RIVANNA WATER & SEWER AUTHORITY
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November 11, 2011

Mr. Peter Kube
Chief, Western Virginia Regulatory Section
United States Army Corps of Engineers
Fort Norfolk, 803 Front Street
Norfolk, Virginia 23510

Re: Corps of Engineers Permit No. 06-V1574, Expanded Ragged Mountain Reservoir and Pipeline Project

SENT BY E-MAIL AND CERTIFIED MAIL

Dear Mr. Kube:

Thank you for your letter of October 26, 2011, setting forth some questions about the Expanded Ragged Mountain Reservoir and Pipeline Project. Because the project management at the Corps and Virginia Department of Environmental Quality has turned over since this project application was evaluated and the permit was issued, we are understanding that you have some questions. Our aim is to answer them as completely as reasonably possible and to make sure you understand the situation fully, so we are pleased to receive and respond to your inquiry.

A Smaller Dam?

Your first question asked what the difference in impacts to waters of the United States would be if the reservoir were built to supply a system yield of approximately 17 mgd rather than the currently permitted system yield of 18.7 mgd. There would be no difference in impacts to wetlands, because all of the wetlands affected by the current reservoir would also be inundated or filled by a 17 mgd project. Thus, there would be no difference in impacts to special aquatic sites. There also would be no difference in linear feet of streams filled, because both dams would occupy the same footprint. With respect to inundation of stream segments located upstream from the dam, the current, earth-fill reservoir will affect 11,511 linear feet. Because we do not know exactly what pool elevation would be required for a hypothetical reservoir to provide a system yield of 17 mgd after satisfying target minimum instream flows, we cannot give you an exact answer. However, we do know that the first phase of the current reservoir, which would provide a long-term system yield of 15.3 mgd, would result in inundation of 8,756 linear feet of stream segments upstream from the dam. Interpolating linearly suggests that a project producing a 17 mgd system yield would inundate approximately 10,133 linear feet of stream above the dam. This is a difference of about 1,378 linear feet.

To place these figures in perspective, it is appropriate to remember that the Corps determined that the original, roller-compacted concrete dam providing a system safe yield of 18.7 mgd would – in its entirety – have "no significant impact." [Corps, "Final Environmental Assessment" (May 8, 2008) at page 8] That determination was based on 2.61 acres of wetland impacts, and a total of 13,565 linear

feet of stream impacts (including 12,761 linear feet located above the dam). All of the stream segments that would not be affected by a hypothetical 17 mgd reservoir but would be affected by the current earth-fill dam are located above the existing Ragged Mountain dams. As the Corps has previously noted, they therefore "are ecologically disconnected from the downstream system" at present (Id. at page 4). They also have been determined by the Corps to be fully offset by the approved mitigation plan.

You have asked what justification there is for incurring these additional linear feet of stream impacts that have already been determined by the Corps to be not significant. Our first answer is that the additional 1.7 mgd yield may be needed fifty years from now. Several demand studies have been performed within the past 12 years, each projecting a need fifty years in the future in a range between 17 and 21 mgd. Given the uncertainty of demand projections, we have no basis to assume that the 17 mgd projection will prove in fifty years to be more accurate than the others. The fact is that a difference of 1.7 mgd fifty years in the future is within the margins of error of these studies. Gregory Bateson defined information as "a difference that makes a difference." In that sense, the latest demand analysis by AECOM is not new information that is either material or substantial in nature. Our project purpose remains ensuring that area water needs are met throughout the next fifty years. We continue to believe that planning for an 18.7 mgd system yield is prudent and appropriate, and it remains our project purpose. Further, we are proposing to build the reservoir expansion in two phases while agreeing to perform all of the approved mitigation in the first phase. This defers some of the stream inundation until the need approaches.

Our second answer is that having to delay, re-engineer and redesign, and obtain revised government authorizations for a different project would involve risks and significant expenses that are out of all proportion to the potential difference in environmental effects already determined by the Corps to be not significant. In addition to meeting area water needs, this project is intended to cure dam safety issues as mandated by the Virginia Department of Conservation and Recreation. RWSA has been ordered to award a contract for construction of those corrective measures by December 31, 2011, but could not do so if the project had to be revised. Hundreds of thousands of dollars of additional expense would also be required for insignificant, if any, benefit.

Dredging?

You have asked us to discuss whether dredging South Fork Rivanna Reservoir may be part of "a viable option" to meet our area's water need. It is not, and we know of no credible new information which suggests that it might be.

