HYDROLOGY AND WATER QUALITY

SUMMARY

Implementation of the proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.

Implementation of the proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not result in substantial erosion or siltation onsite or offsite.

Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite.

Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff.

Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not impede or redirect flood flows. The proposed project would be located in an existing flood hazard zone but would remove the development area from the flood hazard zone and reduce the release of pollutants due to project inundation.

Implementation of the proposed project would conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

INTRODUCTION

The following analysis is based upon the following reports and references:

- *Preliminary Drainage Study for Camarillo Springs Golf Course for Tentative Tract Map No. 6016, City of Camarillo, California* (Preliminary Drainage Study), prepared by Encompass Consulting Group, August 26, 2019.
- *Ventura Countywide Stormwater Quality Program Post-Construction Stormwater Management Plan (PCSMP) for Camarillo Springs TTM 6016 (SW#0034), Parcel #234-004-0-59*, prepared by Encompass Consulting Group. Approved March 5, 2019 (Revised June 2020).
- *Camarillo Springs Golf Course FEMA Conditional Letter of Map Revision (CLOMR)*, prepared by Pacific Advanced Civil Engineering, Inc., April 2019.
- *Camarillo Springs Golf Course Master Drainage Plan and Floodplain Analysis* (Master Drainage Plan), prepared by Pacific Advanced Civil Engineering, Inc., September 2020.
- *City of Camarillo Safety Element 2013*, prepared by RBF Consulting, adopted May 8, 2013.

The City of Camarillo has independently reviewed and allowed for public review the information presented in the Preliminary Drainage Study, PCSMP, CLOMR, and Master Drainage Plan. A copy of the Preliminary Drainage Study is provided as Appendix O to this EIR, the PCSMP is provided as Appendix P, the CLOMR is provided as Appendix Q, and the Master Drainage Plan is provided as Appendix R.

While the Federal Emergency Management Agency (FEMA) and the Ventura County Watershed Protection District (VCWPD) have performed technical feasibility reviews of the technical reports to date, their involvement in the final determination of the project's proposed revision to the flood hazard areas is not completed. The CLOMR application material was reviewed by City staff to verify it met the general requirements for submittal to FEMA. City requirements related to stormwater hydrology, hydraulics, drainage and flooding must be met through the entitlement, design review and construction processes before a final determination can be made by FEMA to issue a final Letter of Map Revision (LOMR) which effectuates any modifications to the flood zone. Any possible removal of properties from a Special Flood Hazard Area floodplain can happen only if FEMA revises the flood maps with a LOMR, which can only happen when FEMA gives final determination and approval that the grading and improvements identified in the FEMA approved CLOMR have been completed with verification by the City. An outstanding FEMA requirement before for issuance of the CLOMR is for the City (in its role as floodplain administrator) to publish a public notice of the development's intent to modify the floodway/FIRM map. The City will not publish this public notice until after the project has received full entitlement approval by City Council including conditions of approval specific to stormwater hydrology, hydraulics, and drainage. If any proposed buildings, currently shown on the proposed Tentative Map within a fault hazard study zone, are relocated to be within a FEMA 100-year floodplain, then the Master Drainage Plan/Floodplain Analysis must be updated along with the CLOMR.

The project applicant has also submitted hydrology and hydraulic modeling and analysis to the VCWPD for review relative to Conejo Creek, a jurisdictional channel of the VCWPD. Further detailed hydrology and hydraulic calculations and modeling will be required as part of the review of the specific design of the project, and prior to any associated approvals by the VCWPD, FEMA and the City.

ENVIRONMENTAL SETTING

Regional and Local Watershed

Camarillo Springs Golf Course is located within the local 1,080-acre Camarillo Springs Creek watershed, tributary to the 48,112-acre Conejo Creek regional watershed, which is part of the larger Calleguas Creek regional watershed illustrated in Figure 5.9-1.

Floodplain

Portions of the golf course and adjacent areas are located within a 100-year Federal Emergency Management Agency (FEMA) floodplain resulting primarily from overbank flow from Conejo Creek but is also affected by tributary runoff flowing through the golf course from the local Camarillo Springs Creek watershed. The existing FEMA floodplain is illustrated in Figure 5.9-2. As shown, there are approximately 154 existing mobile homes located within the existing 100-year FEMA floodplain to the south and southwest of the golf course. The existing peak flood depths are illustrated in Figure 5.9-3.

Groundwater

As discussed in the Geology and Soils section of this EIR, groundwater was encountered in a previous, adjacent geotechnical investigation at an elevation of about 107 feet. However, the PCSMP concludes that the groundwater levels at the site are high and there is no applicable place for infiltration.

The golf course is irrigated by private water from existing wells located adjacent to Conejo Creek along the westerly edge of the golf course - south area of the project site.

