Section 4.7
Geology and Soils

4.7.1 Overview

This section describes the existing conditions and applicable laws and regulations ~~regarding~~for geology and soils. It then analyzes the project's potential to exceed the thresholds of significance for impacts associated with geotechnical hazards and soil conditions (such as soil erosion of damage to paleontological resources).

4.7.2 Existing Conditions

The following discussion describes the existing geologic conditions and related ~~potential~~ hazards in the project site and vicinity. It first identifies the area's geology, followed by groundwater characteristics, faulting, seismicity, and paleontological conditions. Data is sourced from the Ninyo & Moore *Geotechnical Evaluation* performed for the project, dated December 30, 2020 (Appendix F); United States Geological Survey (USGS) data; United States Department of Agriculture (USDA) Web Soil Survey data; a San Diego Natural History Museum Paleontological Records Search, from May 25, 2021; and other web-accessible public resources as referenced throughout.

4.7.2.1 Geology and Subsurface Conditions

Regional Geology

~~As stated in~~Based on the findings of the *Geotechnical Evaluation,* the project ~~site~~ is situated in the coastal foothill section of the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California. The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the Southern California batholith. The portion of the province in San Diego County that includes the project area consists generally of Cretaceous-age sedimentary and granitic rock.

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending approximately northwest. Several of these faults are considered active (Jennings, 2010). The Elsinore, San Jacinto, and San Andreas faults are active fault systems located northeast of the project area, and the Rose Canyon, Coronado Bank, San Diego Trough, and San Clemente faults are active faults to the west of the project area. The Elsinore fault zone is the nearest active fault system and has been mapped approximately 21 miles east of the project site. Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement. Further discussion of faulting relative to the site is provided under Section 4.7.2.2, *Faults and Seismicity*.

Local Geologic Setting

~~As stated in~~Based on the findings of the *Geotechnical Evaluation,* topsoil is present on the project site from the ground surface to depths of approximately 3.8 feet. Underlying the topsoil is decomposed granitic rock, observed in varying degrees of weathering with the rock being less weathered with depth. Unweathered granitic rock corestones were encountered underlying topsoil, and boulders were observed in the surface at numerous locations within the site. The subsurface unit mapped on the project site is Cretaceous-age Lusardi Formation. The Lusardi Formation generally consists of cobble and boulder conglomerate with thin lenses of sandstone.

Groundwater

Groundwater was not encountered during ~~the~~Ninyo & Moore's site evaluation, which included test pits of depths up to 7.2 feet. However, perched groundwater or groundwater seepage may be encountered between the contact of topsoil and granitic rock or within fractures in the granitic rock. Fluctuations in groundwater typically occur due to variations in precipitation, ground surface topography, subsurface stratification, irrigation, groundwater pumping, flooding, and other factors.

4.7.2.2 Faults and Seismicity

Regional

The numerous faults in Southern California include active, potentially active, and inactive faults. As defined by the California Geological Survey (CGS), active faults are faults that have ruptured within Holocene time, or within approximately the last 11,000 years. Potentially active faults are those that show evidence of movement during Quaternary time (approximately the last 1.6 million years), but for which evidence of Holocene movement has not been established. Inactive faults have not ruptured in the last approximately 1.6 million years.

Onsite Faulting and Ground Surface Rupture

The site is located in a seismically active area, as is the majority of Southern California, and the potential for strong ground motion is ~~therefore~~ considered significant during the design life of the proposed structures. State of California Earthquake Fault Zones (formerly known as "Alquist-Priolo Special Studies Zones") are regulatory zones delineated by the State Geologist based on Holocene-active faults that may be associated with surface fault rupture (CGS 2018). Holocene-active faults have had surface displacement within Holocene time (the last 11,700 years), while pre-Holocene faults had past surface movement older than 11,700 years and thus are not determined to meet the criteria for a Holocene-active fault. Surface fault rupture is the result of the movement of a fault that breaks the ground surface either during sudden earthquakes, or due to the slow process of "~~.~~fault creep~~.~~". Surface fault rupture can result in hazards to structures, infrastructure, and users due to damage or collapse. The Earthquake Fault Zones are depicted on the Earthquake Fault Zone Map published using geographic information system (GIS) by CGS (2018). Based on the Ninyo & Moore review of the referenced geologic maps and site reconnaissance, no faults are mapped as underlying the project site. Additionally, the site is not located within a State of California Earthquake Fault Zone.

Liquefaction, Lateral Spreading, and/or Seismically Induced Settlement

Liquefaction is the phenomenon in which loosely deposited granular soils with silt and clay contents of less than approximately 35% and non-plastic silts located below the water table undergo rapid loss of shear strength when subjected to strong earthquake-induced ground shaking. Ground shaking of sufficient duration results in the loss of grain-to-grain contact due to a rapid rise in pore water pressure, and causes the soil to behave as a fluid for a short period of time. Liquefaction is known generally to occur in saturated or near-saturated cohesionless soils at depths shallower than 60 feet below the ground surface. Factors known to influence liquefaction potential include composition and thickness of soil layers, grain size, relative density, groundwater level, degree of saturation, and both intensity and duration of ground shaking. Based on data from the San Diego Geographical Information System (SanGIS)/San Diego Association of Governments (SANDAG) GIS Data Warehouse, there are no potential liquefaction areas ~~within~~on the project site. Furthermore, according to the findings of the Ninyo & Moore evaluation, due to the dense nature of the underlying granitic rock at the site, liquefaction is not a design consideration.

Landslides

Landslides can be caused by ground shaking from an earthquake or surface water flow from rainfall, septic systems, landscaping, or other origins that infiltrate slopes with unstable material. The potential for a landslide to occur depends on an area's geologic formations, topography, ground shaking potential, and surface development or improvements. Based on the County of San Diego General Plan EIR (2007a), the project site is not located within a landslide susceptibility area. Furthermore Ninyo & Moore's evaluation noted that landslides or indications of deep-seated landsliding are not underlying the project site. Therefore, the potential for significant large-scale slope instability at the site is not a design consideration.

