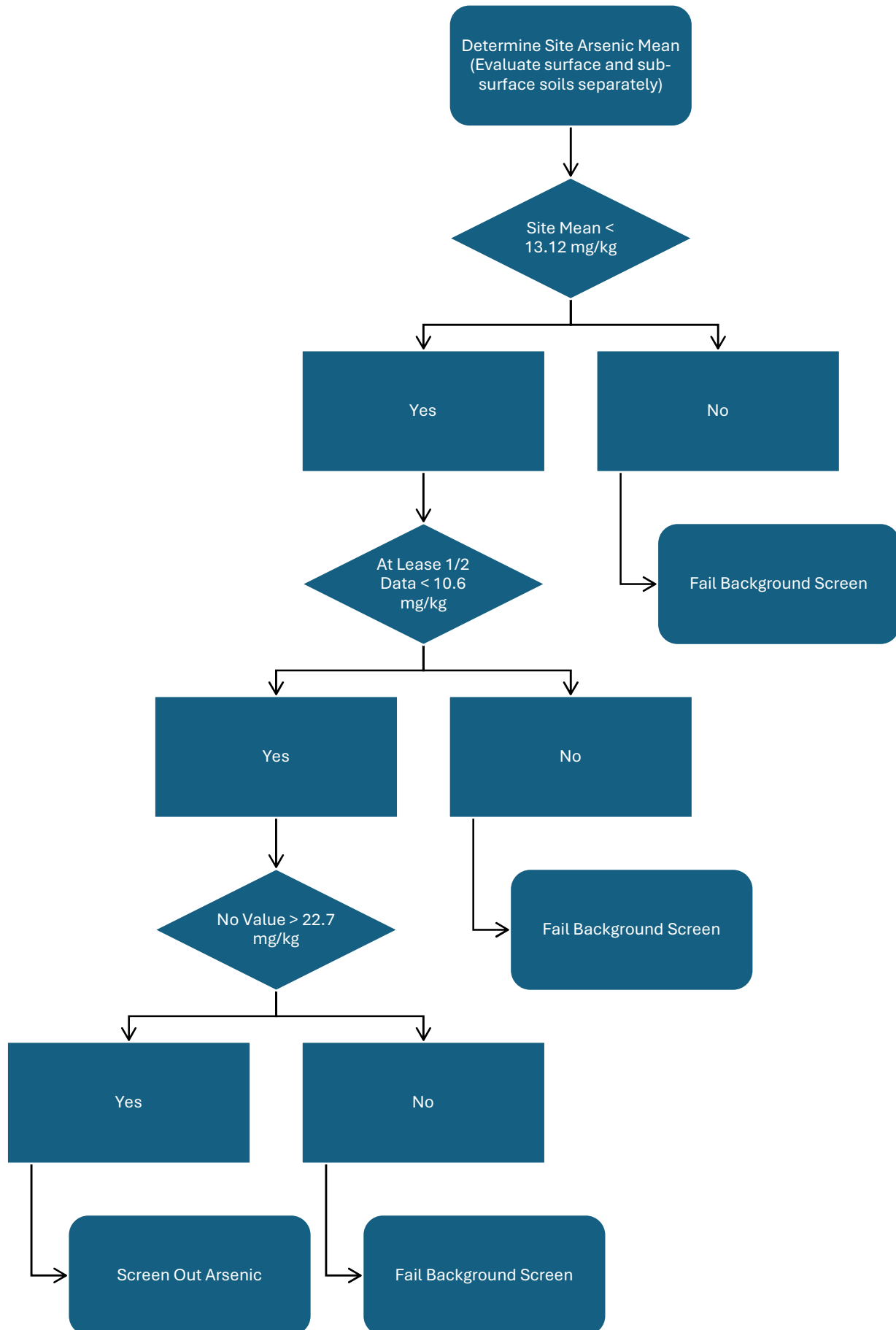


Development of Generic Approach to Assessing Arsenic Background in Soils for the Bluegrass Physiographic Region of Kentucky

Kentucky Guidance for Ambient Background Assessment (NREPC, 2004) addresses naturally occurring and anthropogenic background levels of inorganics (metals), including arsenic, in soil on a statewide basis. The statistics presented in that document were derived using a dataset containing inorganic sample results gathered from across the state. However, it has long been recognized that soils in the Bluegrass Physiographic Region of the state can contain higher levels of arsenic relative to other regions of the Commonwealth. This is thought to be due in part to the presence of abundant shale layers within this region which contain pyrite and arsenopyrite minerals (KGS, 2007).

To account for this distinct difference in soil arsenic concentration, a subset of the statewide arsenic dataset corresponding to samples obtained exclusively from within the Bluegrass Physiographic Region was used to generate statistics against which sites within the region could be assessed. This dataset contains arsenic analytical results for 219 soil samples obtained from various locations within the region believed to be representative of the region as a whole. Since the dataset did not correspond to any discernible distribution, non-parametric methods within ProUCL 4.0 (USEPA, 2007) were used to derive a 95% Upper Confidence Limit on the mean of 13.12 mg/kg, a 60th percentile value of 10.6 mg/kg and a 95th percentile value of 22.7 mg/kg. The approach used to generate these values is similar to that followed to derive the state-wide background statistics. These values can be used as shown in the following flow chart as an initial approach to screening soil against generic arsenic background for sites located within the Bluegrass Physiographic Region of Kentucky. Surface (0-1 foot) and sub-surface (> 1 foot) soils should be evaluated separately.

Arsenic Background Screening Process for Bluegrass Physiographic Region



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