Regulatory Setting

Federal Clean Water Act

The Federal Water Pollution Control Act (commonly known as the Clean Water Act [CWA]) requires states to conduct water quality assessments of water resources. These assessments are used to identify water bodies that do not meet Federal water quality standards, and which are placed on a list of impaired waters pursuant to Section 303(d) of the CWA. In 1972, the CWA was amended to require National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants to "waters of the U.S." from any point source. In 1987, the CWA was amended again to require that the U.S. Environmental

Protection Agency (USEPA) establish regulations for permitting under the NPDES permit program of municipal and industrial storm water discharges. On November 16, 1990, the USEPA published final regulations for storm water discharges associated with industrial activity, for construction activities on five acres or more, and from large municipal separate storm sewer systems (MS4). An MS4 is a conveyance or system of conveyances, including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains. MS4s are owned or operated by a public body that has jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes. The MS4s are only designated or used for collecting or conveying storm water (i.e., not wastewater or combined sewage). In 1998, individual NPDES permits were required for storm water discharges associated with industrial activities. In 1999, regulations were adopted to address storm water discharges from small MS4s and construction sites that are one acre or more.

In addition, the CWA requires states to adopt water quality standards for water bodies and have those standards approved by the USEPA. Water quality standards consist of designated beneficial uses for a water body (e.g., wildlife habitat, agricultural supply, fishing), along with the water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of constituents—such as lead, suspended sediment, and fecal coliform bacteria—or narrative statements that represent the quality of water that supports a particular use. Because California has not established a complete list of acceptable water quality criteria, the USEPA established numeric criteria for priority toxic pollutants in the form of the California Toxics Rule (CTR) (see 40 *Code of Federal Regulations* [CFR] 131.38).

California Water Code

The California Water Code is the principal State law regulating water quality in California. The other codes mentioned contain water quality provisions that require compliance. The CWA places the primary responsibly for the control of water pollution and for planning the development and use of water resources with the states, although it does establish certain guidelines for states to follow in developing their programs. California's primary statute governing water quality and water pollution issues is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act) (California Water Code, Division 7). The Porter-Cologne Act establishes waste discharge requirements, water quality control planning and monitoring, enforcement of discharge requirements, and ground and surface water quality objectives. It also prevents waste and unreasonable use of water, and it adjudicates water rights. It directs each Regional Water Quality Control Board (RWQCB) to develop a Water Quality Control Plan (Basin Plan) for all areas within its region. The Basin Plan serves as the basis for each RWQCB's regulatory programs. The City of Camarillo area is located within the purview of the Los Angeles RWQCB (Region 4), and must comply with applicable elements of the region's Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (discussed below), the Porter-Cologne Water Quality Control Act, and the CWA. Following is a discussion of water quality regulations particularly relevant to the proposed project.

INSERT Figure 5.9-1 - Regional and Local Watershed Hydrology Map

11 x 17

INSERT Figure 5.9-2 - Existing FEMA Floodplain

11 x 17

INSERT Figure 5.9-3 - Existing Conditions Peak Flow Depth (100-Year)

11 x 17

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Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties

The Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (Basin Plan) is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan: (i) identifies beneficial uses for surface and ground waters, (ii) includes the narrative and numerical water quality objectives that must be attained or maintained to protect the designated beneficial uses and conform to the State's anti-degradation policy, and (iii) describes implementation programs and other actions that are necessary to achieve the water quality objectives established in the Basin Plan. In combination, beneficial uses and their corresponding water quality objectives are called Water Quality Standards.

Beneficial uses form the cornerstone of water quality protection under the Basin Plan. Twenty-four beneficial uses in the Region are identified in the Basin Plan. The definitions of the beneficial uses applicable to the proposed project are as follows:

Municipal and Domestic Supply (MUN): Uses of water for community, military, municipal, or individual water supply systems including, but not limited to, drinking water supply.

Groundwater Recharge (GWR): Uses of water for natural or artificial recharge of groundwater for purposes including, but not limited to, future extraction, maintaining water quality, or halting of saltwater intrusion into freshwater aquifers.

Water Contact Recreation (REC-1): Uses of water for recreational activities involving bodily contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

Non-Contact Water Recreation (REC-2): Uses of water for recreational activities involving proximity to water, but not normally involving bodily contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Warm Freshwater Habitat (WARM): Uses of water that support warm water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation habitats, and fish and wildlife habitats (including invertebrates).

Wetland Habitat (WET): Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.

Wildlife Habitat (WILD): Uses of water that support wildlife habitat including, but not limited to, preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife water.

National Pollutant Discharge Elimination System Municipal Construction General Permit

As authorized by the CWA, the National Pollutant Discharge Elimination System (NPDES) Permit Program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Examples of pollutants include, but are not limited to, rock, sand, dirt, and agricultural, industrial, and municipal waste discharged into waters of the United States (see 40 CFR 122.2).

Pursuant to Section 402(p) of the CWA, the State Water Resources Control Board (SWRCB) has issued a statewide general NPDES Permit for storm water discharges from construction sites ([NPDES No. CAS000002] Water Quality Order 2009-0009-DWQ as amended by Orders 2010-0014-DWQ and 2012-0007-DWQ). Under this Construction General Permit, storm water discharges from construction sites with a disturbed area of one acre or more are required to either obtain individual NPDES permits for storm water discharges or to be covered by the Construction General Permit. Coverage under the Construction General Permit is accomplished by determining the risk level of the construction site and by preparing a Storm Water Pollution Prevention Plan (SWPPP) that includes a site evaluation and assessment, best management practices (BMPs) to be implemented at the construction site, and an inspection program. The SWPPP should also outline the monitoring and sampling program to verify compliance with discharge Numeric Action Levels (NALs) according to the Risk Level for the site, as set by the Construction General Permit. The primary objective of the SWPPP is to ensure that the responsible party properly construct, implement, and maintain BMPs to reduce or eliminate pollutants in storm water discharges and authorized non-storm water discharges from the construction site. Permit Registration Documents (SWPPP, Notice of Intent, and other documents), as well as annual reports, Notice of Terminations, and NAL exceedance reports, must be electronically submitted to the SWRCB and the permit fee mailed to the SWRCB for Construction General Permit coverage.

