

# AGGREGATE RESOURCE EVALUATION OF THE RAKO, BIRCHDALE, AND BIRCHDALE EAST PITS NEAR BAUDETTE, MN

by  
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## RAKO PIT

Approximately 80 acres, NW 1/4, Section 8, T. 157N., R. 31W.

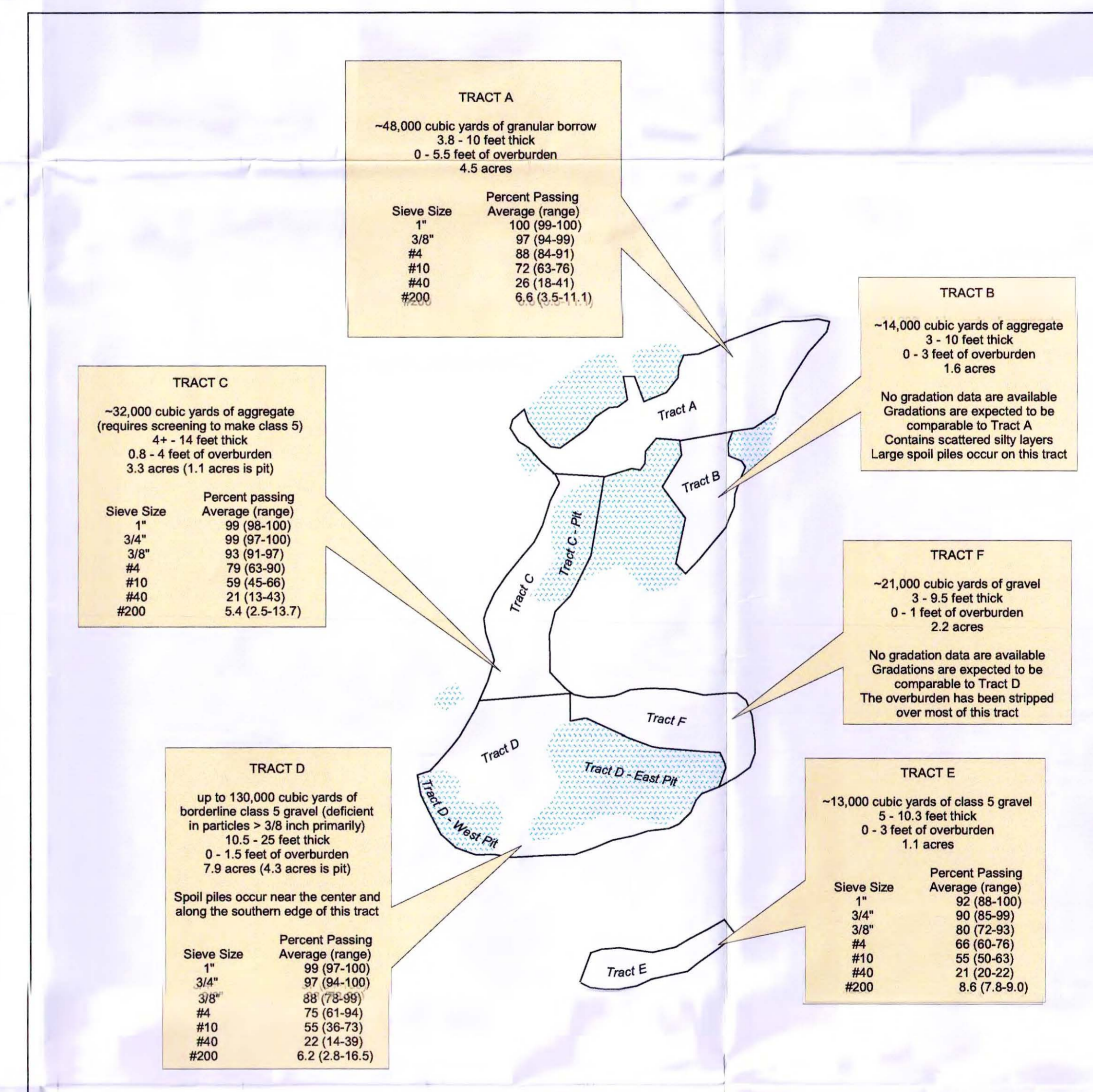
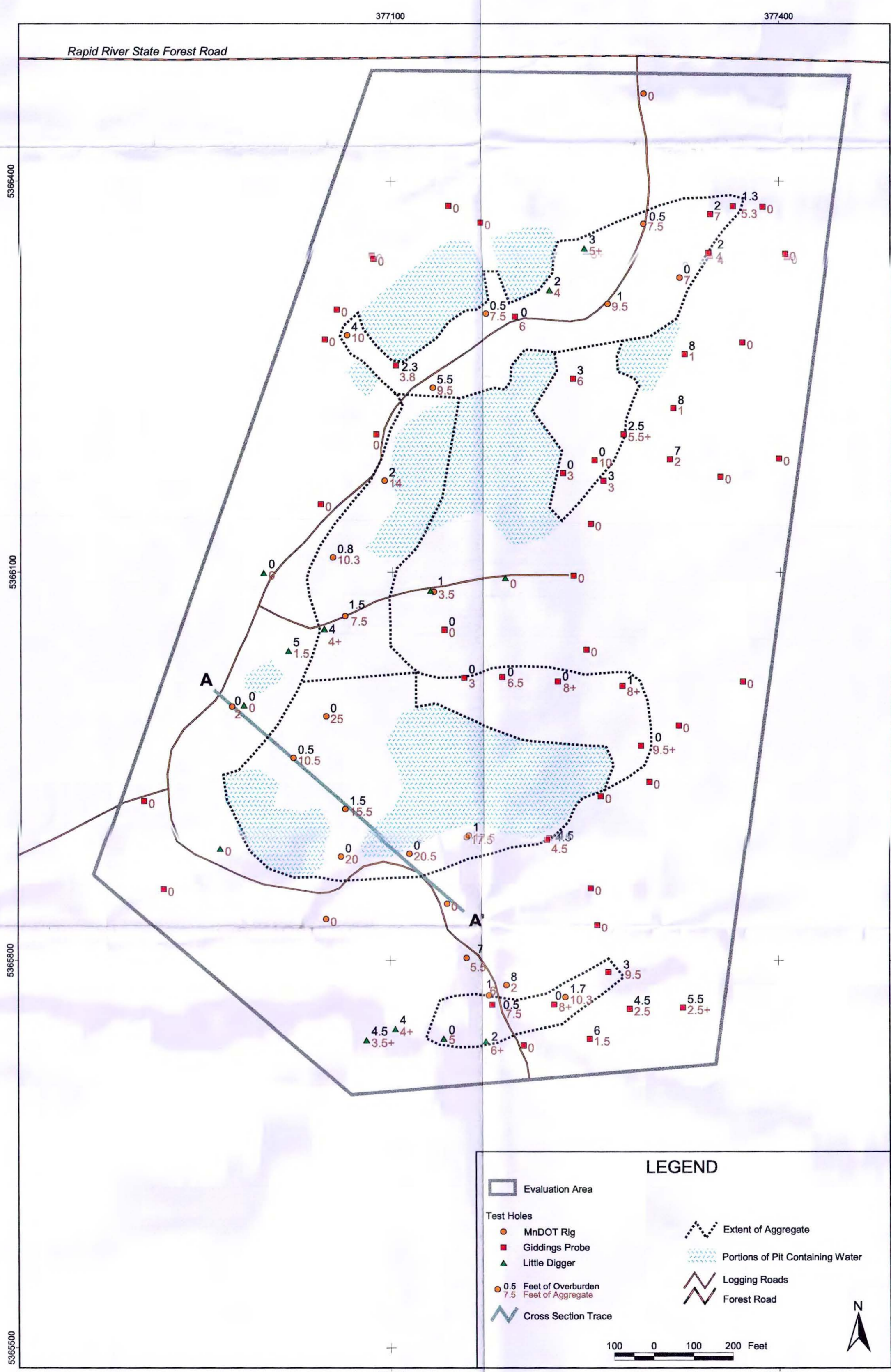
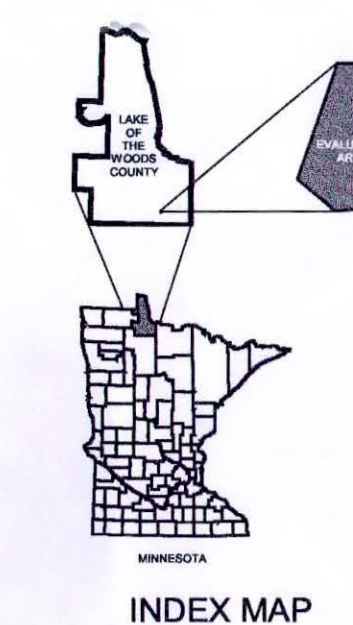


