

**TWG Chair
Report to the Secretary's Designee
and the Adaptive Management Work Group
Concerning the Results of a Technical Work Group Teleconference Call**

06 October 2006

The Technical Work Group (TWG) convened a teleconference call on Tuesday, 03 October 2006, from 9:00 AM- 10:51 AM (MST). The teleconference was established in response to a request from the Grand Canyon Monitoring and Research Center (GCMRC) for guidance on whether to include a recently submitted experimental option by Colorado River Energy Distributors Association (CREDA) with Experimental Options A-C, developed through the Science Planning Group (SPG) process, that are currently being evaluated by GCMRC. Based on an email and telephone poll of the TWG membership, a teleconference was determined to be the most favored method for considering and responding to GCMRC's request. This report documents the result of that TWG teleconference.

TWG stakeholder groups represented on the teleconference consisted of Arizona Game and Fish, Bureau of Indian Affairs, Bureau of Reclamation, CREDA, Federation of Fly Fishers, Grand Canyon National Park Service, Grand Canyon River Guides, Grand Canyon Trust, Hopi Tribe, Hualapai Tribe, Navajo Nation, State of Arizona, State of California, State of New Mexico, State of Utah, United States Fish and Wildlife Service, Upper Colorado River Commission, Utah Associated Municipal Power, and Western Area Power Administration. Also represented on the teleconference were Ms. Leslie James, CREDA, and Dr. John Hamill and Dr. Ted Melis of GCMRC. An ample number of TWG stakeholders were present during the teleconference to represent a quorum.

Three documents (see attached) were made available to the TWG stakeholders for reference prior to and during the teleconference. These documents consisted of 1) a letter from CREDA to GCMRC providing a narrative of their proposed experimental option, 2) a table outlining flow parameters proposed in the CREDA option, and 3) GCMRC's draft assessment of flow experimental options and estimated influence on downstream resources below Glen Canyon Dam between 2007 and 2016.

During the teleconference, Leslie James provided the TWG with a brief history of the development of the CREDA experimental option and a description of what was contained within that option, and a brief description of GCMRC's analysis of the options to date. The TWG discussed the CREDA option, the process for developing the 3 SPG options and whether the inclusion of the CREDA option was appropriate, and a need for a re-consideration of a previous option developed by the Grand Canyon Trust (identified as old Option 4 during the teleconference). Please note: that a more detailed account of the TWG discussions during this teleconference will be presented in the meeting minutes. As a result of this discussion, the TWG considered two motions (see below) and TWG action on each motion was accomplished by roll-call vote.

Motion 1: The TWG recommends that the CREDA option and old Option 4 be included in the analysis by GCMRC of the three options put forward by the SPG.

Voting Results:

No: 13

Yes: 6

Motion 2: Move that GCMRC be recommended to proceed in its evaluation of the CREDA option.

Voting Results: No: 8 Yes: 11

Without any subsequent objection by the Secretary’s Designee or the Adaptive Management Work Group, the results of the TWG vote on the two motions will be considered by GCMRC as direction from the Adaptive Management Program to incorporate the CREDA option in their analysis of the experimental flow options developed by the SPG.

This report is presented for your information. I would gladly provide any additional information, clarification, or answer questions regarding this report. Please contact me at 928/289/9259 or by email.

Humbly submitted,

Kurt Dongoske
TWG Chair



CREDA

Colorado River Energy Distributors Association

ARIZONA

Arizona Municipal Power Users Association

Arizona Power Authority

Arizona Power Pooling Association

Irrigation and Electrical Districts
Association

Navajo Tribal Utility Authority
(also New Mexico, Utah)

Salt River Project

COLORADO

Colorado Springs Utilities

Intermountain Rural Electric Association

Platte River Power Authority

Tri-State Generation & Transmission
Association, Inc.
(also Nebraska, Wyoming, New Mexico)

Yampa Valley Electric
Association, Inc.