Ventura County Municipal Separate Storm Sewer System Permit

The Ventura County Watershed Protection District, County of Ventura, cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, San Buenaventura (Ventura), Santa Paula, Simi Valley and Thousand Oaks have joined together to form the Ventura Countywide Storm Water Quality Management Program to discharge wastes. Together, they are parties to the Ventura County Municipal Separate Storm Sewer System Permit (CAS004002, Order R4-2010-0108) approved by the Los Angeles RWQCB.

The objective of CAS004002 is to ensure that discharges from the MS4 in Ventura County comply with water quality standards, including protecting the beneficial uses of receiving waters that are identified on the State Water Resources Control Board's current 303D list of impairments. The current 303D list of

impairments for the downstream waterbody (Conejo Creek/Calleguas Creek) to this project include, bacteria, salts, metals, trash, nutrients, pesticides, PCBs and sediment. To meet this objective, CAS004002 requires that BMPs will be implemented to reduce the discharge of pollutants in storm water to the maximum extent practicable and achieve water quality objectives and standards. The implementation of measures set forth in CAS0040028 and CAS004002 are reasonably expected to reduce the discharge of pollutants conveyed in storm water discharges into receiving waters, and to meet the total maximum daily load (TMDL) waste load allocation (WLAs) for discharges from MS4s that have been adopted by the Regional Water Board.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G to the State CEQA Guidelines, a project could have a potentially significant impact on hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation onsite or offsite.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows.
- Be located in a flood hazard zone and risk the release of pollutants due to project inundation.
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

PROJECT IMPACTS AND MITIGATION MEASURES

Water Quality

Threshold: Would the proposed project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Impact: Implementation of the proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.

Impact Analysis

Construction-Related Impacts

Implementation of the proposed project would involve site preparation and construction of the proposed buildings and associated infrastructure. Since development of the proposed project would include grading of more than one acre, it would require a General Construction Activity Storm Water Permit from the SWRCB prior to the start of construction. The NPDES requires that a Notice of Intent (NOI) be filed with the SWRCB. By filing an NOI, the project developer agrees to the conditions outlined in the Construction General Permit. One of the conditions of the General Permit is the development and the implementation of an SWPPP. The SWPPP identifies which structural and nonstructural BMPs will be implemented, such as sandbag barriers, temporary desilting basins near inlets, gravel driveways, dust controls, employee training, and general good housekeeping practices. With implementation of the applicable grading and building permit requirements and the application of BMPs specifically designed to minimize construction-related water quality impacts, the construction of the proposed project would not violate any water quality standards or waste discharge requirements. Therefore, impacts from construction activities would be less than significant.

Operational Impacts

The proposed project would be subject to the requirements of the Ventura County Municipal Separate Storm Sewer System Permit (CAS004002) and related requirements of the Ventura County Technical Guidance Manual for Stormwater Quality Control Measures (TGM) that are in effect at the time of building development.

Compliance with all applicable federal, State, and local regulations, Code requirements, and permit provisions would ensure that the proposed project would not violate any water quality standards or waste discharge requirements and the impact of the project would be less than significant.

The development also includes a third 48-inch pipe along the northerly tract boundary to serve as a pass-thru for storm water flows from the golf course driving range along Ridge View Street. As such, this flow is not subject to water quality treatment standards.

Groundwater Supplies

Threshold: Would the proposed project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Impact: Implementation of the proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Impact Analysis

As discussed previously, the groundwater levels at the site are high and there is no applicable place for infiltration. Therefore, the proposed project would not interfere substantially with groundwater recharge.

As discussed in the Utilities and Services Systems section of this EIR, a Water Study has been prepared, and approved by the Camrosa Water District, that demonstrates the projected Camrosa water supply is adequate to meet the domestic water demand of the project. There would be no increased consumption of groundwater for the project's domestic water supply.

The golf course is irrigated by private water from two existing wells located adjacent to Conejo Creek along the westerly edge of the golf course - south area of the project site. Development of the residential area would require a reconfiguration and update of the existing golf course. All existing cart paths, existing ponds, and other golf features (fairways, tees, greens, etc.) would be removed and redesigned as a 12-hole golf course. The reduction of golf course area would reduce the amount of groundwater that is required to irrigate the property.

Therefore, the proposed project would have a less than significant impact on groundwater supplies.

Erosion and Siltation

Threshold: Would the proposed project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation onsite or offsite?

Impact: Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not result in substantial erosion or siltation onsite or offsite.

