3.6 GEOLOGY AND SOILS

This section describes the existing geologic conditions and analyzes the potential for impacts from geologic and soils hazards to occur through implementation of the Project. Geologic resources consist of all soil, bedrock materials, mineral deposits, important landforms and underlying or regional tectonic features that may create seismic hazards (i.e., earthquake faults). These resources can present hazards or obstacles to new development and may also have scientific and economic value. Paleontological resources (fossils) are also identified as geological resources in the State CEQA Guidelines Appendix G under Geology and Soils. Paleontological resources are most commonly encountered below the ground surface and may be discovered or disturbed during Project implementation.

3.6.1 Environmental Setting

3.6.1.1 Regional Setting

The City is in a geologically complex and seismically active region within the Coast Range Geomorphic Province. This region extends along the coastline from central California to Oregon and consists of a series of northwest-southeast trending mountain ranges and intervening valleys that are generally separated by faults. The eastern boundary of the Coast Range Geomorphic Province is the Central Valley, the western boundary is offshore in the Pacific Ocean, and the Santa Ynez Valley is the southern boundary. The geology of the province is dominated by long surface blocks adjacent to major faults that run approximately parallel to the San Andreas Fault. Typically, the layers within each of these blocks have been intensely folded and faulted (Dibblee 2004).

The Project site is located east of and adjacent to the Irish Hills at the southern flank of the Santa Lucia Mountain Range in the San Luis Obispo Valley, a northeast-southwest trending stream valley that is carved into underlying bedrock and filled with alluvial sediments. Much of the region is situated within low-lying valley areas that are predominantly underlain by varying thicknesses of recent-age alluvium. The surrounding hills are comprised of the Franciscan and Monterey Formations and Quaternary-aged non-marine terrace deposits. The alluvium is derived from the surrounding upland areas and is composed primarily of clayey sands and gravels (GeoSolutions, Inc. 2017; refer to

Appendix G). The area historically supported chromite and chromium mining activities, though all mining ceased more than 50 years ago.

3.6.1.2 Site Topography

The Project site consists of level to rolling topography with natural drainages that rise to the steep, rocky Irish Hills in the southwestern portion of the site. The site is "U" shaped and generally aligned in an east-west orientation. Onsite topography rises gently from an average surface elevation of approximately 110 feet above mean sea level (msl) in the east to over 300 feet above msl in the southwest. The southern portion of the site consists of a relatively level terrace with a surface elevation of approximately 200 feet above msl. Within the proposed Villaggio area of the Project site, slopes range from 0 to 75 percent, but are more commonly between 15 and 30 percent. Within the Madonna Froom Ranch portion of site, slopes range from 0 to 30 percent, though slopes are most commonly less than 15 percent.

The Project site consists of level topography in the lower elevations which gradually rises up to the base of the Irish Hills. Slopes generally range between 0 and 30 percent, while some steeper areas contain up to 75 percent slopes.

3.6.1.3 Project Site Soils and Formational Units

The Project site lies within Jurassic and Cretaceous-age geology (205-63 million years before present), primarily consisting of Franciscan Complex formational units overlain by alluvial soil material. The Franciscan Complex rock at the site varies from fresh to very intensely weathered, very hard to very soft, and massive to slightly bedded. Additional soil types at the site include fill, colluvium, landslide deposits, stream deposits, and alluvial deposits (Appendix G).

The Project site generally contains surface soils comprised of fine-grained and nearly impervious material with slow to very slow infiltration rates with high runoff potential, soils with high water tables, and soils that are shallow over nearly impervious material (such as the above-described Franciscan Complex rock) (Table 3.6-1). Surface materials

in the eastern, lower elevations of the site generally consists of soft, wet clay. The soil texture and colors are very dark grayish brown sandy clay and dark gray clay at various depths depending on location. Underlying the surface soils of the western upper-elevation areas are formational units of the Franciscan Complex. Localized hard to very hard rock conditions (chert, serpentite) are beneath top soils in the upper-elevation areas. Per subsurface investigations within the Project site, groundwater within the eastern lower portions of the site adjacent to the Calle Joaquin wetlands is generally encountered at an approximate depth of 1.5 to 4.0 feet below ground surface (bgs). In the northeastern portions of the site, near Irish Hills Plaza, groundwater was not encountered at a depth of 10 feet bgs. Groundwater was not observed in the western upper-elevations of the site though natural springs were mapped in the Upper Terrace of Villaggio (Appendix G).

Table 3.6-1. Project Site Soils Characterization

Soil Symbol	Soil Name	Acreages in Project Site	Slope %	Surface Runoff Potential
Specific Plan Area				
127	Cropley clay	43.8 (40.3%)	0 to 2	Medium
130	Diablo and Cibo clays	16.0 (14.7%)	9 to 15	Very high
131	Diablo and Cibo clays	7.3 (6.7%)	15 to 30	Very high
162	Los Osos – Diablo complex	1.8 (1.6%)	5 to 9	Very high
164	Los Osos – Diablo complex	14.5 (13.3%)	15 to 30	Very high
183	Obispo – Rock outcrop complex	21.8 (20.0%)	15 to 75	Very high
221	Xerets – Xerolls – Urban land complex	0.7 (0.6%)	0 to 15	Very high
300	Corducci – Typic Xerofluvents	2.9 (2.7%)	0 to 5	Very low
Proposed Stormwater Detention Basin Area				
127	Cropley clay	0.1 (1.8%)	0 to 2	Medium
197	Salinas silty clay loam	3.7 (62.2%)	0 to 2	Negligible
221	Xerets – Xerolls – Urban land complex	2.2 (36.0%)	0 to 15	Very high

Source: NRCS 2018.

3.6.1.4 Geologic Hazards

Regional Faulting, Seismicity, and Earthquakes

The City lies in a seismically active region of California. The California Central Coast has a history of damaging earthquakes, primarily associated with the San Andreas Fault. In addition, there have been a number of magnitude 5.0 to 6.5 earthquakes on other faults which have also affected large portions of the Central Coast. Recent events include the 6.5-

magnitude San Simeon Earthquake in December 2003 and the 6.0-magnitude Parkfield Earthquake in September 2004 (Earthquake Track 2018). Earthquake magnitudes are quantified using the Richter scale, which is a logarithmic scale whereby each whole number increase in Richter magnitude represents a tenfold increase in the amplitude of the seismic wave generated by an earthquake. For example, at the same distance from a fault, the shaking during a 5.0-magnitude earthquake will be 10 times larger than a 4.0-magnitude earthquake while the amount of energy released would increase by a factor of 32. Earthquakes of Richter magnitude 6.0 to 6.9 are classified as moderate, those between 7.0 and 7.9 are classified as major, and those of 8.0 or more are classified as great.

There are several faults in the vicinity of the Project site that are capable of producing strong ground motion, including the onshore Los Osos and San Andreas faults, and the offshore Hosgri Fault. These active fault zones are considered to have a high probability of producing a major earthquake within an average human lifespan. With respect to seismically induced ground shaking, the areas with the highest risk are those located in valleys where relatively thick sections of unconsolidated alluvium have accumulated (City of San Luis Obispo 2000). During an earthquake along any of the proximate faults, seismic shaking would be anticipated to occur in the vicinity of the Project.

