4.5 HYDROLOGY and WATER QUALITY

4.5.1 Setting

This discussion is based on information and prior analyses conducted for the 1998 CSUCI Master Plan EIR, 2000 CSUCI Master Plan, and 2004 Campus Master Plan SEIR.

a. Existing Drainage System. The backbone drainage system within the Master Plan area contains two primary watersheds, the northern system and the southern system. Both of these systems originate in the adjacent Santa Monica Mountains, then eventually converge into a 4.4-acre irrigation pond at the downstream end of Long Grade Canyon Creek near the existing Wastewater Treatment Facility. From there the confluenced systems eventually flow through a series of four parallel reinforced concrete pipes (48-inch diameter) under Lewis Road and into Calleguas Creek. These pipes are controlled by automatic flap-gates such that when flows in Calleguas Creek rise above the flap-gate level, they are closed to influent flows from the Long Grade Canyon Creek watershed.

An unnamed natural creek that traverses the northern portion of the CSUCI site currently comprises the existing northern system. This unnamed creek collects flows from the offsite watershed in the Santa Monica Mountains and transmits the flows through a culvert beneath Channel Islands Drive at the gap in the adjacent hills and into a manmade meadow adjacent to and easterly of University Drive. From there the flows are conveyed through an existing double-barreled box culvert under University Drive, off the campus property, and into the adjacent agricultural fields. The flows then spread out and sheet flow southerly to the southwest corner of the agriculture fields where they are temporarily stored in a 1.1-acre irrigation ditch parallel and immediately adjacent to Long Grade Canyon Creek. The water from this ditch is pumped through one of the culvert pipes under Lewis Road to Calleguas Creek or into the aforementioned pond depending on the current agricultural needs.

Long Grade Canyon Creek and an existing debris basin currently comprise the southern system. Located easterly of the main campus, the debris basin was cleaned and repaired in 2002. It now offers protection from upstream debris production or attenuation of flood peaks. This basin is also area is planned to serve a dual use as outdoor playfields for use by the proposed K-8 School located near the site. The playfields would be designed to act as a catch basin for potential overflow flooding from Long Grade Canyon Creek. The flows that originate upstream of the debris basin continue through the basin and into Long Grade Canyon Creek. Flows follow the creek alignment through the east campus area, under an existing bridge (Rincon Road), through the northwest corner of the core campus, under an existing bridge (University Drive), and out towards Lewis Road.

Long Grade Canyon Creek within the site is contained in a trapezoid earthen channel lined with rock that was constructed around 1941 during development of the site as a hospital. This rock-lined channel transitions downstream of the University Drive bridge to an earthen bank channel that currently is mostly outside of the campus property. Near the northwest corner of the Camrosa Wastewater Treatment Facility, the channel is blocked to help form the 4.4-acre irrigation pond. High flows discharge through a single pipe (approximate 24 inches in

diameter) and over an earthen weir into the irrigation pond. Low flows tend to back up in Long Grade Canyon Creek and form small ponds. As storm flows fill the irrigation pond, it eventually discharges into Calleguas Creek via the parallel pipes under Lewis Road.

b. Flooding. Areas of the CSUCI campus are susceptible to flooding as illustrated on FEMA flood maps (See Figure 4.5-1). Calleguas and Long Grade Canyon Creek carry water that has the potential to overtop or flood its boundaries.

Water runoff from north of the area adjacent to Long Grade Canyon Creek flows via sheetflow to the south of the property, where flows then collect and flow westerly into the 1.1-acre irrigation ditch. This agricultural land, particularly north of the Camrosa property, floods frequently and standing water is generally present for several days or more following winter storm events. All of this acquisition area is within the 100-year flood zone for Calleguas Creek, as indicated in Figure 4.5-1.

The Calleguas Creek watershed is approximately 343 square miles and collects water from several urban areas, including the cities of Simi Valley, Moorpark, Thousand Oaks, and Camarillo. Peak flow upstream of the Camarillo Drive bridge is estimated at 36,000 cfs during the 100-year storm. Because Calleguas Creek collects runoff from such a large watershed, this peak flow occurs more than 1,274 minutes (more than 21 hours) after the beginning of the design storm event. Peak flows from the project site would occur about two hours prior to the peak within the creek.