4.7.2.3 Soil Setting

Expansive soils generally result from specific clay minerals that have the capacity to shrink or swell in response to changes in moisture content. Shrinking or swelling of foundation soils can lead to damage to foundations and engineered structures, including tilting and cracking. According to the Soil Survey of San Diego County, the soils underlaying the project site are identified as Bosanko stony clay, 5 to 9% slopes. Bosanko stony clay is categorized has having "high" shrink-swell behavior by the Soil Survey for the San Diego Area, prepared by the U.S. Department of Agriculture, Soil Conservation and Forest Service dated December 1973. This categorization indicates the project site is located on expansive soils. Concurrently, the Ninyo & Moore evaluation included laboratory testing of the topsoil, which determined it possesses a medium to high potential for expansion. In addition, Bosanko stony clay is considered to have moderate erodibility (USDA 1973). The Ninyo & Moore evaluation also identified the onsite soils as being susceptible to erosion.

4.7.2.4 Paleontological Setting

Paleontological resources (fossils) are the remains and/or traces of prehistoric life and represent an important and nonrenewable natural resource. Fossil remains are found in the geologic units (i.e., formations) within which they were originally buried. Fossils or fossil deposits are generally regarded as ~~being~~ older than 11,700 years, ~~which is~~ the generally accepted temporal boundary

marking the end of the last late-Pleistocene glacial event and the beginning of the current period of climatic amelioration of the Holocene.

A geologic formation is a body of rock identified by its lithic characteristics (e.g., grain size, texture, color, mineral content) and stratigraphic position. Formations are mappable at the Earth's surface or traceable in the subsurface and are formally named and described in the geologic literature. The fossil content may also be a characteristic of a formation. There is a direct relationship between fossils and the geologic formations within which they are enclosed; therefore, with sufficient knowledge of the geology and stratigraphy of a particular area and the paleontological resource potential, it is possible to reasonably predict where fossils might or might not be found. This is the case in San Diego County where a general overview of the geologic setting provides a basis for reasonably predicting the location of paleontological resources.

A unique paleontological resource is any fossil or assemblage of fossils, or paleontological resource site~~,~~ or formation that meets any one of the following criteria (County of San Diego 2009):

- The best example of its kind locally or regionally.
- Illustrates a paleontological or evolutionary principle (e.g., faunal succession; plant or animal relationships).
- Provides a critical piece of paleobiological data (illustrates a portion of geologic history or provides evolutionary, paleoclimatic, paleoecological, paleoenvironmental, or biochronological data).
- Encompasses any part of a "type locality" of a fossil or formation.
- Contains a unique or particularly unusual assemblage of fossils.
- Occupies a unique position stratigraphically within a formation.
- Occupies a unique position, proximally, distally or laterally within a formation's extent or distribution.

A paleontological record search was conducted by the San Diego Natural History Museum (SDNHM) on May 25, 2021 (SDNHM 2021) to determine the geologic units underlying each planning district and to identify any recorded fossil collection localities at or in the vicinity of each planning district. The results of the record search indicate that the project site is underlain by several geologic units including Cretaceous-age Lusardi Formation, Cretaceous-age intrusive igneous rocks, and Mesozoic-age metavolcanic and metasedimentary rocks. The Cretaceous-age Lusardi Formation underlies the southern and western portions of the project site and portions of the potential new sewer line along South Grade Road in the vicinity of Calle de Compadres, and along Tavern Road in the vicinity of Joan MacQueen Middle School. The Lusardi Formation is assigned a moderate paleontological sensitivity based on its sedimentary origin, late Cretaceous age, and limited fossil record.

Cretaceous-age intrusive igneous rocks underlie the northern portion of the project site and the majority of the potential sewer line. These rocks comprise part of the northern end of the Peninsular Ranges Batholith. Plutonic igneous rocks do not preserve fossils because they crystallize at extremely high temperatures and pressures several miles below the Earth's surface. Consequently, these rocks are assigned no paleontological sensitivity.

Based on the SDNHM record search, crystalline basement rocks of Jurassic to Cretaceous age (possibly 150 to 130 million years old), mapped as undifferentiated metavolcanic and

metasedimentary rocks by Todd (2004), underlie a portion of the potential sewer line along South Grade Road, in the vicinity of Big Wagon Road and Deland Drive. The metavolcanic portions of this unit rarely preserve fossils due to the high temperatures associated with their formation, although some of the volcanic breccias have produced petrified wood. The metasedimentary portions have the potential to yield fossils, including siliceous microfossils (e.g., radiolarians) and marine macroinvertebrates (e.g., clams and belemnites). The lack of nearby localities from these deposits indicates that fossil recovery is unlikely, so the geologic unit as a whole is assigned a low paleontological sensitivity in the vicinity of the project site**.**

The SDNHM paleontological collection records search did not find any recorded fossil localities within 1 mile of the project site.

4.7.3 Applicable Laws and Regulations

4.7.3.1 Federal

Occupational Safety and Health Act of 1970

The Occupational Safety and Health Act establishes the framework for safe and healthful working conditions for working men and women by authorizing enforcement of the standards developed under the act. The act assigns the Occupational Safety and Health Administration (OSHA) two regulatory functions: setting standards and conducting inspections to ensure that employers are providing safe and healthful workplaces. OSHA standards may require that employers adopt certain practices, means, methods, or processes reasonably necessary and appropriate to protect workers on the job. Employers must become familiar with the standards applicable to their establishments and eliminate hazards.

Compliance with standards may include implementing engineering controls to limit exposures to physical hazards and toxic substances, implementing administrative controls, and ensuring that employees have been provided with, have been effectively trained on, and use personal protective equipment when required for safety and health, where the former controls cannot be feasibly implemented. Employees must comply with all rules and regulations that apply to their own actions and conduct. Even in areas where OSHA has not set forth a standard addressing a specific hazard, employers are responsible for complying with the act's "general duty" clause. The general duty clause (Section 5(a)(1)) states that each employer "shall furnish…a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."

Regulations defining safe standards have been developed for general industry, construction, maritime, recordkeeping, and agriculture. OSHA standards specific to safety and health regulations pertaining to construction are listed in 29 Code of Federal Regulations (CFR) 1926, Subtitle B. Specifically, subpart C handles general safety and health provisions including safety training and education, first aid and medical attention, fire protection and prevention, and personal protective equipment. Subpart D is specific to occupational health and environmental controls such as radiation, gases/vapors/fumes/dust, lead, hazardous chemicals, and noise exposure. Subpart P handles excavation work and safety. Subparts Q and R handle concrete/masonry and steel structures, respectively. In addition, several more subparts provide additional requirements.