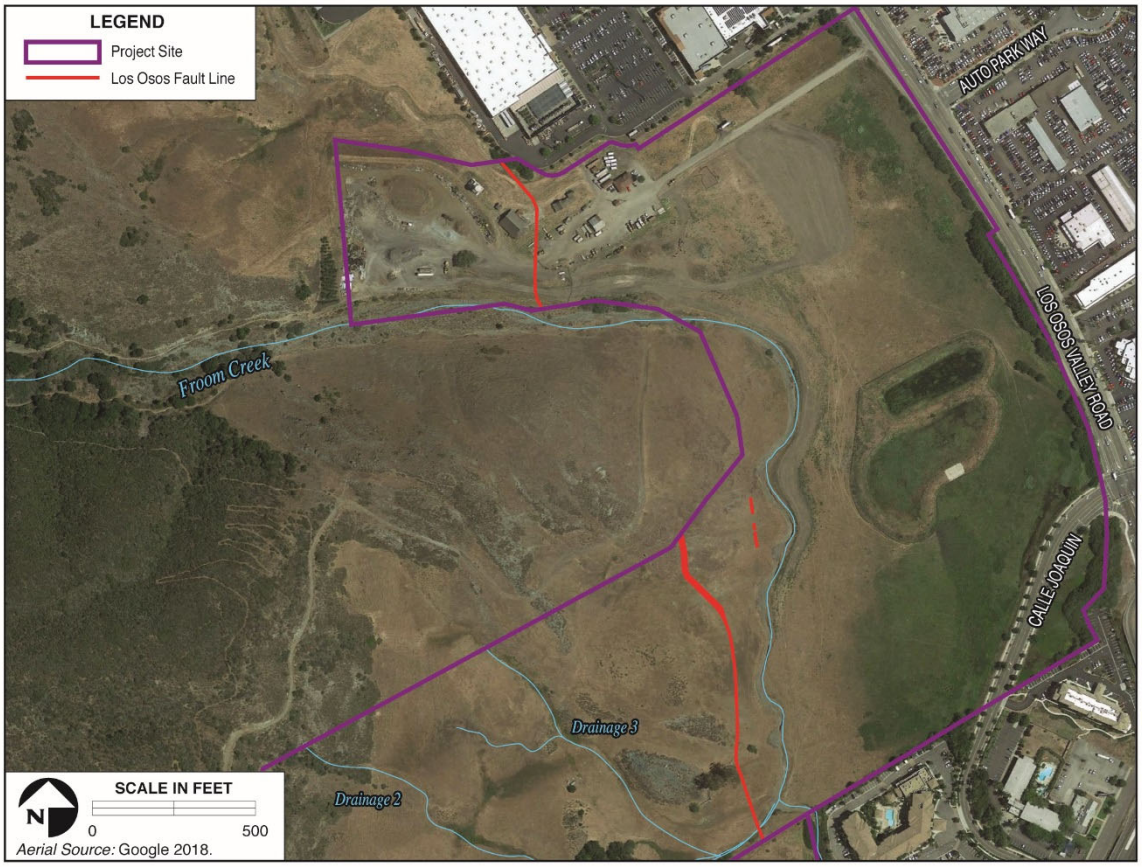
A list of the seismic parameters for active faults most likely to affect the Project site is presented in Table 3.6-2. Based on the maximum probable earthquake magnitude for each active fault, the seismic events that would generate the highest estimated ground accelerations at the site would likely be earthquakes of close to magnitude 7.0 along the Los Osos Fault. Consequent ground acceleration associated with this type of seismic event has the potential to cause severe damage to buildings and infrastructure. Local subsurface conditions such as the presence of unconsolidated, saturated alluvium may intensify seismic shaking or result in other seismic hazards.

Table 3.6-2. Seismic Parameters for Active Faults near the Project Site

Fault	Fault-to-Site Distance (miles)	Maximum Probable Earthquake[1,2] (Richter Magnitude)
Los Osos	1.5	7.0
Hosgri	8	7.5
San Andreas	38	8.0

[1]Maximum Probable Earthquake = the maximum earthquake likely to occur over a 100-year period.
[2]The parameters presented in this table are intended for planning purposes only and should not be used as a basis for design.
Source: Appendix G.

The closest active fault to the Project site is the Los Osos Fault, located west of the City on the south side of the Los Osos Valley. The Los Osos Fault Zone is a 31.1-mile-long, 0.75-mile-wide system of discontinuous fault traces extending from Estero Bay on the north to an intersection with the West Huasna Fault southeast of the City. The full Irish Hills segment is about 10 to 12 miles long and extends from the Pacific Ocean near Los Osos eastward to San Luis Creek, including through the Project site (Figure 3.6-1). A two-mile fault section of the Irish Hills segment west of Laguna Lake and 1.5 miles northwest of the Project site is considered active according to Alquist-Priolo zoning by the State of California (Appendix G). The potential for ground rupture during ground shaking is considered moderate due to the presence of the Los Osos Fault through the Project site, further detailed below.



wood.

Active Fault Lines at the Project Site

FIGURE 3.6-1

Los Osos Fault

While the Project site is not located within the mapped Alquist-Priolo designated Earthquake Fault Zone of the Los Osos Fault, other maps have indicated the Project site is

located within active traces of the Los Osos Fault, approximately 1.5 miles southeast of the designated Alquist-Priolo area. Therefore, a Subsurface Fault Investigation was conducted and a Development Setback Map was prepared (Appendix G) to establish development setbacks from the trace of the Los Osos Fault through the site.

The Los Osos Fault at the site exhibited characteristics of active movement (movement within the last 11,000 years before present or Holocene in age, offset in colluvial sediments), Quaternary age movement (last 2 million years before present), and pre-Quaternary movement (movement prior to 2 million years before present). Additional maps identify the Los Osos Fault through the site as a "Late Quaternary fault", involving displacement during the past 700,000 years. Comparing the faulting characteristics with observed faulting characteristics within fault trenches excavated at the Project site, the site generally shows a southwest-oriented fault that is broken by discontinuous faults, extending first across the northwestern extension of the Project site from near Costco to the Irish Hills Natural Reserve, and continuing again across the southwestern extension of the Project site from the Irish Hills Natural Reserve to the base of the hill below Mountainbrook Church (Appendix G).

Surface Rupture

Surface rupture involves the displacement and cracking of the ground surface along a fault trace. Surface ruptures are visible instances of horizontal or vertical displacement, or a combination of the two, typically confined to a narrow zone along the fault. Surface rupture is more likely to occur in conjunction with active fault segments where earthquakes are large, or where the location of the movement (earthquake hypocenter) is shallow. The Los Osos Fault Zone, located along the southwestern border of the City, is identified as a high rupture hazard to development and facilities in the Los Osos Valley, including the Project site, in the City's General Plan Safety Element (SE).