While Calleguas Creek is confined within a levee system, the flow from a 100-year storm is not contained within this system. Overflow occurs on both sides of the channel within the vicinity of the campus, especially within the agricultural land north of the campus, including in the proposed expanded acquisition area. Ventura County Flood Control District does not have any current plans to contain this flow. The campus site is generally protected from flooding caused by Calleguas Creek by berms associated with Long Grade Canyon channel and a road berm south of the northern property line. However, the recently revised 100-year floodplain indicates flooding in the ruderal vegetation along Camarillo Drive and in the field north of the cogeneration plant. This flooding is probably associated with the inability of storm water coming from the site to discharge into Calleguas Creek, and also because the open field north of the cogeneration facility serves as a retention basin, as discussed above.

The 2004 SEIR addressed the acquisition of the area where the proposed roadways will be constructed and its potential for flood impacts. Storm water would flow down Long Grade Canyon Creek, receiving storm drainage from the new residential areas and flows from existing and proposed storm drain systems of the core campus. However, the 2004 SEIR analyzed impacts relational to the 100-year flood scenario. The proposed roadway would include a change in flood protection from a 100-year to a 25-year storm scenario. The proposed entrance roadway will be equipped with culverts to direct surface water flow from north of the road southward beneath the new road and across the future playfields. Water is expected to pond on the north side of the new levee (discussed below), just west of the future secondary road. This low flow "holding area" or high flow "ponding area" will be equipped with a future pump station to pump water over the new levee and into the area between the existing North Levee and the new levee in the event of a major flooding event. Further discussion of this issue can be

found in section 4.5.2, *Impact Analysis*, below.

A new earthen levee is proposed to the north of Long Grade Canyon Creek, north of the existing North Levee, designed to contain waters within Long Grade Canyon Creek channel during a 100-year flood event. The proposed new earthen levee will be constructed within the expanded 154-acre new access road area from the intersection of the proposed new entrance road with Long Grade Canyon Creek westward to Old Lewis Road. In addition to the new earthen levee, seven 5.5 foot by 5.5 foot reinforced concrete boxes (RCB) with flapgates are proposed at the western terminus of Long Grade Canyon Creek at Old Lewis Road south of the proposed new levee. This RCB outlet system will be in addition to the existing system of four 48-inch diameter reinforced concrete pipes already in place adjacent to the west of the existing North Levee.

The proposed new outlet system will enhance water flow from Long Grade Canyon Creek under Lewis Road and into Calleguas Creek. The new RCB outlet system will also be controlled by automatic flap-gates such that when flows in Calleguas Creek rise above the flap-gate level, they are closed to influent flows from the Long Grade Canyon Creek watershed.

