4.6 GEOLOGY AND SOILS

4.6.1 Introduction

The purpose of this section is to describe the existing regulatory and environmental conditions related to the geologic, soil, and seismic characteristics within the Beaumont Summit Station Specific Plan Project (Project). This section identifies potential impacts that could result from implementation of the Project, and as necessary, recommends mitigation measures to reduce the significance of impacts. The issues addressed in this section are risks associated with blasting, faults, strong seismic ground shaking, seismic-related ground failure such as liquefaction, landslides, substantial erosion or the loss of topsoil, and unstable geological units and/or soils.

Baseline conditions are based largely on review of the *Geotechnical Investigation* prepared by Southern California Geotechnical in August 2021 (**Appendix E**), review of aerial photographs and maps of the Project site and its surroundings and review of relevant public documents. Other relevant information, such as regulatory framework, is derived from various planning documents including, but limited to, the City of Beaumont's (City) General Plan (Beaumont 2040 GP) and Municipal Code (Beaumont MC), and pertinent State of California Building Codes.

4.6.2 Environmental Setting

Regional Geologic Setting

The Project site is located within the Peninsular Ranges province. The Peninsular Ranges province consists of several northwesterly-trending ranges in the southwestern California. The province is truncated to the north by the east-west trending Transverse Ranges. Prior to the mid-Mesozoic, the region was covered by seas and thick marine sedimentary and volcanic sequences were deposited. The bedrock geology that dominates the elevated areas of the Peninsular Ranges consists of high-grade metamorphic rocks intruded by Mesozoic plutons. During the Cretaceous, extensive mountain building occurred during the emplacement of the southern California batholith. The Peninsular Ranges have been significantly disrupted by Tertiary and Quaternary strike-slip faulting along the Elsinore and San Jacinto faults. This tectonic activity has resulted in the present terrain.

Local Geologic Setting

Southern California Geotechnical conducted subsurface exploration consisting of forty-four borings (identified as Boring Nos. B-1 through B-44) ranging from 10 to 50± feet and seven trenches (identified as Trench Nos. T-1 through T-7) excavated to depths of 6½ to 10½± feet below the existing site grades. Results of the subsurface exploration concluded that ground surface materials within the E-Commerce, Commercial, and Open Space Planning Area consist of cement/concrete and subsurface materials within the Project site consist of artificial fill, alluvium, and older alluvium (refer to **Exhibit 4.6-1, Boring and Trench Location Plan**).[1]

[1] Southern California Technical. (2021). *Geotechnical Investigation; Page 6.* Accessed August 17, 2021. Refer to **Appendix E**.

Pavements: The ground surface materials identified on the Project site include Portland Cement Concrete (PCC). The pavement sections consist of approximately 2 inches of PCC.

Artificial Fill: Artificial fill soils were encountered at the ground surface of several boring locations and one trench location, extending to depths of 1½ to 29½± feet below ground surface. The fill soils generally consist of loose to medium dense silty fine sand and clayey fine to medium sand. Occasional layers of medium dense silty fine to coarse sand and soft to stiff fine sandy clays were encountered. Varying amounts of fine root fibers were encountered in the silty fine sand layers. The fill soil possesses a disturbed and mottled appearance, resulting in their classification as artificial fill. The deepest fill soils were encountered within Boring No. B-43, in the area of a former drainage channel. At this location, the artificial fill soils included rubber and concrete debris.

Alluvium: Native alluvium was encountered beneath the artificial fill soils or at the ground surface at all of the boring locations. The alluvial soils extend to depths of 1½ to 12± feet below ground surface in the northern areas of the site, and 25 to 50± feet below ground surface in the southern areas of the site. The alluvial soils generally consist of loose to very dense silty fine sands and silty fine to medium sands. These soils possess fine root fibers near the ground surface and occasional porosity. Occasional layers of medium dense silty fine sand to fine sandy silt, fine to coarse sand, clayey silt, fine sandy silt, and medium stiff silty clay were encountered in the deeper borings located in the southern areas.

Older Alluvium: Older alluvial deposits were encountered at the ground surface, or beneath the artificial fill and alluvium at all of the boring locations, extending to at least the maximum depth explored of 50± feet below ground surface. The older alluvial soils generally consist of medium dense to very dense silty fine sands, silty fine to medium sands, silty fine to coarse sands and silty fine sands to fine sandy silts. Several layers of medium dense to dense clayey fine sands, clayey fine to coarse sands and very stiff to hard fine sandy clays were encountered. Occasional layers of medium dense to dense fine sandy silts, fine to coarse sands and stiff fine to medium sandy clay were encountered.

Faulting and Seismicity

Regional and Local Faulting

The Project site is located within a seismically active region, and therefore subject to strong ground motions due to earthquakes. The primary source of regional seismic activity is movement along the northwest-trending regional fault systems such as the San Andreas, San Jacinto, and Elsinore fault zones. The Geotechnical Investigation determined that the Project site is not included within an Earthquake Fault Zone as identified by the Alquist-Priolo Earthquake Fault Zoning Act.