Liquefaction

The Project site has high groundwater in the southeastern corner which contributes to known liquefaction potential, though the potential to result in liquefaction is low with implementation of geotechnical recommendations.

Liquefaction is a form of earthquake-induced ground failure that occurs primarily in relatively shallow, loose, granular, water-saturated soils. Liquefaction is defined as the transformation of a granular material from a solid state into a liquefied state as a consequence of increased pore pressure, which results in the loss of grain-to-grain contact. Unconsolidated silts, sands, and silty sands are most susceptible to liquefaction, along with areas of high groundwater. Almost any saturated granular soil can induce an increase in pore water pressures when shaken, and subsequently, these excess pore water pressures can lead to liquefaction if the intensity and duration of earthquake shaking are great enough. During large earthquakes in which liquefaction occurs, structures that are most vulnerable to liquefaction include buildings with shallow foundations, railways, buried structures, retaining walls, port structures, utility poles, and towers.

The General Plan SE identifies the lower-elevation areas of Project site as areas of high liquefaction potential. In areas that have the potential for liquefaction, site-specific investigations are required, including subsurface sampling to determine the actual risk of settlement or liquefaction. The Preliminary Soils Engineering Report (GeoSolutions, Inc. 2016) and the Preliminary Engineering Geology Investigation (GeoSolutions, Inc. 2017) prepared for the Project concluded that the liquefaction hazard at the site is considered low in the upper elevations of the site. In the lower-elevation areas, based on the consistency and relative density of the existing soils, the potential for seismic liquefaction of soils is also low. The potential for seismically induced settlement and differential settlement at the site is low with implementation of geotechnical recommendations (Appendix G).

Landslides and Slope Instability

The stability of slopes is affected by rock and soil type, amount of water present, and amount of vegetation present. Sudden movements can cause a slope to fail, such as during

a seismic event, modification (i.e., grading) of the slope, undercutting caused by erosion, and changes in hydrologic characteristics, including heavy rains that can saturate the soil.

The General Plan SE classifies the upper-elevation areas of the Project site as having moderate landslide potential. Slopes within the Project site are topped with a layer of colluvium or alluvium, which may be subject to erosion. Just beneath this layer lies the Franciscan Complex geologic unit, which is hard and stable rock. This geologic arrangement indicates that the western upper-elevation portion of the property is generally stable. Additionally, the potential for slope failure due to a seismic event is considered low. While evidence of a small landslide (surface slump) was found along the eastern boundary of the Project site, no significant landslide event was found on published geologic maps or through air photo analysis. Finally, the potential for ridgetop instability is considered moderate if structures are located at the top of local ridges or peaks. Overall, the potential for slope instability (that is not caused by a seismic event) is considered low (Appendix G).

Expansive Soils

Expansive soils tend to swell with seasonal increases in soil moisture in the winter months and shrink as soils become drier in the summer months. Repeated shrinking and swelling of the soil can lead to stress and damage of structures, foundations, fill slopes and other associated facilities. Soil expansion potential at the site was determined to be moderate to very high based on laboratory testing. The expansion potential is classified based on tested expansion index values of very low (values 0 to 20), low (21 to 50), medium (51 to 90), high (91 to 130), and very high (greater than 130)(FEMA 2011). Expansion index tests conducted on soil samples collected from the Project site yielded values of 79 to 186. The values indicate that the soils tested have moderate to very high potential for expansion per California Building Code (CBC) (Appendix G).

Subsidence

Subsidence is the downward shift of the ground surface relative to a datum, such as sea level or groundwater level. Subsidence may be caused by mineral dissolution, earth extraction activities, geological faulting, seasonal effects that cause changes in soil moisture content, or the withdrawal of pressurized fluids (e.g., groundwater, oil, or gas) from subsurface aquifers. Deep subsidence and hydrocompaction are two types of subsidence that occur most frequently in the western U.S. Deep subsidence is the slow

downward movement of land caused by the withdrawal of pressurized fluids from the subsurface, including groundwater pumped from confined aquifers and fluids pumped from oil and gas reservoirs, such as within the California Central Valley (NASA 2016). Much of the western U.S. is characterized by geologic conditions that are susceptible to hydrocompaction. Hydrocompaction is the subsidence of shallow soils as a result of adding water, and is generally associated with dry regions where agriculture relies on irrigation. Irrigated agricultural practices have not been recorded on the Project site historically, as it has primarily been used as grazing land.

There is potential for subsidence within the Project site due to its location within the San Luis Obispo Valley above a groundwater basin and the loose, moist, clayey soils that exist within the lower-elevation areas of the site (County of San Luis Obispo 2016). The potential for subsidence at the site is considered to be low with implementation of geotechnical recommendations (Appendix G).

Differential Settlement

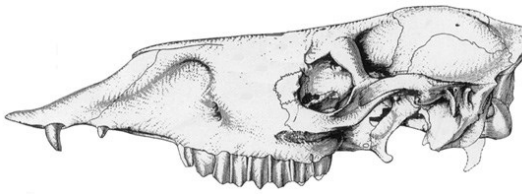
Differential settlement is the process whereby soils settle non-uniformly, potentially resulting in stress and damage to utility pipelines, building foundations, or other overlying structures. Such movement can occur in the absence of seismically induced ground failure, due to improper grading and soil compaction or discontinuity of underlying fill and naturally occurring soils. Strong ground shaking often greatly exacerbates soil conditions already prone to differential settlement, resulting in distress to overlying structures. Elongated structures, such as pipelines, are especially susceptible to damage as a result of differential settlement.

According to the General Plan SE and the results of the Preliminary Soils Engineering Report, there is a low potential for seismically induced settlement in the western elevated topographic areas at the site based upon the depth to Franciscan Complex units and densities within the subsurface. However, there is a potential for seismically induced settlement in the eastern lower-topographic areas at the Project site based upon the depth of the sediments and densities within the subsurface (Appendix G)

3.6.1.5 Paleontological Resources

Paleontological resources are the evidence of once-living organisms as preserved in the rock record. They include both the fossilized remains of ancient plants and animals and the

traces thereof (e.g., trackways, imprints, burrows, etc.). In general, fossils are considered to be older than recorded human history or greater than 5,000 years old and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions(Society of Vertebrate Paleontology [SVP] 2010). Sources of information for this section include museum collections records, geologic mapping, and geotechnical investigation reports completed for the Project (Appendix G).



Geologic units that have low potential to contain significant paleontological resources underlie the Project site. While they have a low potential, similar geologic units within the County have produced fossils including those of an extinct camel (Camelops hesternus) found in Quaternary-aged sediments in the County. While rare, such resources may be present within the Project site.

The geologic setting is key to understanding the potential for important paleontological resources to be located in the Project site (Table 3.6-3). The Project site is located in the vicinity of the San Luis Range of the Coast Range Geomorphic Province of California (Appendix G). The Coast Ranges lie between the Pacific Ocean and the Sacramento-San Joaquin Valley and trend northwesterly along the California Coast for approximately 600 miles between Santa Maria and the Oregon border. Locally, the Project site is located along the southwestern flank of the Santa Lucia Mountain Range and east of the adjacent Irish Hills. Paleontological resources have been discovered throughout the County and include extensive collections of marine invertebrates from rocks of Cretaceous to Recent age; marine vertebrates from rocks of Miocene to Pliocene age along the Pacific Coast, and terrestrial vertebrates from rocks of Oligocene to Miocene age from the eastern part of the County (University of California Museum of Paleontology [UCMP] 2018; Jefferson et al. 1992).