Impact Analysis

Construction-Related Impacts

As discussed previously, the SWPPP required for project construction activities will include structural and nonstructural BMPs for runoff control, sediment control, erosion control, and housekeeping to ensure that construction-related water quality impacts resulting from soil erosion would be reduced to a less than significant level. These BMPs may include, but would not be limited to, perimeter controls such as silt fences and/or sandbag barriers, installation of sediment trapping devises (e.g., straw wattles, hay bales, gravel bags), temporary desilting basins and/or check dams near inlets, fiber rolls, soil stabilization (e.g., hydroseed, soil binders), protection of steep slopes, covered stockpiles, gravel driveways, dust controls, employee training, and general good housekeeping practices. Required elements of a SWPPP include: (a) site description addressing the elements and characteristics specific to the site; (2) descriptions of BMPs for erosion and sediment controls; (3) BMPs for waste handling and disposal; (4) implementation of approved local plans; (5) proposed post-construction requirements; and (6) non-stormwater management. Routine inspections would be performed of all SWPPP measures and control practices being used at the site, including inspections before and after storm events. In addition, the City's grading and building permit process further ensures that drainage design will meet the City's requirements relating to drainage and erosion control. With implementation of the applicable grading and building permit requirements, and the application of BMPs specifically designed to minimize construction-related water quality impacts, the construction of the proposed project would not cause substantial erosion or siltation onsite or offsite. Therefore, potential erosion and/or siltation impacts related to project construction would be less than significant.

Operational Impacts

Regarding operational impacts, implementation of the proposed project could substantially alter the existing drainage pattern of the site through a change in site grading, the addition of impervious surfaces (as discussed in detail below), and the project's outflow into an existing open channel. As described in the Project Description, the proposed development would consist of a maintained golf course and residential area. The proposed design incorporates a drainage system that would divide the flow from the upper Camarillo springs watershed so that some of the flow would be conveyed through a large bypass culvert directly to Conejo Creek, and some of the flow would be diverted to the interior lake for storage. (See Figure 5.9-5.) To accommodate potential sediment and debris, the proposed design includes multiple debris basins upstream of the proposed bypass culvert inlet, and a trash rack to stop floating debris from entering the culvert. Detailed design of the bypass culvert outlet(s) is dependent upon final design and final grading. However, based upon all information currently available, the culvert's outlet into the existing channel is not anticipated to result in erosion or siltation, given that during final design, the detailed design of the pipe outlet(s) will have to comply with all existing water quality and control measures in effect. Further, any impacts of erosion or siltation on biological resources within jurisdictional

areas would be addressed and reduced to a less than significant level through implementation of mitigation measure BIO-12, and the project's sections 401 and 404 permitting under the Clean Water Act, and Section 1602 of the California Fish and Game Code, if applicable. Further, the SWPPP, described above, would include and identify post-construction requirements. Therefore, the proposed project's operation is expected to result in less than significant erosion or siltation impacts.

Flooding

Threshold: Would the proposed project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite?

Impact: Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite.

Impact Analysis

The project flood protection system is proposed to consist of elevating the proposed 31-acre residential development area to be a flood protection barrier along the northern boundary of the project site. The project area, as well as the area outside of and immediately south of the project that includes 154 existing residences (residential structures), is proposed to be protected from the Conejo Creek floodplain. The raising of the residential development site results in a reduction of about 389 acre-feet of the floodplain capacity in the overbank area of Conejo Creek. To manage the removed storage volume, an on-site system is proposed that provides flood storage of approximately 90 acre-feet at the lake system located within the main golf course area and 23 acre-feet in the east basin (not counting the storage available for sediment volume). An additional 302 acre-feet of storage volume would be created in the southern area of the golf course after the excavation of soil materials from this area for transfer to, and fill for, the proposed residential area. The proposed design incorporates a drainage system that would divide the flow from the upper Camarillo Springs watershed so that some of the flow will be conveyed through a large bypass culvert directly to Conejo Creek, and some of the flow will be diverted to the interior lake for storage. This bypass culvert is proposed to limit the flow directed to the existing northerly golf lake area, and store that water below the 114 elevation, which would keep flooding out of the existing residential lots. This flood storage area would be drained when the Conejo Creek flood level is below the interim flood level of 114 elevation. The basin drainage time will be 24 hrs or meet acceptable design performance criteria when analyzed with a detailed dynamic routing per County standards. This will be completed in the final design phase of the drainage system. Additionally, the bypass culvert has been designed with multiple

redundant features to eliminate the possibility of the culvert getting clogged (e.g., debris/sediment basins, low-velocity gradient, and debris and blockage inspections and removal).

Regional Hydrology - Conejo Creek

There have been multiple hydrologic studies of Conejo Creek using various approaches to hydrologic parameters. The studies and the results were reviewed and compared to select the results used in the Master Drainage Plan analysis.

US Army Corps of Engineers: In February 2003, The United States Army Corps of Engineers (USACOE), in cooperation with the Ventura County Watershed Protection District (VCWPD), prepared a comprehensive study of Calleguas Creek, which included its tributaries – notably Conejo Creek. The study, entitled *Calleguas Creek Watershed Feasibility Study*, provided rainfall-runoff models for estimating peak flowrates and hydrographs at key locations, including just upstream of the proposed project development at the Highway 101 crossing of Conejo Creek. The study used the Hydrologic Engineering Center's Hydraulic Modeling System (HEC-HMS) with extensive land use, precipitation, streamflow, and soil data.