4.5.2 Impact Analysis

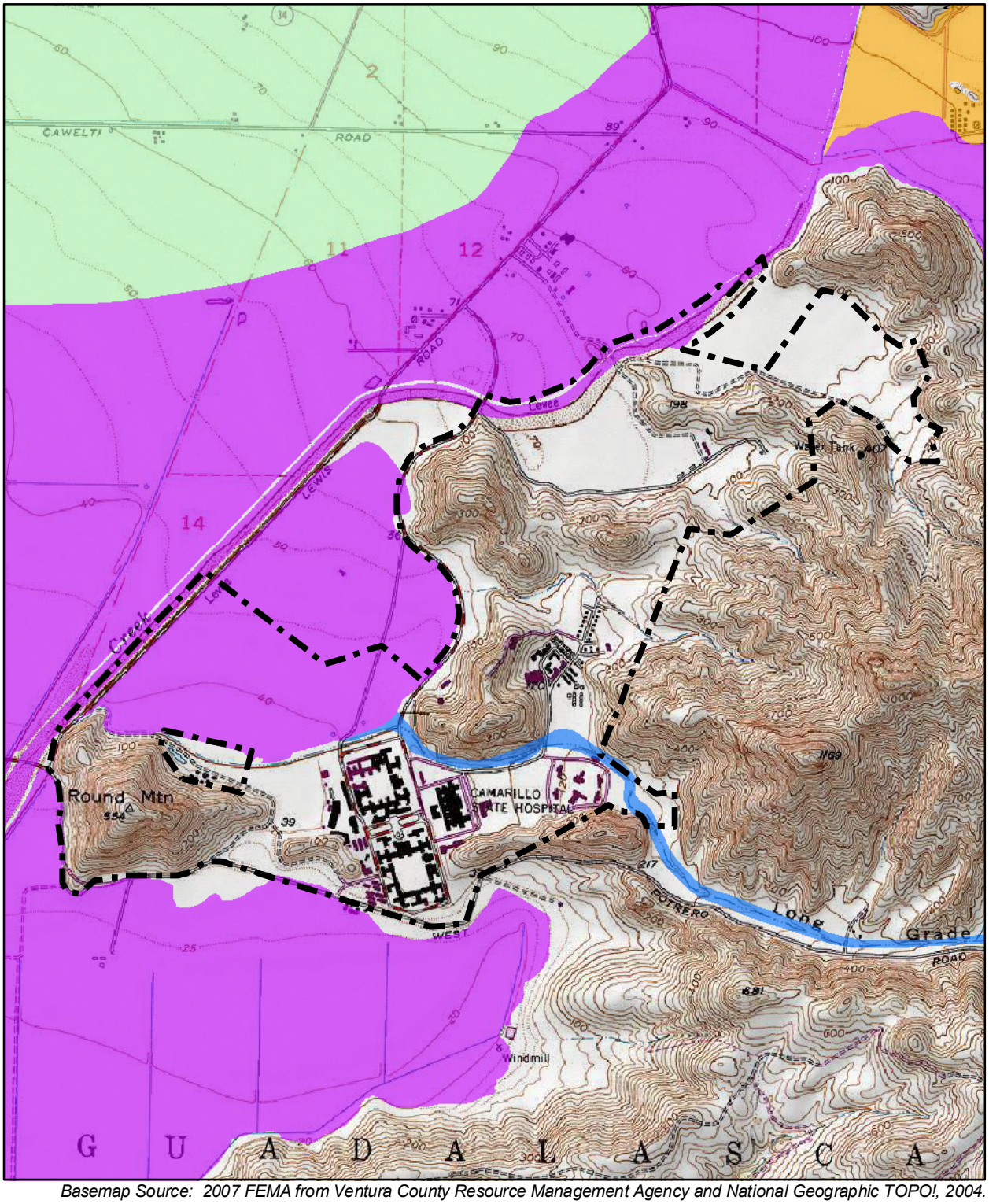
a. Methodology and Significance Thresholds. Previous analyses of the drainage of the project site were prepared for the Master Plan Area as part of the 1998 Campus Master Plan FEIR (1998 FEIR) , the 2000 Campus Master Plan SEIR (2000 SEIR), and the 2004 Campus Master Plan SEIR (2004 SEIR) which have been incorporated herein by reference. The potential for flood hazards at the facilities project sites is based on a comparison of proposed site uses and their locations relative to available flood hazard mapping and proposed drainage alterations. Impacts related to flooding are considered significant if the flooding causes direct or indirect risks to human lives or structures.

b. Project Impacts and Mitigation Measures. Elements of the 2009 Facilities Projects that may affect the hydrology of the site beyond what was discussed in the 1998 EIR, the 2000 SEIR, and the 2004 SEIR are described below.

Significant drainage effects were previously identified to occur as a result of the CSUCI Master Plan, as discussed in the 1998 FEIR, 2000 SEIR, and the 2004 SEIR. The following discussion is limited to changes and additional impacts that would result from the proposed facilities projects.

09-Impact HYD-1 **The updated design and proposed modification of mitigation measure 03-HYD-1 for the proposed primary access road would result in protection from 25-year floods rather than 100-year floods as previously proposed. The impact is Class II, *significant but mitigable*.**

The construction of a new entrance road and other facilities in the new access road area was addressed in the 2000 SEIR (Impact HYD-1) and the 2004 Master Plan.



Basemap Source: 2007 FEMA from Ventura County Resource Management Agency and National Geographic TOPO!, 2004.

Site Boundary
0.2 PCT ANNUAL CHANCE FLOOD HAZARD
100-year Floodzone (Zone A)
Areas of 100-Year Floodzones which may be Protected by Flood Control Structures (Zone AE)
100-Year Average Shallow Flooding (AO)

N

0 1,000 2,000 4,000 Feet

Calleguas Creek 100-Year Flood Plain Figure 4.5-1

The location of the proposed entrance road has not changed and it extends southeasterly from Lewis Road, north of Long Grade Canyon Creek to intersect with the Campus Core, which is located on the southern side of Long Grade Canyon Creek.

It was previously determined that the roadway should be elevated above the 100-year floodplain. However, the area is susceptible to overflows from Calleguas Creek on the west, which is only designed for 25-year flood protection. Therefore, even if the roadway were designed to 100-year flood protection from Long Grade Canyon Creek, the area would still be affected by floods greater than 25-year events due to adjacency to the Calleguas Creek levee. Therefore, the following mitigation measure modification is proposed as part of this project. The mitigation measure is shown with new language in underline format and deleted language shown in ~~strikethrough~~ format.

