

4.9 Geology

This section addresses potential effects on the HCLE Corridor alternatives associated with geophysical concerns, including mineral resources, seismicity, landslides as a result of erosion and runoff, paleontology, liquefaction, and subsidence. The existing geological setting was provided in Section 3.9, Geology Affected Environment.

4.9.1 Methodology for Impact Evaluation

The methodology employed to evaluate potential impacts on geological resources within the proposed alternatives focuses on determining, on a general level, the extent of impacts to unique geologic or physical landform features and mineral resources, and to determine potential hazards related to geophysics, such as soil type, seismicity, erosion, runoff, subsidence, landslides, and liquefaction.

The following effect criteria have been employed to address the existing geophysical setting of the study area and the magnitude of change that the proposed project could affect. These criteria are applied to the proposed bandwidth for the alternatives to determine whether the effects result in adverse impacts.

- C Triggering or accelerating geologic processes, such as landslides or erosion and slope failure.
- C Exposing people or property to geologic hazards such as landslides, mudslides, ground failure, or similar hazards; soil and/or seismic conditions so unfavorable that they could not be overcome by design, construction, and/or maintenance practices.
- C Elimination of a unique geological or physical landform.
- C Rendering of soil incompetent for use as a foundation.
- C Earthquake-induced ground shaking capable of causing ground rupture, liquefaction, settlement, or surface cracks resulting in the substantial loss of use.
- C Location of the site within an Alquist-Priolo Earthquake Fault Zone, or within a known active fault zone, or an area characterized by surface rupture that might be related to a fault.
- C Deformation of foundations by expansive soils (those characterized by shrink-swell potential).

For purposes of the Tier 1 analysis, it is presumed that, for each alternative, the entire bandwidth would be impacted by the ultimate project. Locations of rock types, faults and fault zones, and areas prone to liquefaction and subsidence were mapped. Clay soils, which are characterized as expansive soils, and the location of mineral resources are mapped in the proposed Riverside County General Plan (Figures OS-5 and Impact measurements include total number of encounters, crossings, or area calculations). Potential impacts to geological resources and hazards relating to geology were estimated according to number of linear crossings of, area encountered of, or adjacency to Mineral Resource Zones (MRZ), faults, steep topography (approximately 15 percent or greater), and USGS blue line streams within the alternative bandwidth. Potential Mitigation Measures to be Considered in Tier 2 were then formulated based on standards of avoidance, minimization, compensation, and on recent and past experience with agency requirements for mitigation.