

## **4.1 SOILS AND GEOLOGY**

### **4.1.1 Proposed Project**

#### **4.1.1.1 Affected Environment**

The cable route traverses the Mojave Desert Physiographic Province, an area characterized by north- to northwest-trending topography and geologic structure. The Mojave Desert is a wedge-shaped region located southeast of the Sierra Nevada and southwest of the Basin and Range Physiographic Province. It is a vast region dominated by rugged mountain ranges and alluvium-filled basins that extend from northern Nevada to Mexico and from California's Sierra Nevada and southern coastal region eastward to central Arizona and Utah. The region is bounded by the Garlock Fault on the north and northwest, by the San Andreas Fault on the southwest, and the San Bernardino Mountains on the south. The Mojave Desert has no definite eastern boundary, although this boundary is arbitrarily regarded as the Nevada border and the lower Colorado River.

Topographic features within the Proposed Project area include mountain ranges, alluvial fans and terraces, and alluvial plains and playas. The steep slopes of the mountainous regions experience rapid to very rapid runoff and commonly have high rates of erosion. Consequently, soil development is generally stunted because of rapid erosion and indurated parent material (bedrock). Moderate to slightly sloping alluvial fans and terraces experience medium to slow runoff, are characterized by moderate to slow erosion rates, and may have well-developed deep soils. Alluvial plains and playas experience very slow to no runoff and generally no natural erosion. Soils are typically poorly developed with high salt accumulation. In many places, wind has removed the fine soil particles from old alluvium, creating a surface of "desert pavement." The resulting surface is resistant to water and wind erosion.

The cable route contains soils belonging predominantly to the Aridisol and Entisol United States Department of Agriculture taxonomic soil orders. Aridisols are characterized by a low content of organic matter in the A horizon, salt or silica accumulations at depth, and low soil moisture. Entisols are young soils that characteristically lack developed subsurface horizons.

The Proposed Project is within the Mesquite Lake/Ivanpah area of the Mojave Desert region of unincorporated San Bernardino County, California. There are no known faults located within the vicinity of the Proposed Project. The Proposed Project is not located within an Alquist-Priolo Special Study Area. The nearest mapped fault is located in Fort Irwin approximately 40 miles west of any proposed replacement segment. There are no identified landslide, liquefaction susceptibility, or rock-fall- and/or debris-flow-hazard areas located within the general vicinity of the Proposed Project (San Bernardino, 2007, General Plan Geology Map No. CJDJC and CIDIC, and State of California Division of Mines and Geology Special Publication 42).

Liquefaction occurs when water-saturated sediments, mainly sand and silt, become suspended and flow due to vibratory motions such as those induced by earthquakes. The fiber optic route does not lie within an area designated as susceptible to liquefaction or that has liquefiable properties.

Landslides are the downslope movement of geologic materials. The stability of slopes is related to a variety of factors, including the slope's steepness, the strength of geologic materials, and the characteristics of bedding planes, joints, faults, vegetation, surface water, and groundwater conditions. The replacement segments are located on relatively flat terrain where landslides have not historically been an issue.

#### **4.1.1.2 Significance Criteria**

Pursuant to the California Environmental Quality Act (CEQA), an impact to soils and geologic resources would be considered significant if the Proposed Project:

- exposes people or structures to major geologic hazards, including rupture of a known earthquake fault, strong seismic ground shaking, slope failures, and subsidence;
- results in substantial soil erosion or the loss of topsoil;
- is located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- is located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- is located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse; or
- has soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Pursuant to the National Environmental Policy Act (NEPA), consideration of significant impact on the human environment is conducted in accordance with Title 40 Code of Federal Regulations 1508.27 (specified in Section 1.2.1 Relationship to NEPA Guidelines). Following the public comment period, a finding regarding a significant impact will be prepared in accordance with this provision.

#### **4.1.1.3 Impacts and Mitigation**

The Proposed Project consists of the replacement of portions of an existing fiber optic cable. Due to the Proposed Project's distance from the any known faults, there is a low possibility of ground rupture and significant ground shaking along the cable route. Further, the Proposed Project alignment is not located within an Alquist-Priolo Special Study Area and the nearest mapped fault is located in Fort Irwin approximately 40 miles west of the proposed alignment. Therefore, potential impacts resulting from strong seismic ground shaking would be less than significant and no mitigation measures are required pursuant to CEQA.