NEVADA

Colorado River Commission
of Nevada

Silver State Power Association

NEW MEXICO

Farmington Electric Utility System

Los Alamos County

City of Truth or Consequences

UTAH

City of Provo

City of St. George

South Utah Valley Electric Service District

Utah Associated Municipal Power Systems

Utah Municipal Power Agency

WYOMING

Wyoming Municipal Power Agency

Leslie James

Executive Director

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September 26, 2006

VIA EMAIL ONLY

Mr. John Hamill
Chief, GCMRC

RE: Glen Canyon Dam Long-Term Experimental Options

Dear Mr. Hamill:

We appreciate the efforts your office continues to undertake in evaluating various Glen Canyon long-term experimental proposals. Shortly after the SPG meetings in June of this year, CREDA began assessing the various proposed options and has developed a slight variation on "SPG-A" for evaluation by your office and consideration by the TWG and AMWG. Following is a description of "A Variation", which you will see if very similar to SPG-A, differing only in certain ramp rates. The hydrographs associated with this A Variation will be transmitted directly to you by the Western Area Power Administration prior to the end of this week. The non-flow actions contained in A Variation are the same as those contained in SPG-A (which were described in the narrative write-up of SPG-A developed in January, 2006); the hydrology is the same as assumed for SPG-A, (transmitted to you by WAPA on July 20, 2006 – both SPGA-A and A Variation); the evaluation techniques and model (CRSS) should be the same as those used to evaluate the SPG proposals (A, B, C).

Attached hereto is a table outlining the flow parameters proposed in A Variation. We request that A Variation be evaluated alongside SPG-A, SPG-B and SPG-C and the results of such evaluation be presented in the final report provided to the peer reviewers, the TWG and the AMWG. We are also providing a copy of this letter and the attachment to Linda Whetton for distribution to the TWG and AMWG members, and to Mark Limbaugh as the Secretary's Designee for the Adaptive Management Program.

We would also like to assure you that CREDA is committed to working through the appropriate processes to develop a long-term experimental plan. We appreciate your evaluation of A Variation and look forward to continuing to work with the GCMRC in this important process.

Sincerely,

/s/ Leslie James

Leslie James
Executive Director

Cc: Mark Limbaugh – DOI
Brad Warren, WAPA
TWG and AMWG members
CREDA Board

“A Variation”
Proposed GCD Operating Criteria
9/26/06

Month	Max Daily Change (1,000 cfs)	Min Release (1,000 cfs)	Upramp (1,000 cfs)	Downramp (1,000 cfs)
October	8	5	4	3
November	8	5	4	4
December	12	5	4	4
January	12	5	4	4
February	10	5	4	4
March	8	5	4	4
April	6	5	4	3
May	6	7	4	3
June	8	7	4	3
July	10	7	4	3
August	10	7	4	3
September	8	7	4	3

DRAFT

**Assessment of Four Experimental
Options and Estimated Influence on
Downstream Resources below Glen
Canyon Dam Between 2007 and 2016**

October 13, 2006

**Prepared by the Grand Canyon Monitoring and Research
Center, in Cooperation with GCD-AMP Partners**

Flagstaff, AZ

Table 1.1 Comparison of BASE with four experimental options including flow and non-flow treatments, and ancillary projects.

	Flow/Non-Flow Treatment or Conservation Measure	BASE “Modified Low-Fluctuating Flows”	SPG Option A	Option A Variation	SPG Option B	SPG Option C
Flow	Increased Daily Stage Variation in Fluctuating Flows	No	Yes (increased by 50% to 66% in winter months and by 25% in summer months)	Yes (increased by 25% to 66% in all months except Apr & May)	No	Yes (increased by 50% to 66% in winter months)
Flow	Stable Flows	No	No	No	Yes, (tests of 4, 8 and 12 months)	Yes, (Sep. thru Oct.)
Flow	Beach/Habitat-Building Flows	Possible, but only under Hydrologic Triggers	Yes, as tests under sediment input triggering	Yes, as tests under sediment input triggering	Yes, as tests under sediment input triggering	Yes, as tests under sediment input triggering
Flow	Alternative Ramping Rates	No	Yes (hourly down ramping rate increased 100% in all months)	Yes (hourly down ramping rate increased 100% in Apr-Oct & 167% in Nov-Mar)	No	Yes (hourly down ramping rate increased by 100% in Nov-Jul only)
Non-Flow	TCD	No	Yes	Yes	Yes	Yes, 2-units assumed
Non-Flow	Control of Coldwater Fish	No	Yes, as needed	Yes, as needed	Yes, as needed	Yes
Non-Flow	Control of Exotic Warmwater Fish	No	Yes, as needed, with R&D starting in 2007	Yes, as needed, with R&D starting in 2007	Yes, as needed, with R&D starting in 2007	Yes, with R&D starting 2007
Non-Flow	Disease/Parasite Research	No	Yes	Yes	Yes	Yes, with R&D starting 2008
Non-Flow	Humpback Chub Translocation	No	Yes	Yes	No	¹ Yes
Non-Flow	HBC Refuge(s)	No	Yes	Yes	Possibly	¹ Yes
Non-Flow	HBC Population Augmentation	No	Yes, Planning efforts toward implementation, as needed	Yes, Planning efforts toward implementation, as needed	No	¹ Yes, planning phase
Flow & Non-Flow	² Mini Experiments	No	Yes	Yes	Yes	¹ Yes
EXP	Design	Not applicable	Reverse Titration	Reverse Titration	Factorial	Forward Titration