Ventura County Watershed Protection District Study: In March 2003, a countywide study, initiated by the Federal Emergency Management Agency (FEMA) and in cooperation with the USACOE, was prepared by the VCWPD entitled *Calleguas Creek Watershed Hydrology Study*. The study included the County's VCRat (Modified Rational Method) peak flowrates and hydrographs for the entire Calleguas Creek Basin.

FEMA Flood Insurance Study (FIS): The effective Flood Insurance Study, dated April 2018, shows peak flowrates for Conejo Creek which are lower than those obtained from the USACOE and VCPWD Countywide studies.

FEMA Conejo Creek Model: A FEMA River Analysis System (HEC-RAS) model of Conejo Creek through Camarillo Springs, uses flowrates from the 2003 VCWPD study, adjusted with aerial reduction factors from curves generated by the VCWPD. That model was the FEMA effective hydraulic model prior to a 2015 Letter of Map Revision (LOMR) (see below).

Conejo Creek 2015 LOMR: The hydraulic model of Conejo Creek in the project area was updated as part of an approved 2015 LOMR. For that LOMR, the VCRat 100-year Conejo Creek hydrologic model was revised, following guidance from VCWPD staff, to include volume scaling (hydrograph fattening). The model for that LOMR became the FEMA effective model for the study reach of Conejo Creek. The hydrology used in that model is the primary source for the hydrology used in the project Master Drainage Plan.

Table 5.9-1, labeled 100-year Flowrates, provides a basis of comparison between the effective flow rates and the study flowrates of the hydrologic studies discussed above.

TABLE 5.9-1: 100-YEAR FLOWRATES

	USACOE	VCWPD	FEMA FIS	FEMA Conejo Creek Model	Current Effective FEMA (VCRat)
100-Year Peak Flowrate	22,500 cfs	22,987 cfs	22,000 cfs	23,070 cfs	23,097 cfs[1]

cfs = cubic feet per second.

[1] The value uses for the project Master Drainage Plan.

Source of table data: Pacific Advanced Civil Engineering, Inc., August 2020.

Local Hydrology

The project Master Drainage Plan hydraulic analysis of Conejo Creek uses a main Conejo Creek channel flow hydrograph, introduced at the upstream extent of the hydraulic models, and multiple lateral inflow hydrographs, introduced at locations along the study reach. Most of the hydrographs are obtained from the FEMA effective model. In proposed conditions, the Camarillo Springs Creek watershed will be divided into three primary drainage areas, as shown in Figure 5.9-4, labeled Proposed Condition Drainage Map.

Design Hydrology for Regional Floodplain Analysis

Hydrographs for the local lateral inflows to Conejo Creek are obtained from the FEMA effective HEC-RAS (one dimensional) model. The hydrographs include flows from Camarillo Springs Creek, the East Camarillo Drain, the Oak Grove Channel, and Upland Road Drain.

In the Master Drainage Plan, the Conejo Creek hydrograph is modified in the proposed conditions modeling to account for the planned drainage system and interior lake storage. The proposed conditions inflow to Conejo Creek, at Ridge View Street, is scaled by the ratio of original runoff volume minus lake storage, divided by the original runoff volume. The lake storage volume is calculated by analyzing the proposed conditions flood protection design using XPSWMM hydraulic routing software.

Project Site Hydrology

As shown in Figure 5.9-5, labeled Proposed Drainage Master Plan, there are three main areas that would drain through the project area to Conejo Creek: the area tributary to the bypass culvert, the area directly tributary to the lake (South Adjacent Lower Camarillo Springs Creek Watershed and South Project Development), and the area that drains to the north of the lake and golf course (East Adjacent Lower Camarillo Springs Creek Watershed and East Project Development). Peak flowrates and volumes are also noted in Figure 5.9-5.

Camarillo Springs Creek Hydraulic Analysis

The proposed project is designed to create flood protection for the 154 existing residences and new development. A design performance requirement is that the proposed design must preserve the amount of existing Conejo Creek floodplain storage. The proposed project will occupy overbank area where there is approximately 389 acre-feet of existing Conejo Creek 100-year floodplain storage as illustrated in Figure 5.9-6. The proposed project provides compensatory storage consisting of 90 acre-feet of storage in the interior lake, 23 acre-feet in the east basin (not counting the storage available for sediment volume), and increases the floodplain storage on the south golf course area by 302 acre-feet as illustrated in Figure 5.9-7.

The existing conditions floodplain storage on the north golf course area and the south golf course area results from Conejo Creek overbank flow, and so the storage may be analyzed and calculated from the existing conditions Conejo Creek floodplain hydraulic models. The proposed conditions floodplain storage on the south golf course area also results from Conejo Creek overbank flow and may be analyzed and calculated from the proposed conditions Conejo Creek floodplain hydraulic models. The proposed conditions floodplain storage on the project lake results from Camarillo Springs Creek flow that is stored before it can combine with Conejo Creek flow, so the proposed conditions lake storage is not provided by the Conejo Creek floodplain hydraulic models. The proposed conditions interior floodplain and lake storage must be analyzed with a hydraulic routing model of the Camarillo Springs Creek and the proposed drainage system. The analysis was done with an XPSWMM hydraulic routing model.