~~**03-HYD-1**~~
09-HYD-1(a) The primary access road, extending southeasterly from Lewis Road, and lying north of Long Grade Canyon Creek, ~~in the expanded 79-acre acquisition area~~ shall be elevated outside the ~~100-~~25-year floodplain.

As discussed in the 2000 SEIR, this area requires adequate drainage. In addition, the elimination of the function of this area as a retention basin places a larger burden on downstream facilities and may increase flooding of adjacent properties to the north. Therefore, the following additional mitigation measure was recommended to offset the impact of modifying this portion of the watershed. The mitigation measure has been updated to replace the 100-year flow design parameter with a 25-year flow design parameter.

~~**S-HYD-1**~~
09-HYD-1(b) The storm drain system for the northern system, as incorporated into the engineered design for the proposed future entrance road, shall be designed to adequately accommodate ~~100-year~~ 25-year event peak bulked flows through the ~~access road culvert system~~ design of the road and the incorporated culvert system.

Mitigation Measures. Mitigation measures 2009-HYD-1(a-b) would help to mitigate impacts discussed above.

Significance After Mitigation. With implementation of the above mitigation measures, impacts would be reduced to a less than significant level.

09-Impact HYD-2 **The proposed construction of a new earthen levee north of Long Grade Canyon Creek will increase flood water storage capacity, reduce flooding impacts from Long Grade Canyon Creek, and add 10 acres of wetlands to this segment of Long Grade Canyon Creek. This is considered a Class IV *beneficial impact.***

The segment of Long Grade Canyon Creek adjacent the campus is confined by a levee system, but is proposed for upgrade through the construction of a new 100-year flood protection levee that will contain the 100-year flood within Long Grade Canyon Creek rather than overflowing the northerly bank as in the existing condition. The new levee is proposed for construction upland of the existing northerly levee, and portions of the existing northerly levee will be removed creating the potential for additional channel flows and storage areas that will be used to create an additional 10 acres of wetlands(as discussed in Section 4.3 *Biological Resources*). Moreover, the widened channel system is estimated to accommodate an additional 10-acre feet of water storage, resulting in reduced downstream discharges under storm events that are less than the 100-year flow.

The proposed design will reduce downstream flooding effects by increasing storage and will protect the proposed future playfields and west parking lot from flooding from Long Grade Canyon Creek.

Mitigation Measures. Because Impact 2009-HYD-2 would be beneficial to the campus by alleviating flooding from Long Grade Canyon Creek and adding approximately 10 acres of wetlands between the existing channel and the proposed new earthen levee, no mitigation measures are required.

Significance After Mitigation. The impact is beneficial without mitigation.

09-Impact HYD-3 **The proposed construction of lighting poles, a locker room facility and bleachers or risers within the area bounded by the primary access road, Calleguas Creek and Long Grade Canyon Creek would be subject to flooding during storm events that would exceed a 25-year flow. Construction of these improvements within the 100-year floodplain could result in loss of property or exacerbation of downstream flooding. This is a Class II, *significant but mitigable* impact.**

Construction of lighting poles, a locker room facility and bleachers or risers within the new access road area has the potential to create a situation where structures could be loosened by flood flows and discharged to the Calleguas Creek waterway if not properly engineered. No structures for human habitation are proposed, and facilities such as a locker room would only be used during athletic events, which are not likely to coincide with storm events. Therefore, no adverse effects to health or safety are anticipated. Nevertheless, flooding could loosen structures or fixtures not properly engineered and result in discharge of a fixture to the Calleguas Creek waterway, which could exacerbate flooding. This is a significant impact.

Mitigation Measures. The following mitigation measure is necessary to reduce the potential for adverse effects to a level that is less than significant.

09-HYD-2 Locker facilities, bleachers or risers, and lighting poles shall be designed and engineered to withstand a 100-year flood flow, or shall be elevated above the 100-year floodplain.

Significance After Mitigation. The impact would be less than significant with implementation of mitigation measure 09-HYD-2.

c. Cumulative Impacts. No development is currently proposed in the watersheds upstream of the Campus Master Plan area, and given the existing land use designations and the County's Guidelines for Orderly Development, no long term changes are anticipated. Therefore, no cumulative effects to the local watersheds are anticipated.

Existing development and future growth within the Calleguas Creek Watershed could result in decreased water quality and continued flooding and erosional problems along this drainage. As previously stated, watershed planning efforts are being directed at resolving the current problems that exist in this drainage. Overall, cumulative impacts are the same as those described for the 1998 FEIR, 2000 SEIR, and 2004 SEIR with the significance of cumulative effects dependent on the success of continued watershed protection planning efforts and effective implementation of water control requirements.

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