

3.7 GEOLOGY, SOILS, AND SEISMICITY

This section examines impacts associated with the Orchard Park Redevelopment component of the 2018 LRDP on geology, soils, and seismicity resources. Impacts associated with soil quality in relation to agricultural use of soil are addressed in Section 3.2, “Agriculture and Forestry Resources.” Information on the effects of erosion and sedimentation and water quality are addressed in Section 3.10, “Hydrology and Water Quality.”

Public comments on the NOP included concerns regarding erosion. As they pertain to implementation of the Orchard Park Redevelopment component of the 2018 LRDP, these impacts are described and addressed within this section.

3.7.1 Regulatory Setting

Plans, policies, regulations, and laws (applicable to and/or considered for the Orchard Park Redevelopment component) are provided in Volume 1 of this EIR. As the regulatory setting provided in Volume 1 considers potential development, including the Orchard Park Redevelopment component, within the entirety of the UC Davis campus as envisioned through the 2018 LRDP, no additional regulatory setting is provided for the Orchard Park Redevelopment component.

3.7.2 Environmental Setting

Section 3.7, “Geology, Soils, and Seismicity,” (Volume 1) presents the environmental setting related to geology, soils, and seismicity for the entire UC Davis campus, including the Orchard Park site. The geology and soils of the Orchard Park site share the typical characteristics of the campus overall. Soils are alluvial and deep, and while campus soils exhibit a wide range of shrink-swell potential, at the Orchard Park site this potential is low. Similarly, the potential for erosion is low because of the level topography. It should, however, be noted that the alluvial soils of the campus tend to dislodge with heavy precipitation and runoff. There are no natural watercourses on the Orchard Park site and no outcroppings of bedrock.

3.7.3 Environmental Impacts and Mitigation Measures

SIGNIFICANCE CRITERIA

Refer to Volume 1, Section 3.7, “Geology, Soils, and Seismicity,” for a discussion of applicable Significance Criteria.

ANALYSIS METHODOLOGY

See Section 3.7, “Geology, Soils, and Seismicity,” in Volume 1 for analytical method relative to geology, soils, and seismicity. Site-specific geotechnical assessments will be required as part of the design and site assessment for specific buildings and components, in compliance with University of California policy and the California Building Code (CBC).

ISSUES NOT EVALUATED FURTHER

The following impacts were identified as part of the analysis of the 2018 LRDP, and are either (1) adequately evaluated at the program level of analysis of the 2018 LRDP or (2) not applicable to the Orchard Park Redevelopment component.

Surface Fault Rupture

Analysis provided in Volume 1 of this EIR concluded that there are no known earthquake faults or Alquist-Priolo Earthquake fault zones on the UC Davis campus, and thus, the 2018 LRDP, including the Orchard Park Redevelopment component, would not expose people or structures to the risk of surface rupture of an earthquake fault. No additional project-level analysis is necessary.

Seismic-Related Ground Failure

As discussed in Section 3.7, “Geology, Soils, and Seismicity,” of Volume 1, geotechnical investigations that address the potential for ground failure are routinely performed for every applicable project, including the Orchard Park Redevelopment component. A geotechnical investigation of the site would be conducted which would provide specific recommendations regarding foundations types and other considerations for the final design of each structure, in compliance with the CBC. As discussed in Section 3.7, “Geology, Soils, and Seismicity,” compliance with the CBC would reduce potential impacts associated with seismic activity, including the risk of liquefaction, to a less-than-significant level (2018 LRDP Impacts 3.7-1 and 3.7-2) by state and campus safety programs already in place. No additional project-level analysis is necessary.

Unstable Soils

The campus also adheres to the University of California Seismic Safety Policy, and the campus Standards and Design Guide, which requires seismic safety measures. Procedures mandated by the campus Office of Environmental Health and Safety (EHS) and departmental emergency response plans further reduce the hazards from seismic shaking. Section 3.7, “Geology, Soils, and Seismicity,” of Volume 1 concluded that potential impacts related to unstable and expansive soils were less than significant because of building codes, regulations, and best management practices (BMPs) already in place (2018 LRDP Impact 3.7-5). No additional project-level analysis is necessary.