During the 100-year design storm, with coincident peaks in Conejo Creek, and in Camarillo Springs Creek, the 21-acre lake provides 90 acre-feet of Conejo Creek floodplain storage by surcharging and storing Camarillo Springs Creek flow volume before it can add to the Conejo Creek floodplain volume. The proposed bypass culvert is proposed to limit the flow that is directed to the lake area to a maximum of 90 acre-feet. During the storm, the lake surcharges to a maximum of 114 feet. The two proposed 48-inch pipes at the northwestern corner of the lake area are proposed to return the lake to its normal operating water surface elevation of 107 feet approximately 24 hours after the peak flow in Conejo Creek. The two 48-inch pipes include substantial redundancy /factor of safety in design as a single 36-inch diameter pipe would allow the 90 acre-feet to drain in the required 24 hours (County requirements). Additionally, the proposed bypass culvert has been designed with multiple redundant features to eliminate possibility of the bypass culvert getting clogged. The proposed anti-clog features are as follows:

- Debris/sediment basin with capacity of more than 30 acre-feet located upstream of Camarillo Springs Drive.
- Flow has to pass under Camarillo Springs Drive in the existing golf cart tunnel and passed through an additional debris/flow split basin which would remove additional debris with the screen over the bypass culvert inlet.

INSERT Figure 5.9-4 - Proposed Condition Drainage Map

11 x 17

INSERT Figure 5.9-5 - Proposed Drainage Master Plan

11 x 17

INSERT Figure 5.9-6 - Existing Flood Storage (100-Year)

8.5 x 11

INSERT Figure 5.9-7 - Proposed Flood Storage (100-Year)

8.5 x 11

- The smooth walks and slope (hydraulic gradient) of the bypass culvert creates flow velocity within the bypass culvert that would keep most debris that could get into the culvert in suspension and discharged downstream outside the bypass and into Conejo Creek.

- The 10-foot by six-foot concrete bypass culvert would require periodic inspection to verify no debris or blockage is present and will be removed if necessary.

- The lake and northerly flood storage area is roughly seven acres at elevation 107 and 19 acres at elevation 114. This storage volume of 90 acre-feet plus the additional storage below the lake normal water level (elevation 107 to 104 – for an additional 20 AF) provides a massive storage volume to protect the overflow pipes from the possibility of clogging.

The secondary emergency overflow would be part of the detailed design and final construction plan preparation. Figure 5.9-5 locates the secondary emergency overflow at the "West Basin – Inlet to the Bypass Culvert". The secondary emergency overflow would be directed north out of the proposed west basin and across the entry road, through the golf course parking lot and into the existing driving range (which is connected to the Conejo Creek 100-year floodplain at elevation 118).

It is important to note that there are no elements of the proposed drainage plan that require active operational activity by anyone or anything (pumps, valves, actuators, level controls, etc.). The drainage system is considered "passive" and has multiple redundant safety features as part of the design effort. Operation and maintenance personnel are not required to perform any function for the system to function as designed during a flood event. Maintenance (as is required on every drainage facility) happens before and after the annual rainy season.

The primary diversion for the Camarillo Springs watershed is at the proposed "west basin" and this includes:

- Low flow diversion for small flows to the north lake area for water conservation and lake water supply.

- Primary diversion to by-pass culvert for high flow diversion to Conejo Creek.

- Secondary overflow (gravity surface flow path) to driving range area and Conejo Creek floodplain (emergency overflow in the event of failure of primary system or flows larger than 100-year runoff).

For the outflow from the north lake/golf area with 100-year flood storage to elevation 114.0, the following redundant systems are in place:

- The primary drain for the golf area is required to be a 32-inch diameter pipe and in order to provide a robust and redundant flood control solution the conceptual design for the lake outflow includes two 48-inch diameter pipes. Therefore, one 48-inch pipe could be completely blocked (i.e. fail) and the system would still have flow capacity in the 1.3 to 1.5 times the design requirement.

- The upstream "east basin" and the north lake are designed to provide very large (>50 acre feet) sediment/debris storage area to protect the lake outflow pipes from debris that could clog the pipe. The velocity in the lake / storage area is very low (< 2 fps); therefore, large debris that could clog the outflow pipes could not be transported with such low velocity.

- Finally, in the case of catastrophic failure of the lake outflow system where both pipes are blocked and no flow can leave the lake and the 100-year storm occurred, the result would be a maximum 100-year flood level of 114.0 (the 90 acre-feet of flood water stored in the north lake area is comprised of 48 acre-feet of runoff from the 140-acre watershed to the south of the lake and 42 acre-feet from the low flow diversion from the West Basin). With a subsequent rainfall event and no outflow, the water level could potentially exceed the 114.0-foot flood level. However, the immediate action from the drainage maintenance entity would be to resolve the blocked pipe issue and in the meantime the low flow from the west basin could be shut off and temporary pumps could be used to lower the water level in the north lake until such time as the pipe blockage could be cleared. This type of catastrophic failure is extremely remote (much less likely than the 1% - 100-year storm rainfall event) and substantial additional redundant safety features have been incorporated into the design to further minimize any potential for such a failure. And all that said, it is important to recognize that without the project improvements to protect the 154 existing residential structures the likelihood of flooding damage is much more likely as the residences are currently below the 118.0 Conejo Creek 100-year flood level.