NOTE: 1) For SPG Option C: Ancillary projects not considered part of the main experiment; implementation decision includes consideration of confounding the main experiment. 2) Mini-experiments are short-term field experiments that do not confound main experimental treatment effects. For SPG Option C: These experiments are considered undefined concepts and would be incorporated if defined and not in conflict with the main experiment.

Section II

Descriptions of Experimental Options

Title - **Option A Variation**

Goal - (SAME AS SPG OPTION A) The purpose of the Option A Variation experimental approach is first and foremost to provide a set of benefits to a variety of resources including the:

- Grand Canyon population of the humpback chub (*Gila cypha*);
- Sediment resources (conservation) in the Grand Canyon critical reach over the long-term;
- Aquatic food base;
- Value of the power resource; and
- Lees Ferry trout fishery.

Although all of these resources are expected to benefit from the proposed integrated program, the primary focus is on the humpback chub. The Option A Variation experimental program capitalizes on the information gathered to date on the status and trajectory of the humpback chub population, flows thought to benefit that population and the resources on which it depends, and non-flow management actions that would be effective in controlling nonnative predators and competitors of chub. The timing and sequence of flow and non-flow treatments implemented under the approach associated with Option A Variation is shown in Table 2.4.

Table 2.4 Experimental program elements under Option A Variation from 2007 to 2016, with prior treatments shown for 1998 through 2006¹. (SAME AS SPG OPTION A)

Water Year	Dominant Dam Operation	Mechanical Removal	Temperature Control Device (TCD)	Beach/Habitat Building Flow	Humpback Chub Comprehensive Plan Research	Humpback Chub Comprehensive Plan Habitat
1998	MLFF with habitat maintenance flow	No removal	No TCD	No BHBF	No activities	No activities
1999	MLFF only	No removal	No TCD	No BHBF	No activities	No activities
2000	MLFF with low summer steady flows and habitat maintenance flow	No removal	No TCD	No BHBF	No activities	No activities
2001	MLFF only	No removal	No TCD	No BHBF	No activities	No activities
2002	Same as previous	No removal	No TCD	No BHBF	No activities	No activities
2003	MLFF with experimental fluctuating flows	Trout removal	No TCD	No BHBF	No activities	No activities
2004	Same as previous	Same as previous	No TCD	No BHBF	No activities	No activities
2005	MLFF with experimental fluctuating flows and fall testing	Same as previous	No TCD	Fall BHBF	No activities	No activities
2006	Modified MLFF [see text for description] ²	Trout and possibly warmwater species removal ³	Complete Draft EIS/BO	Fall BHBF dependent on sediment input from Paria and Little Colorado Rivers	Research and development of augmentation approach	Expansion of humpback chub habitat (e.g., translocation to Colorado River tributaries)
2007	Same as previous	Same as previous	Complete FEIS/BO	Same as previous	Same as previous	Same as previous
2008	Same as previous	Same as previous	Initiate construction	Same as previous	Same as previous	Same as previous
2009	Same as previous	Same as previous	Continue construction	Same as previous	Continue research or begin implementation if appropriate	Same as previous
2010	Same as previous	Same as previous	TCD operations	Same as previous	Same as previous	Same as previous
2011-2016	Same as previous	Same as previous	Same as previous	Same as previous	Same as previous	Same as previous

