



# GEOLOGIC FEASIBILITY ASSESSMENT

## National Underground Science Laboratory (NUSL)

### San Jacinto Mountains Site

### Palm Springs, California

#### PROJECT DESCRIPTION

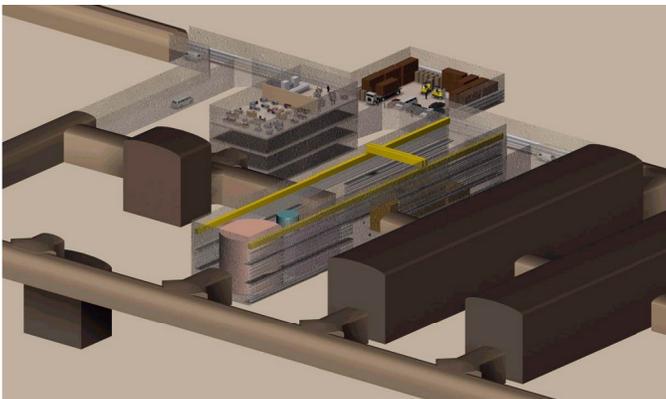
*Earth Consultants International* was retained by the University of California at Irvine and CNA Consulting Engineers to assist with the geologic characterization of a proposed High-Energy Neutrino Detection Laboratory to be located 10,000 feet under the San Jacinto Mountains. The National Underground Science Laboratory was a new proposal to the National Science Foundation, and a nationwide search was underway for the best possible site. The San Jacinto Mountains were identified early in the site selection process because of their proximity to the research group at UC Irvine, and because of the nearly ideal construction conditions of the granitic-cored mountains. However, the San Jacinto Mountains are an uplifted block in very close proximity to the San Andreas fault to the east, and bounded by the San Jacinto fault on the west, causing concern for active faulting through the NUSL tunnel and for rock quality, even at depth.



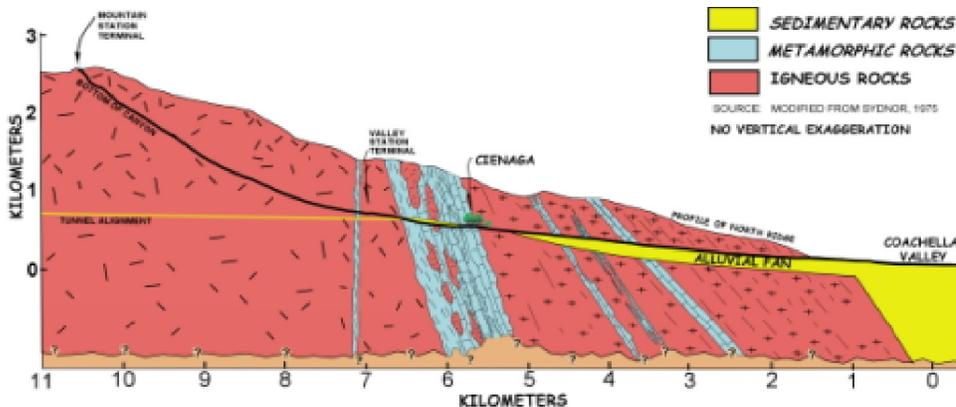
Looking west at the San Jacinto Mountains near Palm Springs, and towards the proposed portal entrance of the NUSL facility.

#### SOLUTION

*Earth Consultants International* reviewed the available geologic, seismic, and groundwater data for the San Jacinto Mountains and surrounding area, conducted on-site mapping, and prepared geologic cross sections. The San Jacinto's are cross-cut by numerous intrusion dikes that probably extend to the depth of the NUSL, and could impact the construction costs. The principal design concerns were: 1) the probability of these dikes controlling groundwater; 2) the possibility of faults through the NUSL facility; and 3) if present, whether these faults were active and/or serving as a groundwater barrier. Of concern to the design costs were the seismic design requirements imposed by the proximity of the San Andreas and San Jacinto faults. Our geologists also assisted the project team with several public presentations and in the final NSF proposal documentation.



Schematic illustration by CNA of the interior workings of the proposed NUSL facility, located 10,000 feet under the San Jacinto Mountains.



Simplified geologic cross-section through the San Jacinto Mountains and along the proposed 2-mile long NUSL tunnel.