Table 3.6-3. Geologic Units and Paleontological Potential Within Project Vicinity

Geologic Unit Label	Geologic Unit Name	Age	Paleontological Potential
AF	Artificial Fill	Present	None
Qls	Landslide Deposits	Quaternary-Present	Low
Qf	Alluvial Fan Deposits	Quaternary-Present	Low
Qal	Stream Deposits	Holocene	Low
KJfmv	Franciscan Complex – Metavolcanics	Jurassic-Cretaceous	Low
KJfs	Franciscan Complex - Serpentinite	Jurassic-Cretaceous	Low

Source: California Department of Conservation 2010.

Paleontological resources are found within the geologic deposits or bedrock that underlie the soil layer. A search of UCMP's public locality database along with the Paleobiology Database (paleodb.org) was conducted to identify information on paleontological localities within and near the Project site and to determine if fossil resources have been recovered from geologic formations similar to those present in the Project vicinity.

Museum records indicate that no previously recorded vertebrate paleontological localities are recorded within the boundaries of the Project site. The UCMP database records a total of 2,003 specimens from the County, including 427 invertebrate fossils, 1,114 microfossils, 320 plant fossils, and 142 vertebrate fossils. Of the 142 vertebrate fossil specimens, two were recovered from rocks of similar type and age as those that occur on the Project site. The first, a camel astragalus (ankle bone), was recovered from indeterminate Quaternary-aged units near San Miguel; the second specimen, two vertebrae of the aquatic reptile *Plesiosaurus hesternus*, was identified in metamorphosed sedimentary units of the Franciscan Complex near Oakley Ranch located near Highway 166, approximately 27 miles southeast of the Project site (UCMP Collections Database 2018). Other Pleistocene-aged vertebrate collections from the County are listed in Table 3.6-4.

Table 3.6-4. Non-UCMP Pleistocene Localities of San Luis Obispo County

Locality Name	Recovered Fauna
Arborgast Ranch, Salinas River Valley	Mammoth, horse, antique bison
Carizzo Plains School	Mastodon, mammoth, camel, long-horned bison
Chorro Creek, Morro Bay	Mammoth
Cayucos	Squirrel
Creston	Mammoth
Crowbar Canyon (Montana del Oro State Park)	Cod
Irish Canyon, Point San Luis area	Horse, antique bison
Mankin, Ranchita Cattle Company	Mammoth
Pecho Creek, Diablo Canyon area	Horse, giant ground sloth, camel
Point San Luis	Indeterminate whale or dolphin
Salinas River Sand Site	Mammoth
San Miguel, Salinas River Valley	California condor, puffin, auklet, flightless sea duck, bald eagle, barn owl, vole, mammoth, camel, sea otter

Source: Jefferson et al. 1992.

3.6.2 Regulatory Setting

Geologic resources, paleontological resources, and geotechnical hazards are governed primarily by local jurisdictions, although federal and state laws would apply to future development under the Project. Federal, state, and local regulations, including the CBC, that are directly relevant to the Project are summarized below.

3.6.2.1 Federal

Federal Soil Conservation Law (16 USGS 590a)

By Congressional policy, this law provides permanently for the control and prevention of soil erosion by preventative measures, including but not limited to engineering operations, methods of cultivation, growing of vegetation, and changes in land use.

Clean Water Act Section 402 (Erosion Control)

The Clean Water Act (CWA) was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain nonpoint source discharges to surface water. Those

discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). Projects that disturb one acre of soil or more, or are part of a common plan that in total disturbs more than one acre, are required to obtain NPDES coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction Activity (General Permit), Order No. 2009-0009-DWQ. The General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), which includes Best Management Practices (BMPs) to protect stormwater runoff, including measures to prevent soil erosion.

Department of Toxic Substances Control (Information Advisory Clean Imported Fill Material)

The Information Advisory Clean Imported Fill Material provides guidance for prevention of inappropriate fill materials use in sensitive land use properties, which include hospitals, homes, day care centers, and schools. DTSC provides guidelines for appropriate type of soil analyses for relative former land use as well as the number of samples that are required for collection and analysis.

3.6.2.2 State

California Building Code

The State of California provides minimum standards for building design through the CBC. In accordance with the CBC, a grading permit is required if more than 50 cubic yards of soil are moved during implementation of a project. Chapter 16 of the CBC contains definitions of seismic sources and the procedure used to calculate seismic forces on structures. Chapter 18 of the CBC contains standards and regulations relating to soil stability, design standards for seismic safety, and construction standards for building foundations. Specific regulations in Section 1803 require geotechnical investigations or preliminary soil reports as a condition of building permit approval. Section 1804 provides regulations on the siting of structures and site grading based on the soils and slope stability of a site. Section 1808 establishes regulations for the design and construction of building foundations, with emphasis on stability (i.e., issues pertaining to shifting soils, seismic overturning and expansive soils) and design loads.

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. In accordance with this law, the California Geological Survey maps active faults and designates Earthquake Fault Zones along mapped faults. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be "sufficiently active" and "well defined" by detailed site-specific geologic explorations in order to determine whether building setbacks should be established. Any project that involves the construction of buildings or structures for human occupancy, such as an operation and maintenance building, is subject to review under the Alquist-Priolo Earthquake Fault Zoning Act, and any structures for human occupancy must be located at least 50 feet from any active fault.

Seismic Hazards Mapping Act & Mapping Regulations

These regulations were promulgated for the purpose of promoting public safety by protecting against the effects of strong ground shaking, liquefaction, landslides, other ground failures, or other hazards caused by earthquakes. The Act requires that site- specific geotechnical investigations be conducted identifying the hazard and formulating mitigation measures prior to permitting most developments designed for human occupancy. Special Publication 117, Guidelines for Evaluating and Mitigating Seismic Hazards in California, from the California Division of Mines and Geology constitutes the guidelines for evaluating seismic hazards other than surface fault-rupture, and for recommending mitigation measures as required by PRC Section 2695, subdivision (a).

3.6.2.3 Local

City of San Luis Obispo General Plan

Safety Element (SE)

Policy 4.5 Avoiding Faults. Development shall not be located atop known faults. Applications for the following types of discretionary approvals within 100 meters (330 feet) of any fault that is previously known or discovered during site evaluation shall be subject to review and recommendation by a state-registered engineering geologist: change

to a more intensive land-use designation; subdivision into five or more parcels; development of multifamily, commercial, industrial, or institutional buildings.

Policy 4.6 Avoiding Slope Instability. Development shall not be located on or immediately below unstable slopes, or contribute to slope instability. Any development proposed in an area of moderate or high landslide potential shall be subject to review and recommendation by a state-registered engineering geologist.

