Soil samples from two different locations, specifically from the edge of a creek and the edge of a pond in West-Central Illinois, were compared using forensic analysis. Each soil sample contained a unique signature that was identified using different scientific techniques. In order to improve the field of forensic soil analysis, new methods and techniques must be implemented that can help reduce expenses while maximizing successful results. The main objective of the current project was to perform forensic soil analysis on different sites in West-Central Illinois using different methods and techniques. The methods included new techniques and procedures for compiling data involving microscopy, conductivity, redox potential, pH, settling rate, soil texture, and FTIR. Each of these analysis methods provided information about the samples from each location, allowing identification of their unique signatures. The collected data was compared in order to create a profile highlighting the key information that can be used to differentiate the two sites from one another. The best techniques and methods for the use of soil identification were determined. Both the techniques used and the data collected allowed for comparison of locations in West-Central Illinois, which could have great implications for the advancement of soil analysis methods that can aid in criminal investigations.