In regards to the emergency unobstructed surface flow, it is acknowledged that a significant requirement of the project is to provide unobstructed emergency drainage overflow facility to allow any water accumulated within the project site or existing Camarillo Springs developments to flow downstream without causing any impacts to any structures. This is being accomplished by including in the Master Drainage Plan the Secondary Overflow Spillway (emergency overflow) at the west basin and the redundant/oversized outflow pipes at the north lake, as described above.

The project applicant has proposed that the maintenance responsibility of the proposed drainage system (Camarillo Springs Debris Basin, West Basin, Bypass Culvert inlet, outlet and length of the culvert, and two 48-inch diameter outfall pipes (with flap gates) from the existing north lake to Conejo Creek) would be paid for as an annual assessment to the proposed new property owners and be the financial responsibility of the new property owners and not the City or the existing residents. The maintenance entity would be the homeowners association (HOA). Details of the drainage system maintenance plan and easements will be finalized with completion of the final design and drainage improvement plans.

Figures 5.9-8 through 5.9-10 show that the 154 existing residences (residential structures) would be removed from the 100-year floodplain. A total of 127 mobile home lots would be completely removed from the 100-year flood hazard zone. However, because some existing mobile home lots have elevations as low as 110 feet, a portion of 27 lots would remain partially within the 100-year flood zone. Specifically, the 154 mobile home lots within the FEMA 100-year floodplain would be affected as follows:

- There are 89 lots and residential structures in the west area generally adjacent to Margarita Avenue: 62 lots and residential structures would be completely removed from FEMA 100-year flood hazard, 27 lots immediately adjacent to the existing lake have existing ground below elevation 114.0 and, therefore, a portion of the lots would remain in the FEMA 100-year floodplain. Although all 27 lots would have the residential structure removed from the 100-year floodplain, mortgage companies may require flood insurance for these properties.
- There are 65 lots and residential structures in the south area generally adjacent to Irena Avenue: all 65 residential structures and the entire lots would be removed from the FEMA 100-year floodplain.

Conejo Creek Hydraulic Analysis

The Conejo Creek Floodplain hydraulics were analyzed with HEC-RAS two dimensional modeling. The only differences between the existing conditions models and the proposed conditions model are the proposed grading and geometric changes along the north golf course area, the proposed grading and geometric changes along the south golf course area, and the proposed conditions lateral inflow hydrograph from Camarillo Springs Creek modified to reflect revised proposed hydrology, and the proposed drainage system and lake storage.

The existing peak flood flow depths were shown previously in Figure 5.9-3 while the proposed flood flow depths are illustrated in Figure 5.9-11. These flow depth exhibits depict the deepest flow depth that occurs for each HEC-RAS 2D element at any time in the design storm analysis. The flow depth exhibits also show the greatest extents of the surface water during the design storm. As can be seen by comparing the flood depth exhibits for the existing and proposed conditions, the peak flow depths do not change substantially outside of the project site boundary on the properties upstream or downstream of the golf course property, or on the properties west of the golf course property. Any changes to the floodplain extents are not detectable at the FEMA map scale.

Comparing the existing and proposed conditions flow depth exhibits, changes to the flow depths and extents can be seen within the Camarillo Springs project site. The changes within the north golf course area reflect onsite project grading and fill, and also the onsite floodplain storage of flow generated on the local watershed. The exhibits also show the removal of the 100-year floodplain from within the main residential project area and 154 existing mobile homes along the southern edge of the golf course. The comparison also shows the increase in overbank floodplain storage depth on the south golf course area.

The 100-year flow depth differential exhibit, Figure 5.9-12, shows the flood depth changes, proposed conditions depth minus existing conditions depth. The figure shows the substantial depth increases, by design, on the project property on the south golf course area. Very slight increases in the modeled flood depth, less than 0.1 foot, are shown on offsite areas. These slight differences are on the same order of magnitude as the hydraulic model convergence tolerance, and do not comprise reliably expected differences, or actionable impacts.

The existing and proposed conditions flow velocity exhibits, Figure 5.9-13 and Figure 5.9-14, depict the grid averaged velocity at the peak of the hydrographs. The velocity results indicate that there are minor changes between the existing conditions and the proposed conditions.

Comparing the existing and proposed conditions velocity exhibits, the most apparent difference is within the north golf course area, on the golf course property, where the proposed project grading would isolate the area from Conejo Creek flow resulting in a broad expanse of area showing no velocity in proposed conditions.

The flow velocity differential, Figure 5.9-15, depicts small velocity increases on offsite areas. Note that the area with a small increase in velocity extends well upstream U.S. Highway 101 for some distance, where no project impacts to depth or velocity would be expected. This demonstrates the nature of dynamic two dimensional analysis. Dynamic modeling allows oscillation, or ringing, where the results from two models will show result differences that propagate through the model even when the two conditions have only very minor, localized differences.

Even if the differences are a result of oscillations in the models, it is helpful to analyze the increases to check for possible erosion. Figure 5.9-16 shows a similar velocity differential, but only displays any areas where a velocity increase results in a proposed conditions velocity of greater than 4 feet/second, which is a low threshold for possible erosion on earthen channels. The figure shows that the broader offsite area is not realistically impacted by any velocity increases, even if the velocity increases. There are only a few scattered cells that are shown as green but surrounded by large areas of no color. Isolated spots indicate localized, transient model peaks. Such areas do not indicate realistically expected velocity conditions that could cause erosion, or actionable impacts.