Policy 4.7 Avoiding Liquefaction Hazards. Development may be located in areas of high liquefaction potential only if a site-specific investigation by a qualified professional determines that the proposed development will not be at risk of damage from liquefaction. The Chief Building Official may waive this requirement upon determining that previous studies in the immediate area provide sufficient information.

Policy 9.18 Safety of Structures and Facilities. Existing and new structures and facilities should reflect adopted safety standards. Within this policy, the City has developed programs for reducing structural hazards, development review, and conducting safety inspections.

Land Use Element (LUE)

Policy 6.4.3 Hillside Policies – Development Standards. San Luis Obispo wants to keep open its steeper, higher, and most visible hillsides. Some of the lower and less steep hillside areas; however, are seen as suitable for development, particularly where development is coupled with permanent open space protection of the more sensitive areas. This policy focuses on where and how some hillsides may be developed. Topics include standards and policies for hillside development for aesthetics, open space, and directing development away from areas with hazards such as landslides, wildland fires, flooding, and erosion.

Conservation and Open Space Element (COSE)

Policy COSE 3.5.1 Archaeological Resource Protection. The City shall provide for the protection of both known and potential archaeological resources. To avoid significant damage to important archaeological sites, all available measures, including purchase of the property in fee or easement, shall be explored at the time of a development proposal. Where such measures are not feasible, and development would adversely affect identified

archaeological or paleontological resources, mitigation shall be required pursuant to the Archaeological Resource Preservation Program Guidelines.

City of San Luis Obispo Municipal Code

The City Municipal Code, Title 16 Subdivisions, establishes minimum submittal requirements for the submittal of a tentative map and establishes a process for review of plans by licensed professionals. This includes technical reports on faulting, slope analysis, soils, and engineering geology. Further, Title 15 Building and Construction, provides standards for grading and development on expansive soils. Coupled with development standards within the CBC, standards within Title 15 and 16 are intended to ensure the safety of life and property through the regulation of development.

San Luis Obispo County General Plan Safety Element

The County's General Plan SE describes geologic conditions that occur in the County and provides policies and implementation measures to minimize the potential for loss of life and property resulting from geologic and seismic hazards.

Per the County's Interactive Maps database (Land Use View), the western upper portions of the Project site are within a mapped Geologic Study Area combining designation.

3.6.3 Environmental Impact Analysis

3.6.3.1 Thresholds of Significance

With respect to geologic and soils impacts, applicable sections of Appendix G of the CEQA Guidelines state that a project would normally have a significant impact on the environment if it would:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault. Refer to Division of Mines and Geology Special Publication 42;

   ii. Strong seismic ground shaking;

iii. Seismic-related ground failure, including liquefaction; or

iv. Landslides.

b) Result in substantial soil erosion or the loss of topsoil.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Non-Applicable Thresholds

- Threshold (e) (*Septic Systems*): Development in accordance with the Project would not involve the use or development of septic tanks or alternative wastewater disposal systems, since sewer system and wastewater treatment facilities are available for the disposal of wastewater at the Project site. As such, there would be no potentially significant adverse impacts related to septic systems and this issue will not be analyzed further in this EIR. Wastewater treatment and infrastructure impacts are addressed in Section 3.14, *Utilities and Energy Conservation*.

3.6.3.2 Impact Assessment Methodology

Geology and Soils

This analysis evaluates the potential impacts to local and regional geologic hazards (e.g., fault rupture, seismic shaking, liquefaction, landslides, expansive soils) resulting from the Project, including soil erosion or loss of top soil. Existing conditions, including the configuration of the Project site, current operations, and present geologic setting were established based on site-specific information obtained from the General Plan SE, U.S. Geological Survey (USGS) data, and reports prepared by GeoSolutions, Inc. and peer reviewed by Wood, Environment and Infrastructure Solutions, Inc. (Wood). These reports include the Applicant-prepared Preliminary Soils Engineering Report (2016), Preliminary Engineering Geology Investigation (2017), and Subsurface Fault Investigation and

Development Setback Map (2017) to assess geologic conditions within the site. These reports describe geologic conditions based on literature review, field reconnaissance, subsurface exploration, including soil boring, soil laboratory testing, geologic surface mapping, and fault investigations to classify subsurface soil and formational units and to supplement regional geologic mapping. These reports and investigations were prepared in the absence of final development plans, and consequently provide only general recommendations regarding geologic site suitability for planning-level analysis. Recommendations from the site-specific reports will be incorporated into the Project, as required by the General Plan SE. These reports are provided as Appendix G of this EIR.

Paleontological Resources

The SVP (2010) guidelines were used for the assessment of potential for paleontological resources to occur within the Project site. According to CEQA, the threshold of significance for impacts to paleontological resources is reached when a project would disturb or destroy scientifically important fossil remains, as defined by the SVP. Significant paleontological resources are defined as "identifiable" vertebrate fossils, uncommon invertebrate, plant, and trace fossils that provide taphonomic (i.e., the study of what happens to an organism after its death and until its discovery as a fossil), taxonomic, phylogenetic, paleoecologic, stratigraphic, or biochronological data. These data are important because they are used to examine evolutionary relationships, provide insight on the development of and interaction between biological communities, establish time scales for geologic studies, and for many other scientific purposes(Scott and Springer 2003; SVP 2010). A literature review was conducted on museum collections records maintained by the UCMP, USGS published geologic mapping of the San Luis Obispo 7.5' Quadrangle by various authors and compiled by Wiegers and Gutierrez (California Department of Conservation 2010), and various geotechnical investigation reports completed for the Project (Appendix G).

3.6.3.3 Project Impacts and Mitigation Measures

Implementation of the Project has the potential to result in direct impacts to soils from erosion and grading, and impacts related to geologic hazards onsite and in the vicinity, including seismic hazards. Potential impacts related to geologic hazards and soils are discussed further below and summarized in Table 3.6-5.

