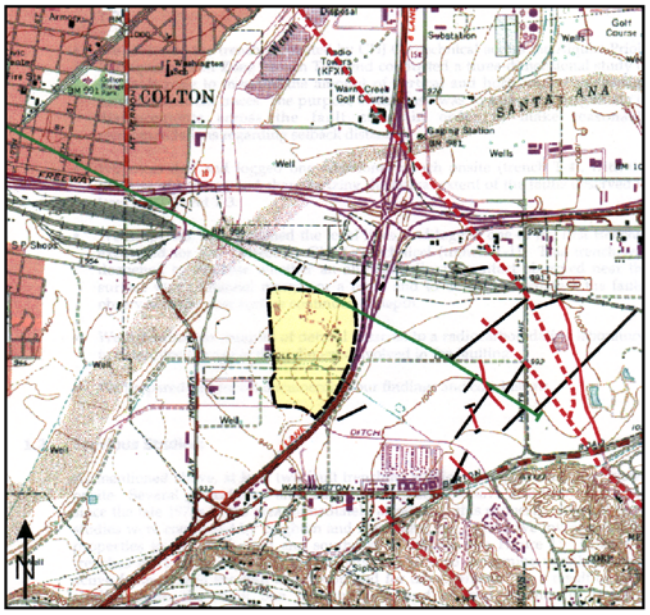
# Third-Party Review and Fault Trenching Investigation for an Industrial Site within the San Jacinto Fault Zone, Colton, California

## PROJECT DESCRIPTION

*Earth Consultants International (ECI)* was retained to conduct a third-party review and logging of several trenches excavated as part of a geotechnical study conducted by an engineering firm to assess the potential for surface fault rupture. The site, located east of Cooley Drive and west of I-215 in the city of Colton, California, had been previously investigated for faults by two other firms. The findings of these two earlier fault studies disagreed on whether any faults extend through the central portion of the site. We were asked to resolve this discrepancy and confirm the feasibility of developing the site. Two separate areas were investigated for faults:

1) the central portion of the site where the previous, inconclusive fault studies were conducted; and

2) the northeastern portion of the site, within the State-designated Alquist-Priolo Earthquake Fault Zone for the San Jacinto fault. This task had not been conducted as part of any if the previous studies at the site.




**Site location map showing the site studied in yellow and the southern edge of the Alquist-Priolo Earthquake Fault Zone in green.**

## SOLUTION

*ECI* reviewed geotechnical reports and paleoseismic studies at the site and adjacent properties and reviewed historical aerial photographs of the site. We logged four trenches excavated in the central portion of the site and one trench excavated across the Alquist-Priolo Earthquake Fault Zone. The trenches in the central portion of the site were more than 25-feet deep.

Several faults were exposed in the trenches, but these are not deep seated, earthquake-generating features. Instead, they die out downward at the top of a fine sand bed. From these observations, we concluded that these faults represent fracturing near the ground surface that occurred when the once-saturated sand layer liquefied when subjected to strong ground shaking, possibly as a result of earthquakes on the San Jacinto fault. A geotechnical study of the site to determine appropriate mitigation measures for liquefaction was recommended.

The trench across a portion of the Alquist-Priolo Earthquake Fault Zone exposed a narrow, northwest-trending fault zone. A 20-foot section of the trench was studied in detail using three-dimensional techniques. The purpose of this exercise was to quantify the amount of displacement per earthquake event across the fault zone exposed in this portion of the trench. From this study we determined that the fault has experienced at least 26 inches (66 centimeters) of horizontal offset and approximately 5 to 6 inches (12 to 15 centimeters) of vertical separation in about the past 1,900 years. These offsets may have well accumulated during more than one earthquake, since the fault is part of the San Jacinto fault zone, which probably ruptures every few hundred years. Compared with the main San Jacinto fault to the northeast, which could experience horizontal dislocations of 10 feet (approximately 3 meters) or more during an earthquake, this fault is minor. Nonetheless, it is, by the State's definition, an active fault and must be avoided. Structural setback recommendations were provided to the client.

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