

4.10 GEOLOGY**4.10.A Earthquake Hazards**

This response addresses comment LA5-12, which relates to the stability of canal levees in relation to seismic activity and rodent activities.

Fairfield Canal and Le Grand Canal are unlined canals surrounded by soils that are mainly claylike with some silt. As explained in the discussion of Impact 4.6-4 in the Draft EIR, it is unlikely for levees to fail due to ground shaking. If the canals were surrounded by sandy soils, levee failure due to ground shaking would be more likely. When granular, sandy soils are subjected to ground shaking, liquefaction can occur. MID officials have stated that MID does not know of any granular, sandy soil surrounding Fairfield Canal and Le Grand Canal and that MID is not concerned with levee failure due to liquefaction caused by ground shaking. Also, as stated in Draft EIR Section 4.6.2.3, the chance of strong seismic ground shaking is not considered significant in the project area. Although the potential of levee breaches due to ground shaking is low, UC Merced will undertake several actions to further minimize the risk of levee breaches.

As described in Section 2.9 of the Draft EIR, the two canals would undergo levee stabilization with methods as determined to be appropriate by the Campus and MID. Seepage drains would be installed on the downgradient side of the canals, and subsurface drains would be installed on the outer side of the canal levee. As described in Section 2.7 of Volume II for the Draft EIR, as a part of implementation of the Phase 1 Campus project, an extraction trench or slurry wall on the outer edge of the Le Grand Canal levee will be constructed to prevent potential canal failure or overtopping. Mitigation Measure 4.6-3 has been revised in response to this comment. See Volume 2, Section 7 of this Final EIR. As a part of revised Mitigation Measure 4.6-3, a Certified Engineering Geologist or Licensed Geotechnical Engineer will assess detailed seismic, geologic, and soil conditions at each construction site. These studies will include an inspection of the levees of Fairfield Canal and Le Grand Canal for any construction site near or spanning over (like a bridge) the canals. Geotechnical recommendations will be made to mitigate for seismic hazards. These recommendations will be included and implemented in the project design.

The levees of the canals will be monitored within the campus for rodent activities. Most likely, a Facilities Service Department - Custodial Division will be charged with the control of rodent activity on the campus. Please refer to the UC Davis document, "Policy and Procedure Manual, Section 290-45 - Pest Management," posted on the website, <http://www.mrak.ucdavis.edu/web-mans/ppm/290/290-45.htm>, as an example of the management practices that UC Merced may develop in regards to rodent activities. Mitigation Measure 4.6-3(b) has been added to the Draft EIR in response to this comment. See Volume 2, Section 7 of this Final EIR.

4.10.B Other Concerns

This response addresses comment O28-38, which asks about unplowed soil resources (paleosols) in the eastern Merced County area.

As discussed in Section 4.6.2 of the Draft EIR, the proposed UC Merced Campus will be located on seven different geological, bedrock units and 11 different soil series. In order from oldest to

youngest, the geological units within the proposed Campus site are: Mehrten Formation; Laguna Formation, Lower Alluvial Member; Pliocene Laguna Formation, China Hat Gravel Member; North Merced Gravel; Riverbank Formation; Modesto Formation; and Holocene Alluvium. These geological formations have created the following soil series within the proposed project area: Riverwash, Tujunga, Redding, Corning, Hopeton, Raynor, Pentz, and Peters. Table 4.6-1 of the Draft EIR shows the association of geological units with their corresponding soil series.

The construction of the UC Merced Campus will cover areas of unplowed soil; however, of the 2,000 acres within the bounds of the Campus, 1,090 acres will not be developed under implementation of the LRDP. Of these 1,090 acres, 750 acres will be preserved as the Campus Natural Reserve and 340 acres are designated for the Campus Land Reserve. As discussed in Section 2.6.2 of the Draft EIR, no development is planned or proposed by the LRDP within the Campus Land Reserve, but the land, which is contiguous to the Main Campus, would be left as open space to preserve the future opportunity to accommodate potential additional land uses beyond the Main Campus that are presently unknown and unforeseeable. The 750-acre Campus Natural Reserve would be maintained permanently in an undeveloped state and is anticipated to be managed under the UC NRS. Within the scope of the LRDP, this contiguous 1,090-acre area would be available for teaching, research, and outreach purposes so long as these activities do not conflict with the management practices of the reserves. As illustrated on Figures 4.6-1 and 4.6-2 in the Draft EIR, this 1,090-acre area contains all the above-listed geological formations and soil types present in the proposed project area. Therefore, any unique, unplowed paleosols located in the eastern Merced County area will be available to be studied.

In addition, as stated in Section 2.6.3 of the Draft EIR, by creating an area to remain undeveloped that contains natural resources of great interest, like unplowed paleosols, the Campus Natural Reserve will play a role in attracting top-quality faculty and graduate students to UC Merced who will have a primary interest in studying and conducting research on the natural resources in the Campus Natural Reserve. Therefore, the creation of the UC Merced Campus would facilitate increased knowledge of the paleosols by having a major research university located adjacent to and within easy access to a permanent natural reserve that contains these resources.