

### 3. GEOTECHNICAL STABILITY ANALYSES

In 1998, Geosyntec evaluated the stability of the Dam under static and seismic conditions. As part of the scope of work, Geosyntec conducted a subsurface investigation, installed dam safety instrumentation, and completed a laboratory testing program on soil samples of the Dam for strength and material characterization. Using the results of the field and laboratory investigation activities, Geosyntec developed a seepage and slope stability model of the Dam to evaluate its performance under normal and seismic loading conditions. The calculated slope stability factors of safety met the requirements of the GA SDP for the global steady-state and pseudostatic scenarios.

The 1998 report was submitted to and reviewed by the GA SDP. Additionally, Geosyntec provided Big Canoe POA and GA EPD a White Paper in 1999 and Response to Comments in 2002, which further detailed the slope stability and seismic analyses conducted. However, these documents were never formally accepted as the calculation of record. Accordingly, Geosyntec prepared updated Stability Analyses of Lake Petit Dam (Package) and attached it herein as **Appendix A** for GA SDP review and approval.

The purpose of this Package is to document an updated evaluation of the stability of the Dam under the loading conditions required by the Rules and Regulations of the State of Georgia, Rule 391-3-8-.09 for earthen embankments. Specifically, this Package documents an evaluation of the calculated factor of safety against instability for static and pseudostatic loading with steady-state seepage conditions, as well as rapid drawdown analysis. Existing soil laboratory data and subsurface investigations were reviewed and judged to be sufficient for analysis. No significant data gaps were identified which warranted additional subsurface investigations.

The GA SDP's rules also reference the rapid drawdown case for a submerged downstream toe. This analysis was not included in this Package because the toe of the Dam is not submerged nor is it expected to become submerged during the design flood. During a flood event or discharge of the reservoir through the Spillway, it is unlikely the downstream side of the Dam will become inundated due to the discharge point location and local topographic relief downstream of the Dam. The Dam's spillway discharges into an impact basin, then into Petit Creek at approximately Elevation (El.) 1,514 ft and approximately 250 ft downstream of the impact basin. The ballfields across the street from the toe of the dam are at approximately El. 1,530 ft. The next controlled level downstream is Lake Sconti Dam, which is approximately one mile downstream and has an embankment top elevation and normal pool at approximately El. 1,470 ft and 1,464 ft, respectively. The GA SDP's rules also reference the end of construction case for stability following completion of dam construction. Stability of the Dam at the end of construction was not evaluated, as this dam has been constructed and in service for approximately 50 years.