The main problem in scaling up the sensitivity is to keep background effects a factor of at least 50 below the calculated solar-neutrino signal. The major background effect is from cosmic radiation. Cosmic-ray muons produce protons in the liquid, and these protons produce argon-37 by $Cl^{37}(p,n)Ar^{37}$ reaction. The argon-37 production rate by muons has been measured at a depth of 25 m.w.e., and from the known muon intensity and cross section for muon interaction the argon-37 production rate can be calculated as a function of the depth. Figure 4 shows the argon-37 production rate in 100,000 gallons of perchloroethylene from cosmic-ray muons at various depths. Also indicated on this plot is the argon-37 production rate expected from solar neutrinos, and the corresponding rates in various mines in the United States and India. It can be seen from this curve that the detector must be located at a depth of over 4000 m.w.e., or about 4400 feet of rock. Several mines in the United States could be used, and we are now negotiating for the use of one of these mines.

There is a background effect from fast neutrons from the rock wall. These neutrons produce argon-37 in the liquid by (n,p) followed by the $Cl^{37}(p,n)Ar^{37}$ reaction. Fast neutrons are produced by (α,n) reactions and spontaneous fission from the small amounts of uranium and thorium contained in the rock in the parts per million range. We have measured this fast-neutron background effect in two mines, and find the effect is at least a factor of 20 below the expected solar-neutrino signal. However, we are providing a water shield between the rock wall and the tank. This will be actually accomplished by flooding the tank chamber with water. Another source of background arises from small amounts of calcium and sulfur contained in the liquid. However, we find that commercial grade perchloroethylene is free of these impurities and background effects from this source is negligibly small.