4.7.3.2 State

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Act (Public Resources Code [PRC] 2621 et seq.) was enacted by the State of California in 1972.[1] The Alquist-Priolo Act's primary purpose is to prohibit the construction of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults. It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to active faults. In addition, the Alquist-Priolo Act requires the State Geologist to establish regulatory zones, known as "earthquake fault zones," around the surface traces of active faults and to issue appropriate maps to assist cities and counties in planning, zoning, and building regulation functions. Maps are distributed to all affected cities and counties for the controlling of new or renewed construction and are required to sufficiently define potential surface rupture or "fault creep.". The State Geologist is charged with continually reviewing new geologic and seismic data and revising existing zones and delineating additional earthquake fault zones when warranted by new information. According to the Alquist-Priolo Act, before a project can be permitted, cities and counties shall require a geologic investigation, prepared by a licensed geologist, to demonstrate that buildings will not be constructed across active faults. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back. Although setback distances may vary, a minimum 50-foot setback is required.

Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if the faults are considered "sufficiently active" and "well-defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for the purposes of the act as within the last 11,000 years). A fault is considered well-defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment.

International Building Codes

Development and building design standards, implemented through the California Building Code (CBC), require the project to comply with appropriate seismic design criteria in the International Building Code, adequate drainage facility design, and preconstruction soils and grading studies. Seismic design standards have been established to reduce many of the structural problems occurring because of major earthquakes. In 1998, the code was revised as follows.

- Upgrade the level of ground motion used in the seismic design of buildings.
- Add site amplification factors based on local soils conditions.
- Improve the way ground motion is applied in detailed design.

California Building Code

The California Code of Regulations, Title 24 (California Building Code or CBC) applies to all applications for building permits. The CBC (also called the California Building Standards Code) has incorporated the International Building Code, which was first enacted by the International

[1] The act was originally titled the Alquist-Priolo Geologic Hazards Zone Act.

Conference of Building Officials in 1927 and has been updated approximately every 3 years since that time. The current version of the CBC (2019) became effective on January 1, 2020. Building codes provide minimum standards regulating a number of aspects of construction that are relevant to geology and geologic hazards. Title 24, Part 2 of the CBC provides building codes and standards for the design and construction of structures in California. The CBC requires, among other things, seismically resistant construction and foundations~~,~~ and soil investigations prior to construction. The CBC also establishes grading requirements that apply to excavation and fill activities, and requires the implementation of erosion control measures.

The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. In addition, the CBC contains necessary California amendments, which are based on the American Society of Civil Engineers (ASCE) Minimum Design Standards 7-05. ASCE 7-05 provides requirements for general structural design and includes means for determining earthquake loads as well as other loads (flood, wind, etc.) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and~~/or~~ demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements of the CBC take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients, which are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E/F (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the SDC. The project would be required to comply with the CBC, including Part 2, Volume 2, Chapter 18, Soils and Foundations, which outlines the minimum standards for structural design and construction. This includes the preparation of geotechnical evaluations, which among other requirements, include a record of the soil profile, regulation of active faults in the area, recommendations for foundation type and design criteria that address issues, as applicable, such as (but not limited to) bearing capacity of soils, provisions to mitigate the effects of expansive soils, liquefaction, settlement, and varying soil strength. Section 1803.1.1.3 of Chapter 18 states that if a building department, or other appropriate enforcement agency, determines that recommended action(s) presented in the geotechnical evaluations are likely to prevent structural damage, the approved recommended action(s) must be made a condition to the building permit (Section 1803.1.1.3 of Chapter 18).

The CBC also provides standards for various aspects of construction, including but not limited to excavation, grading, and earthwork construction; preparation of the site prior to fill placement, specification ~~of~~on fill materials and fill compaction and field testing; retaining wall design and construction; foundation design and construction; and seismic requirements. It includes provisions to address issues such as (but not limited to) construction on expansive soils, liquefaction potential, and soil strength loss. The CBC sets seismic design requirements based on seismic risk categories, which are associated with a structure's occupancy category (i.e., structures that represent low hazard to human life, structures that represent substantial hazard to human life, structures designated as essential facilities based on the proposed use), and a structure's seismic risk category (i.e., the severity of the design earthquake ground motion and specific soil properties at the site). In accordance with California law, project design and construction would be required to comply with

provisions of the CBC. Local agencies must ensure that development in their jurisdictions complies with guidelines contained in the CBC. Cities and counties can, however, adopt building standards beyond those provided in the code.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (PRC 2690–2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: the ~~s~~State is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards; and cities and counties are required to regulate development within mapped seismic hazard zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Under PRC 2697, cities and counties must require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard. Each city or county must submit one copy of each geotechnical report, including mitigation measures, to the State Geologist within 30 days of its approval.

Construction General Permit (Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ and Order 2012-006-DWQ)

Construction activities that disturb 1 acre or more of land must obtain coverage under the State Water Resources Control Board (SWRCB) Construction General Permit (Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ and Order 2012-006-DWQ).[2] Under the terms of the permit, applicants must file complete and accurate Notice of Intent and Permit Registration Documents with the SWRCB. Applicants must also demonstrate conformance with applicable construction best management practices (BMPs) and prepare a construction Storm Water Pollution Prevention Plan (SWPPP) containing a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. BMPs include but are not limited to silt fences, straw waddles, sediment traps, and gravel sandbag barriers.

California Public Resources Code

PRC Section 5097.5 addresses paleontological resources and states that ~~"~~no person shall "knowingly and willfully excavate~~,~~ upon, or remove, destroy, injure, or deface" any "vertebrate paleontological site, including fossilized footprints~~,~~," or any other paleontological feature situated~~"~~ on public lands without the "express permission of the public agency having jurisdiction over the lands." Violation of this section is a misdemeanor.

As used in PRC 5097.5, *public lands* means lands owned by or under the jurisdiction of the ~~s~~State or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, public agencies are required to comply with PRC 5097.5 for their own activities, including

[2] For additional details, please see the SWRCB Orders, which are available online at: https://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others.