When Gannett Fleming evaluated dredging in 2004, it concluded that at most dredging could increase system safe yield fifty years in the future from the present safe yield by 1.5 mgd – and could only do that if dredging was repeated as needed throughout the period to maintain a total useable reservoir storage capacity of 1,100 million gallons. Further, Gannett Fleming's estimate of added safe yield by dredging was based on maintaining the practice of stream flow releases RWSA voluntarily practiced in 2004. Gannett concluded that approximately 5 million cubic yards of sediment would have to be removed over that period, at a cost between $25.50 and $29.00 per cubic yard (depending on one's assumptions with respect to possible marketability of dredged material). [Gannett Fleming, "Concept Development – Dredging the South Fork Rivanna Reservoir" (December 1, 2004), at pages 12 through 14] On that basis, the Corps determined that dredging was not "practicable" because its costs were out of all proportion to the costs of other options. Further, dredging does not provide environmental advantages over the Expanded Ragged Mountain Reservoir and Pipeline. As an

example, the issued Corps permit for the expanded Ragged Mountain Reservoir requires further augmentation of ecological stream flows compared to RWSA's prior voluntary practice referenced above. In July 2011 at the request of the Virginia Department of Environmental Quality, RWSA's hydrologic modeling consultant simulated providing this same augmentation in a scenario where repeated dredging the South Fork Reservoir was the only means of expanding the water supply. The conclusion was that such a scenario would only provide a long-term system safe yield of 10.3 mgd. Because the existing system safe yield with the voluntary flow releases is greater at 12.8 mgd, this means that dredging alone does not provide sufficient additional storage to augment the stream flows as required by the present Corps permit even if no safe yield were added to the water supply.

The 2010 report by HDR Engineering, Inc., which your letter referenced, evaluated the one-time dredging of South Fork Rivanna Reservoir to remove 1,126,010 cubic yards of sediment. Although HDR did not calculate the effect on system safe yield fifty years in the future, any increase obviously would be a small fraction of what Gannett Fleming evaluated in 2004. That is because HDR's study only considered removing one-quarter of the 5 million cubic yards that Gannett Fleming estimated was either already in the reservoir, or will be washed into it over the next fifty years. In any event, HDR estimated the cost of removing that 1,126,010 cubic yards at $26.00 to $27.30 per cubic yard (depending on one's assumptions regarding the marketability of dredged material). This is within the same cost range determined by Gannett Fleming in 2004, and upon which the Corps found dredging to be impracticable. The 2010 HDR study confirms – and does not contradict – the Corps' prior determination.

Again, we know of no reliable information to the contrary. RWSA has agreed to issue a request for proposals to accommodate those who wish to see what responses are received. The budget established by the RWSA Board is $3.5 million, which based on HDR's estimates would only remove 290,000 cubic yards of predominantly sandy material, representing 59 million gallons of restored water volume, or only 3% of the added water volume Gannett Fleming determined was needed to supply a safe yield of 18.7 mgd.

Route 29 Distribution Upgrade

Your letter refers to a pipeline along U.S. Route 29, "which would link the South Fork and North Fork distribution systems by completion of a transmission main. . . ." As you may realize, this is not a means of augmenting the area's water supply. It cannot by itself supply any additional water. Thus, it is not a water supply "alternative" at all. Rather, it is a means of assuring that whatever water is available to the system can get to where it needs to go in the treated water distribution system in order to meet anticipated demands throughout the system.

It may help you further to know that all of the alternatives in the permit support documents on which the Corps permit determination was based included this cure to the treated water distribution system "bottleneck" in order to minimize the additional storage required to reach the target safe yield. That is to say, all of the water supply alternatives evaluated assumed that the U.S. Route 29 distribution system pipeline would be constructed. [Gannett Fleming "Safe Yield Study" (January 2004) at page 47] While the agency project managers at the time the permit was issued for the Expanded Ragged Mountain Reservoir and Pipeline understood this, such knowledge may have been lost with personnel turnover.

Summary and Conclusion

To summarize, there would be little or no environmental benefit to building a reservoir producing a 17 mgd system yield rather than the current proposal. However, doing so would result in substantially delaying needed dam safety improvements and significantly increased costs. It may also deny the area water it will need in fifty years. Dredging remains impracticable to provide the area's future water supply for the same reason cited by the Corps in its permit determination. The 2010 HDR report confirms this. Finally, the distribution system improvement about which you inquired was fully considered by the Corps as a necessary upgrade, and was "built into" all of the water supply alternatives evaluated.

RWSA has been proceeding in reliance on its existing permit and has expended considerable time and resources in that effort. We welcome the opportunity to answer your questions as this community deserves a future water supply based on solid and reliable information and sound analysis. Thank you for your efforts toward that goal.

Sincerely,

Thomas L. Frederick, PE
Executive Director

cc: RWSA Board of Directors
Mr. William Ellis, Esq.
Mr. Scott Kudlas
Mr. Vincent Pero
Ms. Jennifer Whitaker
Dr. Robert Wichser

RWSA File – USACE – Permit No. 06-V1574 for Ragged Mountain Dam
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