study area and collected bulk sand samples from ground surface to 50 feet bgs, which represents the proposed mining impact depth. The bulk sand samples from 0 to 50 feet bgs sands were drummed by individual boring location and transported to Minerals Technologies in Stark, Florida to process the material in the same manner as the proposed mining extraction process (i.e. extraction of the humate, clays, and heavy minerals). The post-processed sands (minus humate, clays, and heavy minerals) were drummed by individual boring location and delivered to TTL for permeability testing. TTL then performed permeability testing of remolded samples with various percent mixtures of bentonite.

15. A pumping test was performed at a location near the crest of Trail Ridge and in the central portion of the proposed mine area. A total of 11 observation wells (eight shallow and three deep) were installed for the pumping test. In addition, one large diameter pumping well was drilled and installed to the top of the Hawthorn Formation (a depth of 115 feet bgs). The pumping test was conducted as a step test with 24 hours of pumping with the final rate of pumping set at 120 gallons per minute (GPM). HGC analyzed the data from the from pumping and observation wells separately, and by considering pairs of observation wells to provide estimates of transmissivity (T) and storage coefficient (S). Estimates of T and S from pumping well data range from 530 ft^2/day to 697 ft^2/day and from 2.4 x 10^{-3} to 0.11, respectively. T estimates from the shallowest water table well data that range from 5455 ft^2/day to 9500 ft^2/day based on Neuman unconfined analysis are considered unreasonably large and unreliable. Excluding these estimates, observation well data yield T estimates ranging from approximately 53 ft^2/day to 1100 ft^2/day; however, the majority of the estimates are lower than for the pumping well and average 432 ft^2/day. Estimates of S from observation well data range from approximately 1 x 10^{-10} to 5 x 10^{-3}; estimates of horizontal hydraulic conductivity (Kh) range from <1 to 11 ft/day; estimates of vertical hydraulic conductivity (Kv) range from 8.6 x 10^{-5} ft/day to 1.5 ft/day; and estimates of aquitard vertical hydraulic conductivity range from 1.1 x 10^{-6} ft/day to 0.3 ft/day.

16. TTL has partnered with The University of Alabama and a professor at The University of Mississippi for groundwater modeling services. Two independent groundwater flow models will be developed from the laboratory and field data collected in the Twin Pines study area. the data collected to complete two independent groundwater flow models. One model will be a steady-state model using U.S. Geological Survey (USGS) codes in the MODFLOW family. A second transient surface-groundwater flow model (GSFLOW) will also be completed for the site. This model will couple both precipitation, infiltration, recharge, and surface water processes with groundwater flow to evaluate hydrology and hydrogeology for the site.

TTL will document the efforts described above in a series of reports, including:

- "Pumping Tests Conducted in the Twin Pines Project Area" – This report will describe the activities associated with and interpretation of two pumping tests conducted in the study area.