Landslides

As noted in Volume 1, because of the level topography and lack of significant slopes, development of the Orchard Park site would not be subject landslides. No additional project-level analysis is necessary.

Construction-Related Erosion

The potential for construction activities to dislodge soils or create conditions where they are susceptible to erosion was determined to be less than significant because of compliance with the CBC provisions regarding soil compaction and sediment control during construction, as well as compliance with NPDES permits requiring preparation of a Stormwater Pollution Prevention Plan (SWPPP) (2018 LRDP Impact 3.7-3). The SWPPP details BMPs that will be employed on a site-specific basis. The campus EHS department provides oversight for compliance with these regulations and a comprehensive program of review and enforcement for erosion control at development sites. No additional project-level analysis is necessary.

Septic Tanks

The Orchard Park Redevelopment component would not include septic tanks or alternative wastewater disposal systems: therefore, impacts related to construction of these systems would not occur, and no additional project-level analysis is necessary.

Mineral Resources

As noted in Volume 1, the UC Davis campus, including the Orchard Park site, is not located in an area of significant mineral deposits (specifically aggregate rock). Additionally, the Orchard Park site was previously developed with student housing and is not indicated as a locally important mineral resource site. As a result, impacts related to mineral resources would not occur, and no additional project-level analysis is necessary.

Paleontological Resources

As discussed in Volume 1, the UC Davis campus, including the Orchard Park site, is underlain by quaternary alluvium from the Holocene period that is generally less than 10,000 years old. The soils of the area are deep, unconsolidated, alluvial units with a low likelihood of producing fossils. As a result, impacts related to paleontological resources would not occur, and no additional project-level analysis is necessary.

PROJECT-SPECIFIC IMPACTS AND MITIGATION MEASURES

Impact 3.7-1: Potential for soil erosion associated with long-term operations and maintenance activities.

Development and occupancy of the Orchard Park site could change the pattern of surface runoff or stormwater management such that areas that are susceptible to erosion are exposed to more runoff and experience increased rates of erosion. Large quantities of overland flow could result in rill or gully erosion and decrease soil stability and productivity. This would be a **potentially significant** impact.

As discussed under Impact 3.7-4 of Volume 1 of this EIR, with prolonged exposure to stormwater, campus soils may exhibit characteristics that create a proclivity to erosion from rain and runoff, which can affect soil productivity and stability. Severe erosion can create or exacerbate soil instability and produce a positive feedback cycle with respect to soil erosion. While the Orchard Park Redevelopment component of the 2018 LRDP would be regulated by the Phase II Small MS4 Permit program, this program would not necessarily reduce or eliminate the collection of flows during high precipitation events or during wet times of the year.

Under wet conditions, sheet runoff can detach soils and result in sheet erosion, which in turn can produce an overall loss in farm soil and productivity. Variations in surface roughness can eventually lead to a preferred pathway for water to flow, and can create small incisions in the soil, known as rills. If these incisions are not remediated, they can further incise and lead to large-scale gully erosion. These issues, if left unchecked, would result in a **potentially significant** impact with respect to the risks associated with erosion.

OPR Mitigation Measure 3.7-1: Manage stormwater flows to reduce soil erosion.

Implement 2018 LRDP Mitigation Measure 3.7-4.

Significance after Mitigation

Implementation of OPR Mitigation Measure 3.7-1 would require drainage studies of projects proposed under the 2018 LRDP and would ensure that necessary stormwater systems and/or onsite detention facilities would be engineered and constructed with appropriate sizing for anticipated storm events. This mitigation would reduce potential impacts associated with long-term exposure to stormwater flow and subsequent erosion to **less-than-significant** levels.