The Proposed Project does not lie within an area designated as susceptible to liquefaction; therefore, impacts from liquefaction are not anticipated. Because the Proposed Project area is relatively flat, the potential for a landslide or mudslide appears to be low and no known unstable geological or soil units exist within the Proposed Project area. The Proposed Project would be constructed within existing dirt roads and rights-of-way (ROW). As a result, no impact is anticipated.

Construction of the Proposed Project would not result in substantial soil erosion or the loss of topsoil. The replacements would be conducted within existing ROW utilizing cable plowing and/or trenching construction methods. These construction methods limit soil disturbance to an approximately 16-inch width at ground surface. Standard Best Management Practices (BMPs), as specified in Appendix H - Stormwater Pollution Prevention Plan (SWPPP), would be utilized to ensure soil erosion potential is minimized. BMPs would include, but are not limited to, immediate cover and compaction of the plow/trench line to return the soil surface to pre-construction design grade. With implementation of the SWPPP, a less than significant impact would occur.

The Proposed Project does not require the use of septic or sewer systems and would not generate wastewater. Portable toilets would be used during construction and would be managed and operated by a licensed sanitary waste contractor. As a result, no impact would occur.

To ensure that potential impacts due to the use of horizontal directional drilling are reduced to a less-than-significant level should the Proposed Project be approved, the Project applicant would be required to implement the following mitigation measures:

- MM-GEO-01: The Project applicant shall notify the BLM and the CSLC at least 15 days in advance of any horizontal directional drilling activity that would take place on lands under the jurisdiction of the BLM.
- MM-GEO-02: The Project applicant shall notify the CSLC at least 60 days in advance of any horizontal directional drilling activity that would take place on land not under the jurisdiction of the BLM. The conduit shall be installed at a depth to be specified by a geotechnical investigation. The notification shall include:
  - Engineering design drawings as issued for construction, certified by a California Registered Civil/Structural Engineer, showing cable conduit horizontal alignment with key control points referenced to the California Coordinate System (CCS83) and vertical profile data with elevations referenced to Mean Lower Low Water datum where applicable or otherwise, to the local vertical control datum. The drawings are to provide information such as tie-in details, conduit grade and material specifications, minimum bend radius, cathodic protection information (if any), co-ordinates of the entry and exit points, etc. Also, the CSLC's lease boundaries need to be delineated on the drawings.
  - A site specific geotechnical report certified by a California registered Geotechnical Engineer, including boring logs, and confirmation of the fitness of purpose of the proposed drilling program and any geotechnical recommendations for safe horizontal directional drilling installation.
  - A set of calculations to determine the required pulling load during pullback operations including any buoyancy control plan (if required), to successfully install the conduit.
  - A detailed drilling program together with detailed specifications of the boring machine to be used including the maximum pulling and snubbing capabilities, the directional survey methods to be used including equipment and controls, allowable bore deviation tolerances, verification that the completed bore is within the lease ROW and achieves the required clearance, etc.
  - Detailed specifications of the mud system and a complete listing of additives to be used including a copy of the Material Safety Data Sheet for the drilling mud.
  - A detailed drilling mud program and a frac-out contingency plan.
  - Additionally, any abandonment contingency plans in case the boring operations are forced to be suspended and a partially completed bore hole abandoned.
  - Also, include a plot plan depicting the location of the entry pit, exit hole, where equipment and materials will be stored, and where refueling of equipment will be performed.
  - AT&T shall implement their Horizontal Directional Drilling: Contingency and Resource Protection Plan, dated July 2007, during all drilling operations.

#### **4.1.2 No Action Alternative**

Selection of the No Action Alternative, as described in Section 2.5.1 No Action Alternative, would not result in construction of the Proposed Project and potential effects to soils and geological resources described in Section 4.1.1.3 Impacts and Mitigation would not occur.