 8,000 feet and it would take 5-6 days to do the entire canyon.
- the camera would be mounted on a fixed wing
- they would like to do the overflight the weekend before the Memorial Day weekend.

Phil said there will be additional overflights using different sensors, lidar systems, one that measures terrestrial elevation to an accuracy close to the ground surveys and the second one that tests a lidar that can measure bathymetry down to 40 meters of water so they're hoping to test both of those. They fly very low down at 100 and 300 meters above the ground.

Leslie asked if the Center is prepared to do some monitoring this summer given the temperature and low water conditions to look at temperature impacts in light of getting TCD.

Jeff said they were already collecting temperature data as part of integrated downstream water quality program and will be presenting some of that information at the upcoming AMWG Meeting.

There was some confusion as to whether the AMWG members were going to do a vote on the conference call. Mike asked if there were any objections to WAPA's flow proposal. Hearing no objections, he said this would be discussed at the AMWG meeting and Reclamation would make a final decision on changing the flows.

Call concluded at: 11:21 a.m.

Respectfully submitted,

Linda Whetton
U.S. Bureau of Reclamation

General Key to Adaptive Management Program Acronyms

ADWR – Arizona Dept. of Water Resources	KA – Knowledge Assessment (workshop)
AF – Acre Feet	KAS – Kanab ambersnail (endangered native snail)
AGFD – Arizona Game and Fish Department	LCR – Little Colorado River
AGU – American Geophysical Union	LRRMCP – Lower Colorado River Multi-Species Conservation Program
AIF – Agenda Information Form	LTEP – Long Term Experimental Plan
AMP – Adaptive Management Program	MAF – Million Acre Feet
AMWG – Adaptive Management Work Group	MA – Management Action
AOP – Annual Operating Plan	MLFF – Modified Low Fluctuating Flow
BA – Biological Assessment	MO – Management Objective
BAHG – Budget Ad Hoc Group	MRP – Monitoring and Research Plan
BCOM – Biological Conservation Measure	NAAO – Native American Affairs Office
BE – Biological Evaluation	NAU – Northern Arizona University (Flagstaff, AZ)
BHBF – Beach/Habitat-Building Flow	NEPA – National Environmental Policy Act
BHMF – Beach/Habitat Maintenance Flow	NGS – National Geodetic Survey
BHTF – Beach/Habitat Test Flow	NHPA – National Historic Preservation Act
BIA – Bureau of Indian Affairs	NPS – National Park Service
BO – Biological Opinion	NRC – National Research Council
BOR – Bureau of Reclamation	NWS – National Weather Service
CAPA – Central Arizona Project Association	O&M – Operations & Maintenance (USBR funding)
GCT – Grand Canyon Trust	PA – Programmatic Agreement
CESU – Cooperative Ecosystems Studies Unit	PEP – Protocol Evaluation Panel
cfs – cubic feet per second	POAHG – Public Outreach Ad Hoc Group
CMINs – Core Monitoring Information Needs	Powerplant Capacity = 31,000 cfs
CRBC – Colorado River Board of California	PPT – PowerPoint (presentation)
CRAHG - Cultural Resources Ad Hoc Group	R&D – Research and Development
CRCN – Colorado River Commission of Nevada	Reclamation – United States Bureau of Reclamation
CRE – Colorado River Ecosystem	RBT – Rainbow Trout
CREDA – Colorado River Energy Distributors Assn.	RFP – Request For Proposals
CRSP – Colorado River Storage Project	RINs – Research Information Needs
CWCB – Colorado Water Conservation Board	ROD Flows – Record of Decision Flows
DBMS – Data Base Management System	RPA – Reasonable and Prudent Alternative
DFCAHG – Desired Future Conditions Ad Hoc Group	SA – Science Advisors
DOE – Department of Energy	Secretary – Secretary of the Interior
DOI – Department of the Interior	SCORE – State of the Colorado River Ecosystem
EA – Environmental Assessment	SHPO – State Historic Preservation Office(r)
EIS – Environmental Impact Statement	SOW – Scope of Work
ESA – Endangered Species Act	SPAHG – Strategic Plan Ad Hoc Group
FACA – Federal Advisory Committee Act	SPG – Science Planning Group
FEIS – Final Environmental Impact Statement	SSQs – Strategic Science Questions
FRN – Federal Register Notice	SWCA – Steven W. Carothers Associates
FWS – United States Fish & Wildlife Service	TCD – Temperature Control Device
FY – Fiscal Year (October 1 – September 30)	TCP – Traditional Cultural Property
GCD – Glen Canyon Dam	TES – Threatened and Endangered Species
GCT – Grand Canyon Trust	TWG – Technical Work Group
GCMRC – Grand Canyon Monitoring & Research Ctr.	UCRC – Upper Colorado River Commission
GCNP – Grand Canyon National Park	UDWR – Utah Division of Water Resources
GCNRA – Glen Canyon National Recreation Area	USBR – United States Bureau of Reclamation
GCPA – Grand Canyon Protection Act	USFWS – United States Fish & Wildlife Service
GLCA – Glen Canyon National Recreation Area	USGS – United States Geological Survey
GRCA – Grand Canyon National Park	WAPA – Western Area Power Administration
GCRG – Grand Canyon River Guides	WY – Water Year (a calendar year)
GCWC – Grand Canyon Wildlands Council	
GUI – Graphical User Interface	
HBC – Humpback Chub (endangered native fish)	
HMF – Habitat Maintenance Flow	
HPP – Historic Preservation Plan	
IEDA – Irrigation & Electrical Districts Assoc. of Arizona	
INs – Information Needs	
IT – Information Technology	

Q/A/C/R = Question/Answer/Comment/Response