4.7.3.3 Local

County of San Diego ~~Municipal Code~~Code of Regulatory Ordinances Section 87.201-87.218

~~Municipal~~ Code ~~Section 87.201-87.218~~

~~Municipal Code~~of Regulatory Ordinances Section 87.201-87.218 outlines the regulations for Grading Permits. No grading may occur without a valid, unexpired grading permit issues by the County Official, except for exemptions from permit requirement as outlined in this ~~Municipal~~Regulatory Ordinance Code. The ~~Municipal~~Regulatory Ordinance Code also provides standards for major and minor grading, and specific standards for grading as applicable to biological resources.

County of San Diego General Plan

The Conservation Element of the County ~~of San Diego~~ General Plan provides policies for the protection of natural resources. These policies provide guidance for the preservation of unique geological features.

4.7.4 Project Impact Analysis

4.7.4.1 Methodology

The analysis approach considers the existing geologic and soil conditions established in Section 4.7.2, *Existing Conditions*, and the applicable laws and regulations pertaining to geologic hazards and soils described in Section 4.7.3, *Applicable Laws and Regulations*, in order to determine the project's potential to directly or indirectly cause substantial adverse effects related to a hazardous geologic condition or event. The analysis draws on data from Ninyo & Moore's *Geotechnical Evaluation*.

This analysis is consistent with CEQA: an EIR is not required to analyze how existing environmental conditions would affect a project's residents or users unless the project would exacerbate those conditions. Therefore, when discussing impacts from the environment on the project, such as how a fault rupture or soil condition may affect a project, the analysis will first determine if there is a potential for the project to exacerbate the issue.

4.7.4.2 Thresholds of Significance

Appendix G of the ~~State~~ CEQA Guidelines

The following significance criteria are based on Appendix G of the ~~State~~ CEQA Guidelines and provide the basis for determining significance of impacts from geotechnical hazards and soil conditions associated with the implementation of the project.

Impacts are considered significant if the project would result in any of the following:

1. 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; (iv) landslides.
2. Result in substantial soil erosion or the loss of topsoil.
3. 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 off-site lateral spreading, subsidence, or collapse.
4. 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.
5. Have soils that would be incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?
6. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

County of San Diego Guidelines for Determining Significance

The following significance criteria are based on the *County of San Diego Guidelines for Determining Significance for Geologic Hazards* (County of San Diego 2007b). Impacts are considered significant if the project would result in any of the following:

Fault Rupture

a. The project proposes any building or structure to be used for human occupancy over or within 50 feet of the trace of an Alquist-Priolo fault or County Special Study Zone fault.

b. The project proposes the following uses within an AP Zone which are prohibited by the County:

i. Uses containing structures with a capacity of 300 people or more. Any use having the capacity to serve, house, entertain, or otherwise accommodate 300 or more persons at any one time.

ii. Uses with the potential to severely damage the environment or cause major loss of life. Any use having the potential to severely damage the environment or cause major loss of life if destroyed, such as dams, reservoirs, petroleum storage facilities, and electrical power plants powered by nuclear reactors.

iii. Specific civic uses. Police and fire stations, schools, hospitals, rest homes, nursing homes, and emergency communication facilities.

Ground Shaking

a. The project site is located within a County Near-Source Shaking Zone or within Seismic Zone 4 and the project does not conform to the Uniform Building Code (UBC).

Liquefaction

a. The project site has potential to expose people or structures to substantial adverse effects because:

i. The project site has potentially liquefiable soils; and

ii. The potentially liquefiable soils are saturated or have the potential to become saturated; and

iii. In-situ soil densities are not sufficiently high to preclude liquefaction.

Landslides

a. The project site would expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving landslides.

b. The project is located on a geologic unit or soil that is unstable, or would become unstable as a result of the project, potentially resulting in an on- or off-site landslide.

c. The project site lies directly below or on a known area subject to rockfall which could result in collapse of structures.

Expansive Soils

The project is located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), and does not conform with the Uniform Building Code.

4.7.4.3 Project Impacts and Mitigation Measures

Threshold 1: Implementation of the project would not 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.

County Park and Trails and Open Space~~/Preserve~~

Impact Discussion

Based on the Ninyo & Moore review of the referenced geologic maps and site reconnaissance, no faults are mapped as underlying the project site. Additionally, the site is not located within a State of California Earthquake Fault Zone (formerly known as Alquist-Priolo Special Studies Zone). The nearest known active fault is the Elsinore fault, approximately 21 miles to the east of the site. However, because the project site is located within a seismically active region, it is possible ground-shaking as a result of seismic activity could occur on the project site. Despite the potential for ground-shaking, the project site is not within a potential liquefaction area or landside susceptibility area.

Construction

Construction of the project would include grading, excavation, and building and paving activities, utilizing tractors, excavators, backhoes, a water truck, a drill rig, a bobcat, a forklift, rollers, a rubber tire loader, wheel tractor scrapers, an air compressor, a generator set, a crane, and a concrete truck.

Construction activities would include earthwork such as grading and excavation, but would not include any activities~~,~~ such as natural resource extraction, that have the potential to directly or indirectly result in substantial adverse effects related to rupture of a known earthquake fault. Similarly, while the project is located in a seismically active region, the project would not involve any construction activities that would exacerbate the adverse effects of strong seismic ground-shaking at the project site. Because there are no existing topographic or soil conditions on the project site that would result in the potential for liquefaction or landslide hazards, the project would not exacerbate potential risks associated with th~~o~~ese geologic hazards. Furthermore, construction of the project would comply with all applicable laws and regulations, including the building codes identified in Section 4.7.3 above, and the recommendations of the *Geotechnical Evaluation*, which are based on Ninyo & Moore's evaluation of the site geotechnical conditions (see *Threshold 3*). The recommendations include suggested procedures for grading and building activities as well as design guidelines to address seismic conditions, consistent with applicable building codes and local regulations.

Operation

As mentioned, the project would not be located within the area of potential risk for fault rupture, liquefaction, or landslide. Operation of the project would consist of a park for daily visitors~~, one onsite~~ and include a live-on volunteer, ~~and~~maintenance staff, and park rangers to help with maintenance and management of the property. Operational activities would include passive and active recreation, which do not have the potential to result in direct or indirect effects related to a fault condition leading to a rupture or strong seismic ground shaking. Furthermore, the proposed structures would be engineered and built in compliance with applicable laws and regulations as required by the CBC, as well as the specific recommendations for the site provided by the *Geotechnical Evaluation* intended to ensure structures would not result in substantial adverse effects related to fault rupture, ground-shaking, liquefaction, or landslides.