Table 3.6-5. Summary of Project Impacts

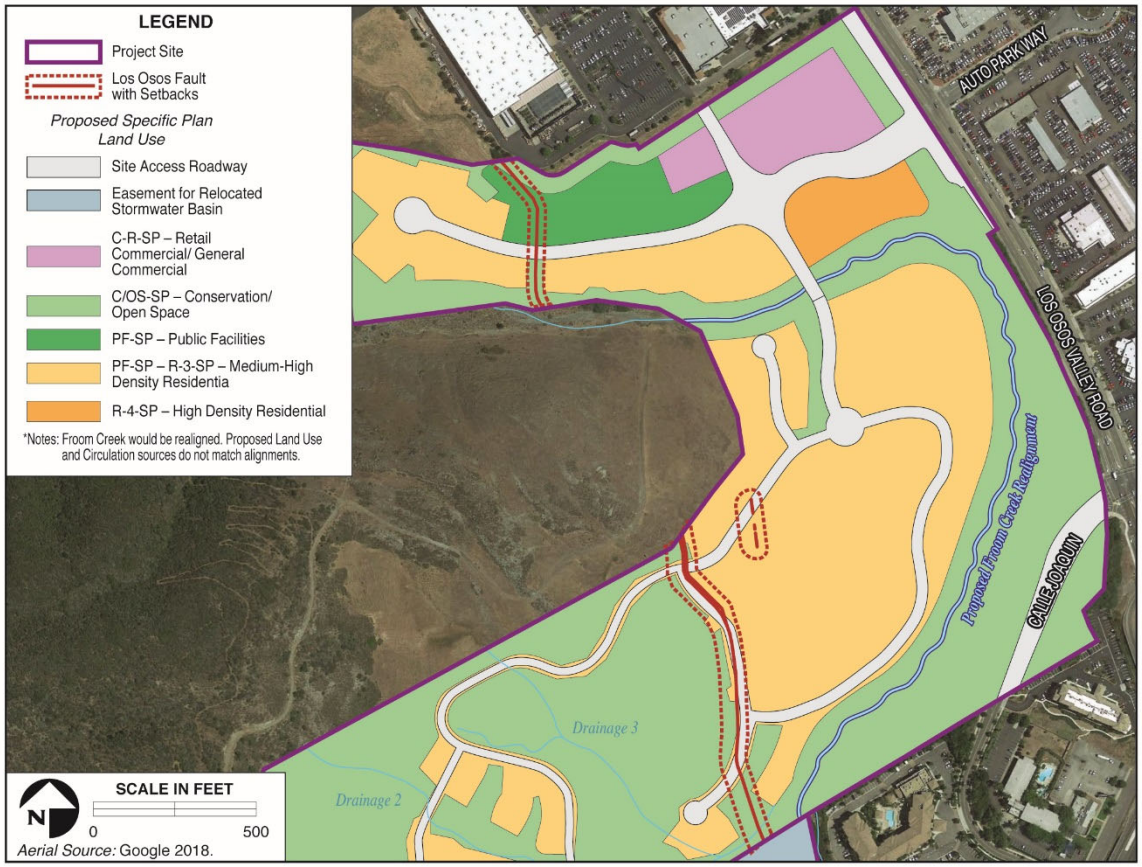
Geological Resources Impacts	Mitigation Measures	Residual Significance
GEO-1. The Project would expose people or structures to adverse effects from earthquakes and seismically induced hazards.	None required	Less than Significant
GEO-2. The Project has the potential to exacerbate potential soils hazards, including expansive soils, differential settlement, and subsidence.	None required	Less than Significant
GEO-3. The Project would potentially cause erosion, landslides, and rockfall.	None required	Less than Significant
GEO-4. The Project would include subterranean parking in Villaggio and may require groundwater dewatering in areas with high groundwater.	None required	Less than Significant
GEO-5. Project construction could uncover paleontological resources in geologic deposits during earthwork activities. If improperly handled, such resources could be adversely impacted.	MM GEO-1	Less than Significant with Mitigation

Impact GEO-1 The Project would expose people or structures to adverse effects from earthquakes and seismically induced hazards (Less than Significant).

The Project site is located in a seismically active region of California's Central Coast. While regional faulting (e.g., San Andres Fault) may generate seismic shaking at the Project site, the strongest potential ground shaking event for the site is anticipated to occur from a rupture of the Los Osos Fault. Ground acceleration at the site associated with an event on the Los Osos Fault or a moderate-to-large earthquake on any of the other local and regional faults has the potential to cause severe damage to buildings and infrastructure and threaten life and property.

A section of the Los Osos Fault runs through both the Madonna Froom Ranch and Villaggio portions of the site (refer to Figure 3.6-1). The Los Osos Fault Zone mapped at the Project site is not continuous, and portions in the Madonna Froom Ranch area of the site have not been active since the Quaternary age (i.e., over 700,000 years ago). However, fault segments in the Villaggio area have been active more recently in the Holocene age (approximately 11,000 years ago). If development were placed on the existing fault line and a seismic event occurred that resulted in faulting or rupturing, damage would occur to people and property in the immediate vicinity.

Based on the proposed land use plan, the Los Osos Fault would cross residential (R-3-SP), open space (C/OS-SP), and public facility (PF-SP) land uses (Figure 3.6-2). The fault and/or associated setback area underlays areas that are proposed for the development of segments of Local Roads "A" and "C", walking paths, the trailhead park, and the trailhead park parking lot. To reduce impacts to development, the Subsurface Fault Investigation (2017) conducted for the Project site conservatively recommends a development setback from the Los Osos Fault segments onsite. For the part of the fault crossing the northern portion of the site, a 25-foot setback on either side of the mapped fault is recommended by the investigation and will be incorporated into the Project. For the fault portion crossing the southern region of the site, a 50-foot setback along the western edge of the fault and a 30-foot setback along the eastern edge of the fault are recommended. In accordance, Section 3.2.3, Fault Lines, of the Draft FRSP incorporates these recommendations of the Subsurface Fault Investigation (Appendix G), including development standards to ensure habitable structures (structures occupied more than 2,000 hours per year) are constructed outside the recommended setbacks (of 25 feet, 30 feet, and 50 feet; refer to Figure 3.6-2).



wood.

Active Faults and Recommended Setback at the Project Site

FIGURE 3.6-2

The design and construction of proposed land uses would be subject to several requirements and regulations to ensure structural integrity in seismically active areas. As stated in Section 3.2.3, Fault Lines, of the proposed Draft FRSP, development plans would be required to be designed in accordance with applicable state and local standards for development near fault traces, including adherence to the International Building Code (IBC), the CBC, and the City Municipal Code, in addition to compliance with the General Plan SE Policy 4.5, Avoiding Faults. Planning-level recommendations within the Subsurface Fault Investigation and Development Setback Map (2017) for site preparation, grading, backfill, and foundations would be required for incorporation into the Project design. Further, because the Project does not propose or permit deep subsurface construction, and would be required to comply with applicable state and local standards for development near fault traces, the Project would not exacerbate the existing faulting hazards onsite.

Although the probability of a larger-than-expected earthquake with corresponding high ground acceleration is generally low, any structure built in California is susceptible to failure during significant seismic events. Such impacts are common throughout California and nothing can be done to absolutely ensure that structures do not fail during significant seismic events. However, impacts of structural failure and risks to life and property due to seismic shaking and seismic-related ground failure can be reduced by locating development outside of fault setbacks and implementing the most current industry standards for structural design. Through the incorporation of proper engineering measures in accordance with existing regulations (i.e., IBC, CBC, General Plan SE, and City Municipal Code), and application of Draft FRSP Section 3.2.3, Fault Lines, risks to life and property would be minimized. Recommendations from the Preliminary Engineering Geology Investigation and Subsurface Fault Investigation for site preparation, grading, backfill, and foundations would be required for incorporation into the Project design. In addition, subsequent development within the Project area may be subject to site-specific geotechnical investigations and further recommendations to minimize hazards near a known fault per the General Plan SE.

