MEETING NOTES

SOUTH CAROLINA ELECTRIC & GAS COMPANY
SALUDA HYDRO PROJECT RELICENSING
WATER QUALITY TWC

SCE&G-Carolina Research Park
May 22, 2007

Final ACG 6-29-07

ATTENDEES:

Alison Guth, Kleinschmidt Associates
Bill Argentieri, SCE&G
Dan Tufford, USC
Roger Hall, SCDHEC
Shane Boring, Kleinschmidt Associates
Amanda Hill, USFWS
Andy Sawyer, REMI
Reed Bull, Midlands Striper Club
Ron Ahle, SCDNR
Jim Ruane, REMI
Tom Bowles, SCE&G
Amy Bennett, SCDHEC
Randy Mahan, SCANA Services
Gerrit Jobsis, American Rivers

DATE: May 22, 2007

DATE OF NEXT MEETING: **August 7th, 2007**

INTRODUCTIONS AND DISCUSSION

The group began the meeting and brief introductions ensued. The purpose of the meeting was for Jim Ruane and Andy Sawyer to present their findings on the Ce Qual W2 model applications to examine the effects of operations on fish habitat in Lake Murray. These were determined in the previous Water Quality TWC meeting. Jim briefly reviewed what had taken place during the previous meeting with the group, and noted that there were several issues identified during that meeting. These items included: striped bass kills, blueback herring entrainment, habitat for fish species, and impacts to the tailwater fishery due to operational changes. As discussed in the previous meeting, Jim noted that the preliminary findings indicated that the primary cause for fish kills was shown to be high flows. Meeting discussions were supplemented with graphs that are depicted in the following PowerPoint presentation (http://www.saludahydrorelicense.com/documents/MicrosoftPowerPoint-May22-2007meetingreservoiroperationAnalysis.pdf). Andy also displayed a excel spreadsheet that depicted the monthly flows for several years. The spreadsheet cells were colored in blue if it was a high flow month, yellow if it was a low flow month and green if it was an average flow month. Fish kill months were colored in red. The special operation years of 2002 and 2004 were left off the illustration. Bill Argentieri asked if anything stood out to Jim or Andy in this illustration. Jim replied that primarily the year 1998 stood out. He explained that there were high flows from January through May. Jim also noted that 1993, also had several months of high flows early in the year. Ron Ahle observed that the chart indicates that it may almost have to be a drought situation

for there not to be a fish kill. Dan Tufford asked the group if the fish will migrate toward the water surface during the late summer months to find habitat. Gerrit Jobsis noted that he has observed that the fish will come to the surface after a cool rain event.

Jim and Andy then began to discuss the new operational constraints that were considered after the previous meeting discussions. Jim noted that they had evaluated the raised pool levels with the following considerations and assumptions:

Scenarios considered
- 354 (Jan 1) to 358 (May 1 through Sept 1) to 354 (Dec 31)
- 350 (Jan 1) to 358 (May 1 through Sept 1) to 350 (Dec 31)

Assumptions
- Assumed 500 cfs for minimum release
- Assumed reserve generation averaged 3 hrs every two weeks at 18000 cfs
- Balance of releases were assumed to be used to supplement system demand

Approach
- The above scenarios were developed by KA using daily average flows using HEC Res Sim
- CE Qual W2 was run using daily average flows and release flows were adjusted so that target pool levels were attained
- Using the daily average flows that were adjusted using the w2 model the hourly flows for each day were developed using the assumptions above

Andy then began to explain the scenarios to the group. He noted that when Unit 5 was run first on, last off, the model depicted that it either helped retain habitat, or did nothing. Andy also presented the group with an animation showing that running unit five first significantly preserved the cooler water for a longer period of time. Bill noted that although the habitat loss is delayed under this scenario, he asked if this scenario would only just serve to delay a fish kill. Ron replied that with delaying the habitat loss, they are increasing the potential for recovery. Dan Tufford asked if the animations could be placed on the relicensing website and Alison Guth noted that she would work with Andy to figure out the best way to do this.

The group also reviewed charts depicting the temperature changes in the tailrace during the unit 5 first on-last off scenario. Andy explained that it can be expected that there will be a warmer discharge by discharging out of unit 5. It was shown that there was a one to two degree difference during some times of the year. Andy also showed what the modeled difference in DO in the tailrace would be during this mode of operation. It was shown that there was not quite as big a difference with DO and in some cases the DO in the tailrace was improved by using unit 5 first. Ron noted that it would probably not be good to run Unit 5 first from August through September due to the cool water fishery downstream. Gerrit agreed and pointed out that the biggest jumps in temperature

downstream generally were depicted to be around September 15th , when they are past the crunch time in the lake. Ron also suggested using the discharge temperatures as an indicator for a switch in operation scenario. Andy asked if there was a specific temperature that would trigger a switch in mode of operations. Gerrit noted that it would be a temperature that allows the trout to remain healthy. Shane added that temperatures should probably stay below 17 to 18 degrees C. Ron noted that it would be important to determine at what release temperature would an appropriate temperature be provided for all the way downstream. The group also reviewed temperatures in front of unit 5 during alternative operation scenarios. The model showed that the temperature was cooler in front of unit 5 when it was used first on - last off.

Jim then reviewed what the next steps would be. Jim noted that one of the benefits of drawing down the pool level is it scours out the sediment buildup in the coves, particularly near the inflow areas. Jim continued to explain that most reservoirs do not have an issue with internal nutrient cycling, but the Little Saluda River embayment does have quite a bit of internal nutrient cycling, and thus not drawing the lake down could have a negative effect on water quality. The group discussed that there was quite a bit of information available that pointed to where most of the nutrient input was coming from. The group discussed DHEC criteria for nutrients and that it would take public outreach to help the nutrient situation in the lake. There was some dialogue on a TMDL, and Shane reminded the group that they had previously discussed a TMDL and it had been decided that it was outside the relicensing process, as there had to be an initiative from DHEC to begin establishing a TMDL. However, the group decided to focus on what they could do with respect to Project operation to improve water quality. The model had shown that water quality could be slightly improved with a higher pool elevation and the preferential use of Unit 5. Ron noted that before any changes were made in operation in 2007, however, the group should complete the next steps of the model.

Next Steps included:

1. For selected years, finalize assessment (i.e., assess changes in releases) of operating guide for U5 preference for “first on, last off” operation using the hourly releases

2. For selected years, finalize assessment of maintaining summer pool levels at 358

3. For selected years, finalize assessment of the combination of maintaining summer pool levels at 358 with U5 preference for “first on, last off” operation using the hourly releases

4. Analyze additional years, especially a low flow year

5. Assess effects of minimum winter pool level, including effects on Little Saluda embayment, increased SOD, internal nutrient cycling, aquatic plants, sedimentation in coves,

The group concluded and decided that Jim and Andy would work on the next steps of the analysis before any operational changes were made. The next meeting will be held on August 7th, 2007, and Jim and Andy will attend in person to present their findings to the group. The group will then begin discussing recommendations.

Group Adjourned