Impact Determination

Implementation of the project would not directly or indirectly cause potential substantial adverse effects related to the potential rupture of a known earthquake fault, strong seismic ground shaking, or seismic-related ground failure, such as liquefaction, or landslides. Therefore, no significant impacts would occur.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant.

Threshold 2: The project would not result in substantial soil erosion or the loss of topsoil.

County Park and Trails and Open Space~~/Preserve~~

Impact Discussion

Construction

~~The *Geotechnical Evaluation* identified the onsite soils as susceptible to erosion.~~ Erosion or the loss of topsoil can occur due to changes in drainage patterns, changes in filtration or impervious surfaces, or an increase in stormwater runoff. Construction activities would develop the existing undeveloped site that does not currently contain any structures, impervious surfaces, or infrastructure, into a park with structures, paved surfaces, and landscaping. During construction of the project, stormwater drainage patterns could be temporarily altered due to site grading, preparation activities, and excavation, resulting in potential temporary erosion or loss of topsoil. In addition, the *Geotechnical Evaluation* identified the onsite soils as susceptible to erosion. The project would disturb over 1 acre of land; therefore, it would be required to obtain an NPDES General Construction Permit from the SWRCB. Compliance with the General Construction Permit would require the preparation of a SWPPP for the project site. The SWPPP would identify potential pollutants and outline the BMPs that would be implemented during construction activities to prevent soil erosion and discharge of potential pollutants to water resources. Additionally, a Stormwater Quality Management Plan (SWQMP) would be prepared for the project site consistent with the requirements of the *County of San Diego BMP Design Manual*, which would contain site-specific design measures, source control, and/or treatment control BMPs such as landscaped areas, berms, and stormwater retention basins to reduce potential pollutants, including sediment from erosion or siltation, to the maximum extent practicable from entering stormwater runoff. Please see Section 4.10, *Hydrology and Water Quality,* for further information about the requirements of the SWPPP, SWQMP, and *County of San Diego BMP Design Manual*, as well as further discussion of potential water quality impacts related to erosion. County DPR would ensure that the project is implemented as proposed (in compliance with County of San Diego Watershed Protection Ordinance and regional MS4 Permit), which would ensure the project would not result in significantly increased erosion or sedimentation potential, and would not alter any drainage patterns of the site or area on- or off site.

Operation

Operation of the project would include several new impervious surfaces as part of the parking areas, restroom facilities, administrative facility/ranger station, basketball courts, pickleball courts, ~~skate~~all-wheel park, bike skills area, and entrance/exit driveways. All other project components (equestrian staging, dog park, fields, and trails) would be construct~~ion~~ed with pervious materials. Impervious surfaces can result in an increase in erosion or topsoil loss because they prevent infiltration of rainwater and can change the drainage patterns of previous undeveloped land. As discussed in the construction analysis, a SWQMP would be prepared for the project, which would include operational BMPs such as site-specific design measures, source control, and/or treatment control BMPs to ensure sediment does not erode from the project site. Additionally, a stormwater retention basin is proposed as part of the project design, located in the southern, down-slope portion of the project site. The retention basin would serve to manage and treat stormwater and

reduce stormwater runoff that could cause soil erosion. The Ninyo & Moore *Geotechnical Evaluation* identified the onsite soils as susceptible to erosion and provided a recommendation for design features to mitigat~~ion~~e erosion on the project site. County DPR would incorporate the recommendations into the project implementation. Therefore, with the implementation of the operational BMPs and the Ninyo & Moore recommendations, as well as compliance with applicable regulations for managing stormwater runoff and erosion (see also *Applicable Laws and Regulations* in Section 4.10), the project would not result in substantial soil erosion or loss of topsoil.

Impact Determination

The project would not result in substantial soil erosion or loss of topsoil. Impacts would be less than significant.

Mitigation Measures

No mitigation would be required.

Level of Significance After Mitigation

Impacts would be less than significant.

Threshold 3: The project would not 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 off-site lateral spreading, subsidence, or collapse.

County Park and Trails and Open Space~~/Preserve~~

Impact Discussion

Construction

The Ninyo & Moore evaluation concluded the project site contained loose topsoil materials that are unsuitable for structural support in their present condition. Ninyo & Moore provided recommendations for remedial grading of these materials to prepare the site for construction. The recommendations include the following:

- **Site Preparation.** Site preparation should begin with the removal of existing improvements, vegetation, utility lines, asphalt, concrete, and other deleterious debris from areas to be graded. Tree stumps and roots should be removed to such a depth that organic material is generally not present. Clearing and grubbing should extend to the outside of the proposed excavation and fill areas. The debris and unsuitable material generated during clearing and grubbing should be removed from areas to be graded and disposed of at a legal dumpsite away from the project area, unless noted ~~otherwise in [the report].~~
- **Excavation Characteristics.** Onsite excavations will encounter very difficult excavation conditions due to the presence of bedrock materials, boulders, and/or corestones. The contractor should be prepared for the use of heavy ripping, rock breaking, rock coring, and/or blasting techniques to perform onsite excavations. Additionally, onsite excavations will generate oversize materials that should be screened, rockpicked, crushed, removed, or otherwise processed from the excavated materials prior to reuse as compacted fill.

- **Temporary Excavations.** For temporary excavations, ~~it is recommended~~Ninyo & Moore recommends that the following Occupational Safety and Health Administration (OSHA) soil classifications be used:

Topsoil	Type C
Granitic Rock	Type B

  Upon making the excavations, the soil classifications and excavation performance should be evaluated in the field in accordance with the OSHA regulations. Temporary excavations should be constructed in accordance with OSHA recommendations. For trench or other excavations, OSHA requirements regarding personnel safety should be met using appropriate shoring (including trench boxes) or by laying back the slopes to a slope ratio no steeper than 1½:1 (horizontal to vertical) in topsoil and 1:1 in granitic rock. Temporary excavations that encounter seepage may require shoring or may be stabilized by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis. Onsite safety of personnel is the responsibility of the contractor.