Seismically induced hazards include ground surface ruptures, tsunamis and seiches, settlement and slope failure, or liquefaction that occur as a result of ground shaking or earthquake events. Based on the geotechnical investigations conducted for the Project site, although the site is transected by a fault line, the site is not located within an Earthquake

Fault Zone and is not subject to ~~a moderate or~~ high threat of ground surface rupture. Additionally, based on the consistency and relative density of in-situ soils at the Project site, the potential for liquefaction of soils at the Project site is low.

Despite the limited probability for other seismically induced hazards, given the depth of sediments and densities within the subsurface, the lower-elevation areas of the Project site contain a low potential for liquefaction-induced failures. The Preliminary Soils Engineering Report (Appendix G) includes recommendations that address liquefaction, including a recommendation that all of the foundations are established on equally competent uniform material. Future development under the Draft FRSP may continue to be subject to risk from liquefaction or settlement of soils in the event of ground shaking. However, consistency with Title 15 of the City Municipal Code and General Plan SE Policy 4.7, Avoiding Liquefaction Hazards, would require site-specific investigations and a determination that proposed development would not be at risk of damage from liquefaction.

Impacts of structural failure and risks to life and property due to seismic shaking and seismically induced hazards can largely be reduced by complying with state and local building regulations for site preparation and structural design. Therefore, compliance with federal, state, and local regulations, in addition to the recommendations of the Subsurface Fault Investigation and Preliminary Engineering Geology Investigation (Appendix G) would reduce the impacts associated with seismicity or seismically induced hazards to *less than significant*.

Impact GEO-2 The Project has the potential to exacerbate potential soils hazards, including expansive soils, differential settlement, and subsidence (Less than Significant).

The soil zone within the upper two to three feet of the Project site has the potential to be affected by seasonal changes in moisture content. Seasonal fluctuations in soil moisture and proximity to adjacent drainages (i.e., Froom Creek) can result in geologic hazards from expansive soils, especially within the lower-elevation areas of the site where shallow groundwater is present (ranging between 1.5 to 4.0 feet bgs). The volume change associated with this soil movement can stress and damage foundations, concrete flatwork, interior slabs-on-grade, and roadway pavements. These loose and saturated soils beneath the Project site could potentially result in damage to roadways, structures, parking lots,

commercial buildings, and the hydrology of realigned Froom Creek, should the proposed structural shoring and foundations not be properly designed and constructed. The potential for subsidence to occur with or without the Project is low. The Project does not propose any actions that would cause or exacerbate subsidence (e.g., withdrawal of groundwater/oil, hydrocompaction).

Construction of the Project site would involve large amounts of grading, earthmoving, and the import of engineered fill foundation in the lower-elevation areas. Fill material used for building pads would be compacted and would reduce the amount of loose alluvial soils that are in direct contact with structural foundations constructed within the Project site. This would reduce the amount of loose and saturated soils that may be expansive after the buildings are constructed. Imported soil for backfill would be sampled to ensure no soil contamination is present in accordance with DTSC requirements for Clean Imported Fill Material. Further, the Project's Preliminary Soils Engineering Report includes recommendations that address expansion and differential settlement. The report recommends that all foundations are established on equally competent uniform material, to address the potential for differential settlement occurring when foundations supported on two soil materials have different settlement characteristics. In combination with the use of engineered fill foundation in lower-elevation areas of the Project site, uniform foundations would reduce risks associated with expansion and differential settlement.

Implementation of recommendations outlined in the Preliminary Soils Engineering Report and the geotechnical recommendations included therein would reduce impacts related to construction and operation of the Project on soils that are loose, saturated, and expansive. Additionally, compliance with federal, state, and local regulations (i.e., IBC, CBC, the General Plan SE, and the City Municipal Code) would reduce impacts associated with expansive soils, differential settlement, and subsidence as a result of the Project. Impacts would be *less than significant*.

Impact GEO-3 The Project would potentially cause erosion, landslides, and rockfall (Less than Significant).

The Project includes the excavation of approximately 160,000 cubic yards of soil and rock. Grading for site development has the potential to expose undocumented fill and existing soft alluvium soils, which may erode or slide. During construction, due to the topography

and proposed disturbances along the base of steep slopes, loose alluvium soils would temporarily be subject to erosion, especially on upper-elevation areas (e.g., Upper Terrace). Beneath the loose alluvial soils, the presence of shallow and hard bedrock materials within the Upper Terrace may result in hard digging and excavation conditions. These conditions are anticipated in some areas during building pad preparation and underground utility construction on the hillsides and would contribute to the disturbance of topsoil. These excavation activities would be entirely located within the Project site; therefore, potential erosion is largely anticipated to be contained within the Project site and not affect surrounding areas.

While there is the potential for limited slope instability to occur during excavation and construction activities, implementation of the CBC and compliance with federal, state, and local regulations would reduce the potential for erosion and long-term impacts during construction of the Project. Additionally, because more than one acre of land would be disturbed during the construction phase, the applicant would be required to prepare a Storm Water Pollution Prevention Plan (SWPPP) and obtain a storm water permit from the RWQCB. Refer to Section 3.7, *Hazards, Hazardous Materials, and Wildfires*, and Section 3.8, *Hydrology and Water Quality,* for additional information on stormwater permit requirements and erosion control measures. Compliance with permit conditions would require implementation of erosion control Best Management Practices (BMPs). Based on the relatively short period of time that soils would be susceptible to erosion, and because construction activities would require implementation of erosion control measures as recommended by the Preliminary Soils Engineering Report, impacts associated with erosion would be low. Further, the Preliminary Engineering Geology Investigation (Appendix G) establishes planning-level recommendations that would help to reduce impacts on the Project site's slopes. Therefore, the potential for significant erosion hazards during the construction phase would be low.

Potential for landslides to occur at the Project site is considered low, and slopes at the Project site are generally stable due to the presence of shallow and hard bedrock materials within the Upper Terrace that provides a solid base for development. Implementation of the Project is not anticipated to cause or be subject to landslide hazards due to the slope stability of the site. Further, the potential for rockfall overall at the site is considered low, although one area has been identified as a potential rockfall hazard area in the Upper Terrace. Based on the conceptual land use plan for the Project, the area of potential rockfall

hazard is proposed for development of private access roadways and medium-high density residential uses. The development within or downslope of the potential rockfall hazard area may be affected if the slope is disturbed (see Impact GEO-1 for a discussion of seismic hazards).

Implementation of recommendations outlined in the Preliminary Soils Engineering Report and Preliminary Engineering Geology Investigation (Appendix G) and included therein, would reduce impacts related to development of the Project on soils that are steep and potentially unstable. Additionally, compliance with federal, state, and local regulations (i.e., IBC, CBC, the General Plan SE, and the City Municipal Code) would reduce impacts associated with erosion, landslides, and rockfall hazards. Impacts would be *less than significant*.

Impact GEO-4 The Project would include subterranean parking in Villaggio and may require groundwater dewatering in areas with high groundwater (Less than Significant).