- ¹ Orange indicates element not implemented, green indicates element is implemented during a particular year. MLFF = modified low fluctuating flow alternative, BHBF = beach/habitat building flow.
- ² Modifications relative to ROD flows include lower minimum flows during weekdays, but relatively higher minimum flows on Sundays with flows never dropping as low as ROD flows on Sundays; faster downramp rates; and experimentation with summer stranding flows and fall flows.
- ³ Adaptively managed to be shifted to control of warm-water nonnative species as necessary.

Elements of the Proposed Option A Variation Flow Regime - Under the Option A Variation experimental proposal the Daily Stage Variation (DSV) associated with diurnal fluctuations would also be greatest in December and January with a 50% increase in the DSV compared with the BASE (12,000 vs. 8,000 cfs range). There would also be an increase in the DSV of 66% compared with the BASE in February (10,000 vs. 6,000 cfs range). Additionally, there would be 25% increase in the DSV in Sep-Nov and in Mar and Jun (8,000 vs. 6,000 cfs range), as well as a 25% increase in the DSV in July and August (10,000 vs. 8,000 cfs range). The DSV would remain unchanged relative to the BASE only in Apr-May (6,000 cfs range). The hourly upramping rate would remain unchanged at 4,000 cfs/hr. under Option A Variation, but the hourly downramping rate would be increased by 100% in Apr-Oct (3,000 vs. 1,500 cfs/hr) and by 167% in Nov-Mar (4,000 vs. 1,500 cfs/hr) compared to the BASE.

Additional Flow Experiments (SAME AS SPG OPTION A)- In addition to the proposed daily, weekly, and annual pattern described above, the proposed Option A Variation experimental flow regime would include a number of other experiments. Included are nonnative fish management flows (e.g., summer stranding flows), fall steady flows to benefit young humpback chub, and tests of the effects of ramp rate on sediment transport. Mini-experiments related to these flow elements would be subject to adaptive management, but would at minimum include: 1) **Summer Stranding Flows** (intended to disadvantage nonnative fish), 2) **Fall Flows** (that could be ecologically steady to advantage young-of-year native fish in the main channel), 3) **Ponding Flows** (relatively high flows that produce slackwater areas in tributary mouths for benefit to juvenile native fish) and 4) **Electrical Power Production Experiments** (intended to investigate alternative fluctuating flow parameters that might be compatible with downstream resource objectives.).

Non Flow Measures/Treatments (SAME AS SPG OPTION A) – In addition, Option A Variation includes several non-flow components intended to provide benefit to downstream resources, particularly humpback chub: 1) **Temperature Control Device** (construction and testing of such a device with as many units as are needed to achieve desired downstream water temperatures to improve the survival of larval and juvenile humpback chub), 2) **Continued Efforts toward Humpback Chub Augmentation** (planning and research of artificial stocking program, as well as research on developing a program of grow-out ponds at the mouths of the Little Colorado and Paria Rivers), 3) **Efforts to Increase the Geographical Extent of Occupied Humpback Chub Habitat in the Colorado River Ecosystem** (with translocation efforts focused on other priority tributaries, such as Bright Angel and Shinumo Creeks, plus other possible side streams that are suitable) and 4) **Mechanical Removal of Nonnative Fishes** (including both cold and warmwater exotic species, as needed).

Experimental Design (SAME AS SPG OPTION A) – The primary goal of Option A Variation is to implement as many treatments as possible that proponents believe will benefit downstream resources and do so as soon as feasible. These efforts are particularly focused on humpback chub, but also include consideration of many other ecosystem resources. The Option A Variation approach is referred to as a Reverse Titration, meaning that all treatments are implemented to achieve resource benefit until such time that positive responses in targeted resources is detected. Then, following ongoing monitoring and assessment, treatments may be systematically removed one at a time under continued monitoring until benefits are observed to diminish (learning by undoing). Although learning through this process may be more complicated, proponents believe that the potential for beneficial resource response is a priority above establishing cause-effect science results.