Figure 3. This graphic describes the character of aggregate in each tract marked by solid lines. Except for Tract E, nearly all of the rest of the site outlined above has been disturbed in the past. The stippled blue pattern represents pit areas with open water at the time of the evaluation (May 10-13, 1999). The gravel content of the resource increases towards the south. For effective pit management, the resource is divided into six tracts, A through F, based upon differences in gravel content and whether gradation data are available. Area, overburden and aggregate thickness, estimated volume, and gradation data (if available) are provided for each tract. The volume estimates were determined by taking the average thickness of gravel in the drill holes multiplied by the area of that tract. Allowances were made for estimated mined depths of the pits included within each tract. Mineable aggregate was defined as being at least 3 feet thick with a stripping ratio of 50% or less. Detailed gradation data are found in Appendix C.

Figure 1. This site map shows the location of test holes and access trails in the evaluation area and the estimated extent of remaining aggregate. Disturbed areas show up on the photo as lighter-colored patches compared to the darker forested areas towards the perimeter of the photo. Deeper portions of the pits are filled with water. The background photo was taken in 1991. Some mining has occurred since 1991 which is not reflected on this photo.

Figure 2. Estimated extent of the remaining aggregate resource and portions of the pit that contained water in May 1999 are shown above. Aggregate still remains in most portions of the water-filled pits within the aggregate boundaries. Reportedly, the pond area of several of the water-filled pits shrinks markedly during extended dry spells. Locations of test holes along with the feet of overburden and feet of aggregate encountered in each hole are listed. Feet of overburden are not shown when aggregate is not present. Map coordinates along the perimeter are UTM NAD83.

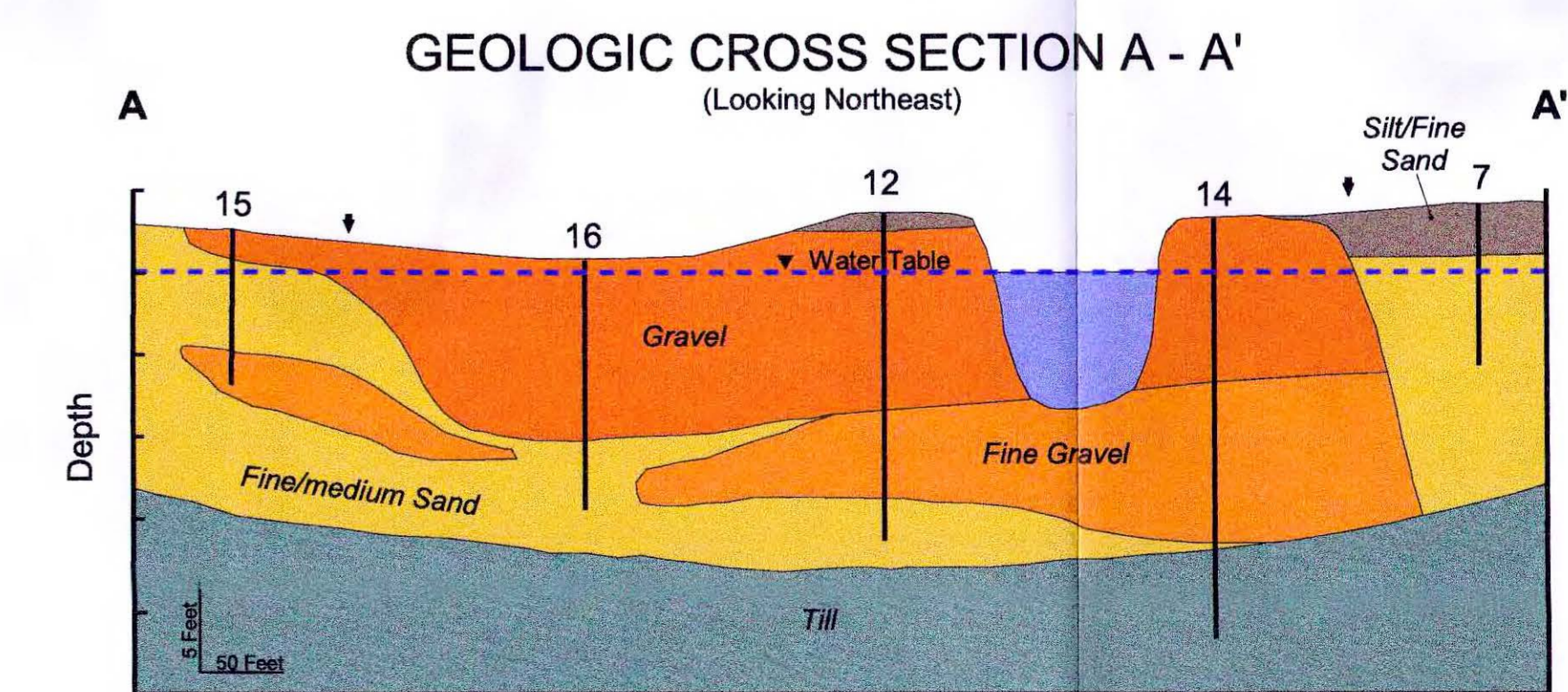


Figure 4. This cross section across Tract D depicts a rather complex aggregate deposit. The deposit generally is pod-like with layers of sand occurring somewhat randomly in the deeper portion of the deposit. The numbered vertical lines represent test holes. Elevation changes from hole to hole are based on the assumption the water table is horizontal. The extent of the deposit recommended for mining is represented by the vertical arrows above the cross section. Note that while this cross section is a reasonable interpretation of the data, other interpretations are possible. The actual distribution and extent of various sediments between test holes may not be as shown here. See Figure 2 for the location of this cross section. Vertical exaggeration is 10 times.