

#### Owner:

Turlock Irrigation District

#### Client:

Devine Tarbell & Associates

#### Timeline:

2007 - 2008

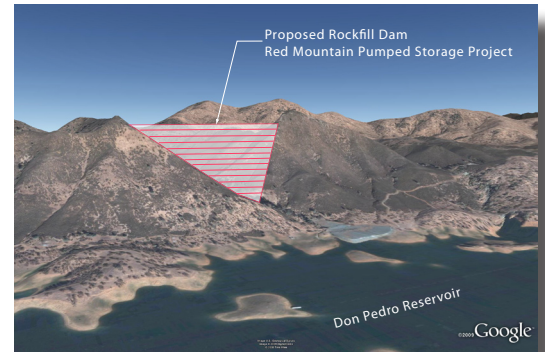
#### Services provided:

✦ Geologic evaluation

#### Key personnel:

Drew G. Kennedy  
T. Nathan Manley

Working with Devine Tarbell & Associates (DTA), SAGE provided supplemental geologic mapping, lineament analyses, and a fault activity evaluation services for feasibility-level geologic investigations of the Red Mountain Bar Pumped Storage project. Located on the north shore of Don Pedro Reservoir, in Tuolumne County, California, this proposed project will consist of a concrete faced rock fill dam, approximately 430 ft high at the maximum section, and an underground powerhouse complex with an estimated power generation capacity of 900 to 1000 MW. If constructed, the project will be the first significant dam and reservoir project in the foothills since New Melones in 1979.



During feasibility-level geologic studies, field mapping conducted by SAGE and DTA geologists, coupled with an analysis of aerial photography, identified a series of northwest trending lineaments that may represent a previously undocumented system of faults. Four of these lineaments project through the proposed dam footprint.

A fault activity study was undertaken to confirm the presence of the lineaments, evaluate whether they represent through-going faults or shear zones, and evaluate whether surface displacement has occurred on these structures in the last 35,000 years, per California Division of Safety of Dams (DSOD) guidelines. Possible trench locations were limited due to lack of suitable soils for pedochronological examination, a common problem in the Sierra Nevada foothills. Based on surface reconnaissance, three trenching sites were identified and six exploratory trenches totaling approximately 1,200 linear feet were excavated across the projected alignments of the four lineaments.



Results of the evaluation confirmed the presence and location of shear zones associated with two of the lineaments and field evidence indicates that these lineaments are representative of through-going faults or shear zones within a broader zone of deformation. However, structural mapping and pedogenic analysis showed that none of the shear zones identified in the trenches extends beyond bedrock into the soil horizons above, and no observable offset of soil or bedrock horizons was evident. If the project goes forward to 30% design, future work will include additional geological, geotechnical, and seismological studies.