- **Remedial Grading – Structural Buildings.** Based on the results of ~~our~~ laboratory testing presented in Appendix F, the existing topsoil possesses a medium to high potential for expansion. To mitigate for the effects of highly expansive onsite soils, ~~it is recommended that~~we recommend the performance of the following remedial grading measures for buildings ~~be employed~~. Furthermore, recommendations to support the structures on deepened foundations, in conjunction with these remedial grading recommendations, are presented in following sections of this report. We recommend that the existing near-surface topsoil within the building pad be removed down to competent decomposed granitic rock or 1 foot below the bottom of footings, whichever is deeper. This overexcavation should extend to the horizontal limits of the building pad. For the purposes of this report, the building pad is defined as the structural footprint (including foundations for attached overhangs, canopies, and other building appurtenances) plus a horizontal distance of 5 feet, where feasible. The lateral extents of the overexcavation may be modified in the field based on site constraints, such as property lines. The extent and depths of removals and overexcavations should be evaluated by Ninyo & Moore's representative in the field based on the materials exposed. Subsequent to performance of the overexcavation removal, the resulting surface should be scarified to a depth of approximately 6 inches, moisture conditioned, and recompacted to a relative compaction of 90 percent as evaluated by the ASTM D 1557 prior to placing new fill. Once the resulting removal surface has been recompacted, the overexcavation should then be backfilled with compacted fill soils placed in accordance with the recommendations herein. We recommend that the upper 2 feet of compacted fill soils placed within the building pads possess a very low to low potential for expansion (i.e. an expansion index of less than 50). As noted earlier, the onsite topsoil possesses a medium to high potential for expansion and are not considered suitable for reuse within the upper 2 feet of compacted fill soils with building pads. Accordingly, the upper 2 feet of compacted fill soils within building pads may consist of import soils, soils derived from onsite excavations into the decomposed granitic rock, or lime-treatment of onsite soils.

- **Remedial Grading – Retaining Walls.** We recommend that the existing near-surface topsoil beneath retaining walls be removed down to a depth of 1 foot below the bottom of the retaining wall foundations. This overexcavation should extend a lateral distance of 1 foot beyond the horizontal limits of the foundation. The lateral extents of the overexcavation may be modified in the field based on site constraints. The extent and depths of removals and overexcavations

should be evaluated by Ninyo & Moore's representative in the field based on the materials exposed. Subsequent to performance of the overexcavation removal, the resulting surface should be scarified to a depth of approximately 6 inches, moisture conditioned, and recompacted to a relative compaction of 90 percent as evaluated by the ASTM D 1557 prior to placing new fill. Once the resulting removal surface has been recompacted, the overexcavation should then be backfilled with compacted fill soils placed in accordance with the recommendations herein. We recommend that the upper 1 foot of compacted fill soils placed beneath retaining walls possess a very low to low potential for expansion (i.e., an expansion index of less than 50). As noted earlier, the onsite topsoil possesses a medium to high potential for expansion and are not considered suitable for reuse within the upper 1 foot of compacted fill soils beneath retaining walls. Accordingly, the upper 1 foot of compacted fill soils beneath retaining walls may consist of import soils, soils derived from onsite excavations into the decomposed granitic rock, or lime-treatment of onsite soils.

- **Remedial Grading – Exterior Pedestrian Concrete Flatwork.** We recommend that the existing near-surface topsoil beneath exterior pedestrian concrete flatwork be removed down to a depth of 2 feet below the planned finished subgrade elevation. This overexcavation should extend a lateral distance of 1 foot beyond the horizontal limits of the flatwork. The lateral extents of the overexcavation may be modified in the field based on site constraints. The extent and depths of removals and overexcavations should be evaluated by Ninyo & Moore's representative in the field based on the materials exposed. Subsequent to performance of the overexcavation removal, the resulting surface should be scarified to a depth of approximately 6 inches, moisture conditioned, and recompacted to a relative compaction of 90 percent as evaluated by the ASTM D 1557 prior to placing new fill. Once the resulting removal surface has been recompacted, the overexcavation should then be backfilled with compacted fill soils placed in accordance with the recommendations herein. We recommend that the upper 2 feet of compacted fill soils placed beneath exterior pedestrian flatwork possess a very low to low potential for expansion (i.e. an expansion index of less than 50). As noted earlier, the onsite topsoil possesses a medium to high potential for expansion and are not considered suitable for reuse within the upper 2 feet of compacted fill soils beneath exterior pedestrian flatwork. Accordingly, the upper 2 feet of compacted fill soils beneath exterior pedestrian flatwork may consist of import soils, soils derived from onsite excavations into the decomposed granitic rock, or lime-treatment of onsite soils.
- **Materials for Fill.** Materials for fill may be processed from onsite excavations or may consist of import materials. Onsite soils with an organic content of less than approximately 3 percent by volume (or 1 percent by weight) are suitable for reuse as general fill material. Fill soils should be free of trash, debris, roots, vegetation, organics, or other deleterious materials. Due to the shallow groundwater moisture conditioning of onsite materials, including drying and/or aerating, should be anticipated. Fill and utility trench backfill materials should not contain rocks or lumps over 3 inches, and not more than 30 percent larger than ¾ inch. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces or disposed of offsite. As noted earlier, expansion index testing presented in Appendix F indicates that some of the onsite topsoil possesses a medium to high potential for expansion. Soils that possess a medium to high potential for expansion (i.e., an expansion index of 50 or more) are not suitable for reuse within the upper 2 feet of building pads, in the upper 1 foot beneath retaining wall footings, as retaining wall backfill, or as the upper 2 feet of subgrade soils beneath pedestrian concrete flatwork. Imported fill material should generally be granular soils with a very low to low

expansion potential (i.e., an expansion index of 50 or less). Import fill material should also be non-corrosive in accordance with the Caltrans amended (2019) AASHTO (2017) corrosion criteria. Non-corrosive soils are soils that possess an electrical resistivity more than 1,100 ohm-centimeters (ohm-cm), a chloride content less than 500 parts per million (ppm), less than 0.15 percent sulfates, and a pH less than 5.5. Materials for use as fill should be evaluated by Ninyo & Moore's representative prior to filling or importing. To reduce the potential of importing contaminated materials to the site, prior to delivery, soil materials obtained from off-site sources should be sampled and tested in accordance with standard practice (DTSC, 2001). Soils that exhibit a known risk to human health, the environment, or both, should not be imported to the site.