In summary, the proposed project development would be protected from the FEMA 100-year floodplain, and 154 existing residences would be removed from the current 100-year FEMA floodplain. The analysis also shows that the proposed project would preserve the amount of existing Conejo Creek floodplain volume. Therefore, the impact of the project on flooding onsite or offsite would be less than significant.

While preliminary flood mitigation analysis and review has been conducted by VCWPD and FEMA, the final flood mitigation plans and revision of the FEMA flood hazard map are subject to the review and approval of detailed engineering plans and hydraulic calculations by the City and further VCWPD and FEMA review and approval as necessary. The final review and approval would occur during plan check after the EIR and development entitlements have been approved.

INSERT Figure 5.9-8 - 100-Year Floodplain Limits for Margarita Avenue Residences With Proposed Drainage Improvements - 1

11 x 17

INSERT Figure 5.9-9 - 100-Year Floodplain Limits for Margarita Avenue Residences With Proposed Drainage Improvements - 2

11 x 17

INSERT Figure 5.9-10 - 100-Year Floodplain Limits for Margarita Avenue and Isabel Avenue With Proposed Drainage Improvements

11 x 17

INSERT Figure 5.9-11 - Proposed Conditions Peak Flood Depth (100-Year)

11 x 17

INSERT Figure 5.9-12 --Flood Depth Differential (100-Year)

11 x 17

INSERT Figure 5.9-13 - Existing Conditions Peak Velocity (100-Year)

11 x 17

INSERT Figure 5.9-14 - Proposed Conditions Peak Velocity (100-Year)

11 x 17

INSERT Figure 5.9-15 - Peak Velocity Differential (100-Year)

11 x 17

INSERT Figure 5.9-16 - 100-Year Velocity Differential - 4 FPS Threshold (100-Year)

11 x 17

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Runoff Water

Threshold: Would the proposed project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff?

Impact: Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff.

Impact Analysis

As discussed above, a design performance requirement is that the proposed project design must preserve the amount of existing Conejo Creek floodplain storage. The proposed project will occupy overbank area where there is approximately 389 acre-feet of existing Conejo Creek floodplain storage as illustrated previously in Figure 5.9-6. The proposed project provides compensatory storage consisting of 90 acre-feet of storage in the interior lake, 23 acre-feet in the east basin (not counting the storage available for sediment volume), and increases the floodplain storage on the south golf course area by 302 acre-feet. Therefore, the project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff. The impact of the project would be less than significant.

Flood Flows

Threshold: Would the proposed project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows?

Impact: Implementation of the proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the addition of impervious surfaces but would not impede or redirect flood flows.

Impact Analysis

As discussed above, the proposed project would remove 154 existing mobile homes from the current FEMA floodplain while preserving the amount of existing Conejo Creek floodplain volume. Therefore, the project would not impede or negatively redirect flood flows. The impact of the project would be less than significant.

Flood Hazards

Threshold: Would the proposed project be located in a flood hazard zone and risk the release of pollutants due to project inundation?

Impact: The proposed project would be located in an existing flood hazard zone but would remove the development area from the flood hazard zone and reduce the release of pollutants due to project inundation.

Impact Analysis

As discussed previously, portions of the golf course and adjacent areas are located within a 100-year FEMA floodplain resulting primarily from overbank flow from Conejo Creek but is also affected by tributary runoff flowing through the golf course from the local Camarillo Springs Creek watershed. In addition, there are approximately 154 mobile homes located within the 100-year FEMA floodplain to the south and southwest of the golf course.

The proposed project would substantially alter the existing drainage pattern of the site or area through a change in site grading and the proposed residential uses would be protected from the FEMA 100-year floodplain, and 154 existing residences would also be removed from the current 100-year FEMA floodplain.[1] No new structures that would store or utilize hazardous materials are proposed within the area of the site that would continue to be within the 100-year floodplain. Therefore, the impact of the project would be less than signifiant.

Water Quality Plans

Threshold: Would the proposed project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Impact: Implementation of the proposed project would conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impact Analysis

The PCSMP has been prepared to demonstrate compliance with the Ventura Countywide Stormwater Quality Program. As discussed previously, there would be no increased consumption of groundwater for the project's domestic water supply and the reduction of golf course area would reduce the amount of groundwater that is required to irrigate the property. The impact of the project would be less than significant.

[1] As discussed previously, 154 existing mobile homes would be removed from the 100-year floodplain but 27 lots Along Margarita Avenue immediately adjacent to the existing lake have existing ground below elevation 114.0 and, therefore, a portion of the lots would remain in the FEMA 100-year floodplain.

CUMULATIVE IMPACTS

Development of the proposed project in combination with other new projects in the City of Camarillo would largely result in further development or redevelopment in an already urbanized area. Development of each related project site would be subject to the development and construction standards that are designed to ensure water quality and hydrological conditions are not adversely affected. All of the related projects would be required to implement BMPs and those that disturb more than one acre would be required to conform to the existing NPDES water quality program. Therefore, cumulative water quality impacts would be less than significant.

UNAVOIDABLE SIGNIFICANT IMPACTS

The proposed project would not create any unavoidable significant impacts to hydrology and water quality.

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