

Summary of Findings of ITRT

Prepared by RWSA from April 8, 2009 ITRT Report

- Next step is to decide who will continue the design of the Dam.
- Design decision required and some additional geotechnical investigation before a dependable updated cost estimate can be developed.
- Except for the “high budget estimate” issue in August 2008, design work to-date by Gannett Fleming appeared to be proceeding in a satisfactory manner.
- A decision on the number of prime construction contracts should follow some additional design work and be based on how best to manage the risks of uncertain subsurface conditions for foundation.
- ITRT recommends an engineering geologist and a dam designer on site during the construction foundation preparation phase. The design plans should then be a best estimate of excavation elevation; contract documents should be flexible enough to allow for adjustments with contingency for unit price adjustments.
- Other alternatives for the dam’s upstream face should be evaluated and compared to the current Gannett Fleming approach of precast concrete panels with a geosynthetic liner. ITRT believes alternatives may exist to provide the same performance at a lower cost.
- The RCC mix design has not yet been determined through design and is a very important early step to re-starting design. Selection of the borrow source is critical to this step. The ITRT recommends further exploration of on-site aggregate sources and considers using Reservoir Road for aggregate hauling (as well as other construction use) a very significant concern. The ITRT also recommends addressing the potential impacts to Camp Holiday Trails.
- The ITRT believes the dam can be founded on a shallower foundation than proposed by Gannett Fleming with substantial capital cost savings from the August 2008 estimate. The ITRT suggests the foundation be on bedrock located beneath the soil and “weathered bedrock that can be removed with earth moving equipment”, with “little impact” on safety and performance, with RWSA accepting “some seepage”. A variety of excavation equipment and pre-qualified grouting specialists using excellent specifications will be necessary. The ITRT recommends a grout curtain installed by a specialty contractor for seepage control, and recommends some jet grouting be considered for deeply weathered areas, but recognizing some rock mass fissures may not respond to jet grouting, they recommend critical gradient analysis to define erosion potential.
- Minor adjustments to currently proposed dam alignment should be considered in the interest of cost, particularly on left abutment, after being checked by further subsurface investigations. The ITRT discussed the location of the existing lower dam during the workshop, including the review of some historical documents that described problems with the existing dam structure; they did not recommend the current lower dam location and alignment be explored.
- The ITRT recommended a significantly different design approach to further field investigations, focused on field mapping and geological determination (identify the persistence and location of weathered bedrock conditions between borings) by

an experienced geologist, rather than additional borings and geophysics testing that had been proposed by Gannett Fleming. The ITRT's recommended investigations include: (1) field mapping and geological determination (identify the persistence and location of weathered bedrock conditions between borings) by an experienced geologist; (2) upper rock core classification by the Rock Mass Rating method in addition to the ASCE rating used by Gannett Fleming; (3) expanded test pits using a large backhoe at locations described in table on Page 7 of the report; and (4) perform linear analysis of geologic structures from Remote Imaging data sets. The ITRT is not convinced that additional borings or geophysical work proposed by Gannett Fleming is necessary, but leaves open the possibility to reconsider such tests after the geologic mapping is completed.

- The ITRT recommends the preliminary “wing” cutoff concept for the abutments of the proposed new dam be abandoned, a concept Gannett Fleming estimated in August 2008 to add substantially to the project cost. The ITRT recommends the consideration of appropriate “spot treatment” excavation, and drilling and grouting for treatment of potential seepage induced erosion. While the ITRT does not believe it appropriate to offer alternative costs estimates at this point in their understanding of the project, the ITRT discussion with RWSA staff during the workshop did suggest this change to abutment design could shave several million dollars off Gannett Fleming’s “high cost estimate”.
- With respect to the I-64 embankment, the ITRT believes it may be valuable to compare roadway design grades with current grades to understand how much settlement of the embankment has already occurred since the roadway was built. The ITRT agrees that current analysis by Gannett Fleming shows the roadway fill will perform well with the new reservoir under 100-year flood conditions, leading to question why significant and costly “mitigation” is really necessary.
- The ITRT agrees with Gannett Fleming that much less expensive options should be considered in lieu of a very expensive new culvert to provide “visual inspection” for VDOT without sacrificing important performance criteria. This could result in substantial project cost savings.
- The ITRT recommends the design of I-64 embankment issues be separated from dam design, and a firm hired who has substantial experience with VDOT.
- The ITRT recommends that the extent to which lake lowering can be performed during construction (without risk to failure of water supply) be considered.
- The ITRT suggests that under the current circumstances new dam completion cannot occur by June 2011 and late 2012 to early 2013 is more realistic. The development of a permit schedule is also recommended.