- **Compact Fill.** Prior to placement of compacted fill, the contractor should request an evaluation of the exposed ground surface by Ninyo & Moore. Unless otherwise recommended, the exposed ground surface should then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve moisture contents generally at or slightly above the optimum moisture content. The scarified materials should then be compacted to a relative compaction of 90 percent as evaluated in accordance with the ASTM D 1557. The evaluation of compaction by the geotechnical consultant should not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify this office and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review. Fill materials should be moisture conditioned to generally at or slightly above the laboratory optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils should be generally consistent within the soil mass. Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill should be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction. Compacted fill should be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift should be watered or dried as needed to achieve a moisture content generally at or slightly above the laboratory optimum, mixed, and then compacted by mechanical methods to a relative compaction of 90 percent as evaluated by ASTM D 1557. The upper 12 inches of the subgrade materials beneath vehicular pavements should be compacted to a relative compaction of 95 percent relative density as evaluated by ASTM D 1557. Successive lifts should be treated in a like manner until the desired finished grades are achieved.
- **Slopes.** We anticipate that new cut and fill slopes will be constructed for the project. Unless otherwise recommended by our offices and approved by the regulating agencies, permanent cut and fill slopes should not be steeper than 2:1 (horizontal to vertical). Buildings, structures, and improvements should be set back from the top of slopes in accordance with the 2019 CBC. We recommend buildings and structures be set back 20 feet or more from the top of slopes. Compaction of the face of fill slopes should be performed by backrolling at intervals of 4 feet or less in vertical slope height, or as dictated by the capability of the available equipment, whichever is less. Fill slopes should be overbuilt and cut back to finish grades. The placement, moisture conditioning, and compaction of fill slope materials should be done in accordance with the recommendations presented herein. Site runoff should not be permitted to flow over the tops of slopes. Positive drainage should be established away from the top of slopes. This may be accomplished by utilizing brow ditches placed at the top of slopes to divert surface runoff away from the slope face where drainage devices are not otherwise available. The onsite soils are

susceptible to erosion. The project plans and specifications should contain design features and construction requirements to mitigate erosion of soils or contain a maintenance program to redress erosion features as they develop on a periodic basis.

- **Pipe Bedding and Modulus of Soil Reaction (*E'*).** It is our recommendation that new pipelines (pipes), where constructed in open excavations, be supported on 6 or more inches of granular bedding material. Granular pipe bedding should be provided to distribute vertical loads around the pipe. Bedding material and compaction requirements should be in accordance with this report. Pipe bedding typically consists of graded aggregate with a coefficient of uniformity of three or greater.

The recommendations from the Ninyo & Moore *Geotechnical Evaluation* would address any potential substantial issue associated with unstable soils during project construction.

Operation

Although the project site is located on unstable soils, operation of the project would include passive and active recreation; it would not include any activities that would result in ground disturbance, significant erosion, or landslides, that could cause hazardous conditions such as subsidence or collapse of the project site.

Impact Determination

The project would not be located on a geologic unit that is unstable. The project would be located on soil that is unstable, but the project would not exacerbate the condition. With the implementation of the Ninyo & Moore *Geotechnical Evaluation* recommendations as well as adherence to applicable laws and regulations, including the requirements of the CBC, project construction would not result in a geologic unit or soils that would become unstable as a result of the project, and potentially result in on- or offsite lateral spreading, subsidence, or collapse. The impact would be less than significant.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

The impact would be less than significant.

Threshold 4: The project would not 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.

County Park and Trails and Open Space~~/Preserve~~

Impact Discussion

Construction and Operation

As discussed above, the project site is underlain by Bosanko Stony clay which is categorized as having high shrink-swell behavior. The laboratory testing conducted by Ninyo & Moore confirmed the soil on site has a medium to high potential for expansion. Construction on expansive soils can cause damage to structures and even create hazards for people inhabiting structures because as soils expand or contract they can cause distress to structures or foundations, and can lead to cracking, or tilting. Construction of the project would be conducted in compliance with the regulations of the CBC and the County Code of ~~San Diego Municipal Code~~Regulatory Ordinances regulations for grading, earthwork, and construction. In addition, the project would implement the recommendations put forth by the Ninyo & Moore *Geotechnical Evaluation*, as described in the analysis for Threshold 3, above. These site-specific recommendations, as well as further engineering recommendations to support the structures on deepened foundations, would ensure the appropriate procedures and engineering techniques are followed during construction to diminish potential risks associated with construction on the onsite expansive soils, and would also ensure the project would not exacerbate existing onsite conditions. Furthermore, operations of the project would not involve any activities that would exacerbate the existing expansive soils onsite.

Impact Determination

The project would be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, but would not create substantial direct or indirect risks to life or property. Impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

The impacts would be less than significant.

Threshold 5: Implementation of the project would not involve soils incapable of adequately supporting the use of septic tanks or alternative ~~waste water~~wastewater disposal systems where sewers are not available for the disposal of ~~waste water~~wastewater.

County Park and Trails and Open Space~~/Preserve~~

Impact Discussion

Construction and Operation

The project is proposing two options for sewage disposal: (1) connecting to the existing public sewer line within Tavern Road or the existing sewer line within the northern portion of South Grade Road, or (2) installing an onsite sewer treatment system in the northern portion of the project. The second option would be a septic system with a filter treatment system and treatment leach field. The project is underlain by Bosanko stony clay, which is rated as "severe" for septic tank effluent disposal due to permeability rate (USDA 1973). Projects with a discharge of wastewater must conform to the Regional Water Quality Control Board's (RWQCB's) applicable standards, including the Regional Basin Plan and the California Water Code (see Section 4.10 for further description of these regulations). California Water Code Section 13282 allows RWQCBs to authorize a local public agency to issue permits for on-site wastewater systems (OSWS) "to ensure that systems are adequately designed, located, sized, spaced, constructed and maintained." The RWQCBs with jurisdiction over San Diego County have authorized the County ~~of San Diego~~, Department of Environmental Health ~~(DEH~~and Quality (DEHQ) to issue certain OSWS permits throughout the County and within the incorporated cities. DEHQ would review the OSWS layout for the project pursuant to DEHQ, Land and Water Quality Division's, *On-site Wastewater Systems: Permitting Process and Design Criteria*. Therefore, the project site would be evaluated by the authorized, local public agency for a determination of the suitability of onsite soils for the proposed septic system. In addition, the project would comply with the San Diego County Code of Regulatory Ordinances, Title 6, Division 8, Chapter 3, Septic Tanks and Seepage Pits, which regulates the use of septic systems in San Diego County.