As previously discussed, most soils within the Project site are alluvial soils with high groundwater levels, especially within Villaggio where site topography is level and at a lower elevation. Several subsurface parking structures are anticipated to be constructed within the Villaggio adjacent to the proposed Froom Creek realignment. These parking structures may be excavated up to 12 feet bgs. According to the Project's geology and soils reports, shallow groundwater levels were observed at a depth of 1.5 to 4.0 feet bgs. Subsurface construction in this area may encounter groundwater or saturated soils. Additionally, the Project would import engineered fill material, and natural seepage could occur at the interface of the native soils and engineered fill resulting in soil saturation. Further, if designed incorrectly, the intrusion of groundwater into these structures may occur. Where subterranean structures are proposed, shoring and groundwater dewatering may be necessary to support construction of these structures. In cases where the floor of subterranean parking foundations encounters the groundwater table, ongoing groundwater dewatering may be necessary to prevent the percolation or inflow of groundwater into excavation pits and future garage/basement levels.

To prevent groundwater from entering into and potentially damaging the Project, the Soils Engineering Report ~~Preliminary Engineering Geology Investigation~~ recommends that as a

minimum, the upper 36 inches (three feet) of the development area should consist of a select import material on top of existing grade or in replacement of the existing surficial soils. This would allow for support of mat foundations for the proposed structures. An increase in thickness of the select import material to a minimum of five feet would allow for the use of conventional foundation systems. Additional recommendations are provided to ensure the perimeter of the excavation would act as an impermeable barrier to groundwater infiltration through shoring in accordance with Occupational Safety and Health Administration (OSHA) regulations.

To limit potential for saturated soils or groundwater intrusion, the Project would import engineered fill material to elevate the lower-elevation areas of the Project site to a finished grade of at least one foot above the 100-year floodplain. Further, realignment of Froom Creek and alteration of the 100-year floodplain would change the site topography to ensure development avoids groundwater intrusion. Where necessary, the finished grade may be raised several feet above the existing grade. Implementation of the above measures and compliance with federal, state, and local regulations would reduce impacts associated with development on an area of potential shallow groundwater to *less than significant*.

Impact GEO-5 Project construction could uncover paleontological resources in geologic deposits during earthwork activities. If damaged or improperly handled, such resources could be adversely impacted (Less than Significant with Mitigation).

As documented in Section 3.6.1.5, the geologic deposits underlying the Project site, including Quaternary-aged alluvial deposits and meta-sediments of the Franciscan Complex, have a low potential for containing paleontological resources in accordance to criteria set forth by the SVP (2010). Surficial deposits of Holocene age or previously disturbed sediments are determined to have a low paleontological sensitivity because they are either too young or unlikely to preserve fossilized remains. However, if paleontological resources were uncovered during Project construction and were then improperly handled, such unknown paleontological resources could be damaged or destroyed resulting in a *potentially significant* impact.

Mitigation Measures

MM GEO-1 *Prior to construction of each phase, workers shall receive education regarding the recognition of possible paleontological resources, during grading and excavation. Such training shall provide construction personnel with direction regarding the procedures to be followed in the unlikely event that previously unidentified paleontological materials are discovered during construction. Training shall also inform construction personnel that unauthorized collection or disturbance of paleontological resources is not allowed. The training shall be prepared by a City-approved paleontologist and shall provide a description of paleontological resources that may be encountered in the Project site, outline steps to follow in the event that a discovery is made, and provide contact information for the Project paleontologist and appropriate City personnel. The training shall be conducted concurrent with other environmental or safety awareness and education programs for the Project, provided that the program elements pertaining to paleontological resources is provided by a qualified instructor meeting applicable professional qualifications standards. In order to prevent inadvertent potential significant impacts to paleontological resources that may be encountered during ground disturbance or construction activities, in the event of any inadvertent discovery of paleontological resources during construction, all work within the vicinity of the resource established by the City-approved paleontologist shall temporarily cease. If a paleontological resource is discovered, the City-approved paleontologist shall be notified to assess the significance of the find and provide recommendations as necessary for its proper disposition.*

Requirements and Timing. Prior to ground disturbance for each phase, construction workers shall participate in an educational program that will enable them to recognize and report possible paleontological resources. The conditions for treatment of discoveries shall be printed on all grading plans. The City shall be notified immediately after the unanticipated discovery of a paleontological resource. Paleontological reports shall be reviewed and approved prior to issuance of occupancy. In the event that any potentially significant paleontological resources are uncovered during ground disturbance or construction activities:

a. Temporarily cease grading in the vicinity of the resource established by the City-approved paleontologist and redirect activity elsewhere to ensure the preservation of the resource in which the discovery was made;

b. Immediately notify the City of San Luis Obispo Community Development Department regarding the resource and redirected grading activity;

c. Obtain the services of a City-approved professional paleontologist who shall assess the significance of the find and provide recommendations as necessary for its proper disposition for review and approval by City of San Luis Obispo Community Development Department.

d. Complete all significance assessment and mitigation of impacts to the paleontological resource and verification reviewed and approved by City of San Luis Obispo Community Development Department prior to resuming grading in the area of the find.

Monitoring. Paleontological reports prepared for the Project site in response to an unanticipated discovery shall be maintained by the City of San Luis Obispo Community Development Department.

Residual Impact

The protection of potential paleontological resources would be assured through implementation of mitigation measure MM GEO-1. The qualified paleontologist would ensure that if an inadvertent paleontological discovery were to occur, adequate steps would be taken to document and preserve the paleontological resource, resulting in impacts that are *less than significant with mitigation*.

3.6.3.4 Cumulative Impacts

Cumulative impacts related to geology and soils would result if Project impacts, when combined with other past, present, and future projects, would cumulatively increase the

potential for geologic hazards, such as ground shaking, or increased soil impacts, such as erosion. Although the probability of a larger-than-expected earthquake with corresponding high ground acceleration is low, it is not zero. Consequently, any structure built in the seismically active region of the Central Coast is inherently at risk to damage during major seismic events. The majority of structures on properties bordering the site were constructed within the past 30 years, including the hotels along Calle Joaquin, Mountainbrook Church, and Irish Hills Plaza. These structures were required to meet CBC standards to prevent them from hazardous conditions to public safety due to soil instability during an earthquake.

Cumulative development such as that anticipated under the projects listed within Table 3.0-1 may uncover previously undisturbed paleontological resources and could potentially result in damage or loss of such resources. However, in most cases project-specific impacts would be addressed on a project-by-project basis. Additionally, in accordance with the City Municipal Code and the General Plan SE, all discretionary development within the City, including development projects listed in Table 3.0-1 in Section 3.0, *Environmental Impact Analysis and Mitigation Measures,* would be required to undergo analysis of each site's geological and soil conditions prior to construction. This analysis would include investigations of native soils onsite and the structural stability of any proposed subterranean structures to ensure each individual project is designed and engineered to withstand reasonably foreseeable seismic activity or unstable soil conditions and would meet the most current and stringent building safety requirements. Further, because all projects would be required to undergo an analysis of site-specific geological and soil conditions, and because restrictions on development would be applied in the event that geological or soil conditions pose a risk to safety, it is anticipated that the Project's contribution to cumulative impacts associated with seismic activity, soil instability, subsidence, collapse, and/or expansive soil would be *less than significant*.