



*Figure 4. Ditchlike crater.*

The compactness of nuclear explosives is an indirect economic advantage. A 2-megaton nuclear explosive can be emplaced in a drilled hole a little over 1 meter in diameter and would weigh perhaps a few thousand kilograms. An equivalent energy yield from chemical explosives would require enough material to fill a volume of several thousand cubic meters and would weigh two million tons. The consequent production, logistics, and emplacement construction involve unimaginable problems.

On construction projects large enough to consider nuclear excavation, the same excavation by conventional means would require, in addition to chemical explosives, their combination with various earth-digging and earth-moving machinery. So any valid cost comparisons must contrast the most efficient conventional means with nuclear excavation techniques or must consider a combination of both techniques. In general, nuclear explosives could probably compete where they could be used in yields equivalent to several kilotons of TNT or more.

Many safety considerations are involved in nuclear excavations. Of most importance, exposure of people to the radioactivity must be controlled so that no one receives any hazardous amount. This requires an