Impact Determination

The project would not involve soils incapable of adequately supporting the use of septic tanks or alternative ~~waste water~~wastewater disposal systems where sewers are not available for the disposal of ~~waste water~~wastewater. The construction and operation of a septic system as part of the project would comply with the existing regulations and approval process and would not result in a significant impact related to onsite soils unsuitable for septic systems. Impacts would be less than significant.

Mitigation Measures

No mitigation is required.

Level of Significance After Mitigation

Impacts would be less than significant.

Threshold 6: The project would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

County Park and Trails and Open Space~~/Preserve~~

Impact Discussion

~~Based~~As discussed in Section 4.5, *Cultural Resources*, based on the results of the records search performed by the SDNHM, portions of the project site, including the Tavern Road sewer line option are underlain by geologic units assigned low or no paleontological potential. The southern and western portions of the project site and portions of the South Grade Road sewer line option are underlain by a geologic unit with moderate paleontological sensitivity. No recorded fossil localities were identified within 1 mile of the project site.

Construction

The primary type of activities that directly destroy a unique paleontological resource or site are those that are ground disturbing. Construction of the project would include ground-disturbing activities such as grading and excavation. As described above, portions of the project site, including the potential Tavern Road sewer line option are underlain by geologic units assigned low or no paleontological potential. In these areas, construction is unlikely to result in impacts on paleontological resources; thus, impacts would be less than significant. However, the southern and western portions of the project site and portions of the potential South Grade Road sewer line option are underlain by a geologic unit with moderate paleontological sensitivity. Due to this sensitivity, ground-disturbing construction activities could result in impacts on paleontological resources (**Impact-GEO-1**). Any proposed excavation activities that extend deep~~ly~~ enough to encounter previously undisturbed deposits of the Lusardi Formation have the potential to ~~encounter and then potentially~~ impact the paleontological resources possibly preserved therein. In these areas, construction activities are expected to include grading, digging, and excavation to prepare the site, build the active recreation facilities, and build the parking lots and infrastructure; as well as building the berm along the southeastern and southern boundaries of the site. ~~In order to~~To reduce the potential impact during construction activities, implementation of a paleontological resource mitigation program during ground-disturbing activities is required (**MM-GEO-1**).

Operation

Operation of the project would include active and passive recreation; there would be no ground-disturbing activities during operation. As such, operation would not disturb geologic units with moderate paleontological sensitivity, and would not result in any potential impacts on paleontological resources.

Impact Determination

The project would result in potential impacts on paleontological resources.

Impact-GEO-1: Potential Impact on Paleontological Resources. Ground-disturbing activities that would extend deep~~ly~~ enough to encounter previously undisturbed deposits of the Lusardi Formation in the southern and western portions of the project site would have the potential to impact paleontological resources.

Mitigation Measures

MM-GEO-1: Implement a Paleontological Resource Mitigation Program. Ground-disturbing construction activities in the southern and western portion of the project site shall be subject to paleontological and geologic resource sensitivity screening prior to commencement of construction. The resource sensitivity screening shall determine which ground-disturbing activities would be deep~~ly~~ enough to encounter previously undisturbed deposits of the Lusardi Formation. County DPR shall retain a Qualified Paleontologist who shall oversee paleontological monitoring by a qualified Paleontological Monitor or cross-trained Paleontological/ Archaeological monitor during ground-disturbing activities. The paleontological monitoring shall include the following measures:

- A Qualified Paleontologist shall attend the preconstruction meeting(s) to consult with the grading and excavation contractors or subcontractors concerning excavation schedules, paleontological field techniques, and safety issues.
- A Qualified Paleontologist or Paleontological Monitor or cross-trained Paleontological/ Archaeological Monitor shall be on site, on a full-time basis, during ground-disturbing activities that occur 10 feet or more below ground surface, to inspect exposures for contained fossils. The Paleontological Monitor shall work under the direction of the project's Qualified Paleontologist. A "Paleontological Monitor" shall be defined as an individual selected by the Qualified Paleontologist who has experience in monitoring excavation and the collection and salvage of fossil materials.
- If fossils are discovered on the project site, the Qualified Paleontologist shall recover them and temporarily direct, divert, or halt grading to allow recovery of fossil remains.
- The Qualified Paleontologist shall be responsible for the cleaning, repairing, sorting and cataloguing of fossil remains collected during the monitoring and salvage portion of the mitigation.
- The Qualified Paleontologist shall deposit and donate prepared fossils, along with copies of all pertinent field notes, photos, and maps, in a scientific institution with permanent paleontological collections, such as the San Diego Natural History Museum, approved by County DPR.
- Within 30 days after the completion of excavation and pile-driving activities, a final data recovery report shall be completed by the Qualified Paleontologist and submitted to County DPR for review and approval. The final report shall document the results of the mitigation and shall include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of recovered fossils.

Level of Significance After Mitigation

The implementation of **MM-GEO-1** would require the implementation of a Paleontological Resource Mitigation Program, which would prevent impacts on paleontological resources, and if fossils are unexpectedly discovered, would require the proper handling and recording of such fossils. Therefore, the implementation of **MM-GEO-1** would reduce **Impact-GEO-1** to less than significant.

4.7.5 Summary of Significant Impacts

Table 4.7-1. Summary of Significant Geology and Soils Impacts and Mitigation Measures

Summary of Potentially Significant Impact(s)	Summary of Mitigation Measure(s)	Level of Significance After Mitigation	Rationale for Finding After Mitigation
Impact-GEO-1: Potential Impact on Paleontological Resources.	**MM-GEO-1: Implement a Paleontological Resource Mitigation Program.**	Less than Significant	**MM-GEO-1** would require monitoring during ground-disturbing activities, and if fossils are discovered, would require the proper handling and recording of such fossils.