The Project site is not located within a County of Riverside Fault Hazard Zone. The nearest County of Riverside faults include the Cherry Valley Fault, located within a mile of the Project site to the east, and the Beaumont Plain Fault Zone, located approximately two miles further east of the Project site.[2]

[2] City of Beaumont. (2020) *Beaumont General Plan – Figure 9.5 Seismic Zones*. Available at City's website: https://www.elevatebeaumont.com/ (Accessed August 17, 2021).

Ground Shaking

Ground shaking is the result of rapid ground acceleration and can be expected during moderate to severe earthquakes. Ground shaking is common in the majority of the southern California earthquakes. Ground shaking can vary over an area and is primarily dependent on a result of factors such as topography, bedrock type, and the location and orientation of fault rupture.

Ground Subsidence

The term "ground subsidence" is defined as the sudden shrinking or gradual downward settling and compaction of the soil and other surface material with little or no horizontal movement. According to Figure 9.7, *Ground Subsidence Areas* of the Beaumont 2040 GP, the Project site is an area susceptible to ground subsidence.

Expansive Soils

Expansive soils are characterized as soils with significant amount of clay particles that can shrink or swell resulting in instability for overlying structures. The Geotechnical Investigation report analyzed the expansion potential of the on-site soils in accordance with American Society for Testing and Materials (ASTM) D-4829. Test results indicated that the on-site soils have a very low to low expansive potential or expansive index.

Secondary Seismic Hazards

Secondary seismic hazards generally associated with severe ground shaking during an earthquake include ground rupture, landslides, and liquefaction.

- **Ground Rupture:** Ground rupture is considered the most likely to occur along pre-existing active faults. As noted above, the Geotechnical investigation determined that the Project site is not located within an Earthquake Fault Zone as identified by the Alquist-Priolo Earthquake Fault Zoning Act or County of Riverside Fault. Thus, the potential for ground rupture is considered low.
- **Landslides.** A landslide is defined by the United States Geological Survey (USGS) as the movement of a mass of rock, debris, or earth down a slope. The Project site is relatively flat with an area of steep slope and a drainage course preserved in the Project's open space planning area. No evidence of previous land sliding or debris flow was observed during review of the California Geologic Survey (CGS) landslide inventory maps.[3] The risk of landslides impacting the Project site is considered low since the Project's topography does not contain steep topography, would the exception of the open space planning area which would be preserved.
- **Liquefaction:** Liquefaction is the loss of the strength in generally cohesionless, saturated soils when the pore-water pressure induced in the soil by a seismic event becomes equal to or exceeds the overburden pressure. The primary factors which influence the potential for liquefaction include groundwater table elevation, soil type and grain size characteristics, relative density of the soil, initial confining pressure, and intensity and duration of ground shaking. Figure 9.6,

[3] CGS. (2018). *California Geological Survey - Landslide Data Viewer*. Retrieved from California Department of Conservation (DOC) Website: https://maps.conservation.ca.gov/cgs/DataViewer/. (Accessed August 17, 2021)

Liquefaction Areas, of the Beaumont 2040 GP shows the Project site within an area of low liquefaction susceptibility. Furthermore, the Geotechnical Investigation conducted for the Project indicated that based on underlying soil conditions (which include moderate strength older alluvium), the proposed grading which includes fills of up to 65± feet, and the groundwater research performed for this site which indicates that the long-term groundwater table is considered to exist at a depth in excess of 50± feet. Thus, liquefaction is not considered to be a design concern for this Project.

Paleontological Setting

As noted above, the Project site is located within the Peninsular Ranges province. The Peninsular Ranges province consists of several northwesterly-trending ranges in the southwestern California. The on-site surface soils are comprised of cement/concrete. The subsurface soils consist of artificial fill, alluvium, and older alluvium. Geologic units within the City include Mesozoic, older granitic and metamorphic bedrock that have a very low paleontological resource potential due to the heat and pressure of their formation. As discussed in the City's Certified 2040 General Plan PEIR, very few paleontological sites have been documented in the City (Planning Area). The General Plan notes that the areas that will probably yield a greater potential of paleontological findings in the Planning Area are those that have been less disturbed by agricultural cultivation or other human disturbances. Overall, the City is known to contain areas with none, low, and high paleontological sensitivity. As shown in Figure 5.6-9, Paleontological Sensitivity, of the General Plan,[4] the Project site is not shown to be located in a high, low, or low to none-paleontological sensitivity potential.

4.6.3 Regulatory Setting

Federal

Occupational Safety and Health Administration Regulations

Excavation and trenching are among the most hazardous construction activities. OSHA's Excavation and Trenching standard, Title 29 of the Code of Federal Regulations (CFR), Part 1926.650, covers requirements for excavation and trenching operations. OSHA requires that all excavations in which employees could potentially be exposed to cave-ins be protected by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area.

Soil and Water Resources Conservation Act of 1977

The purpose of the Soil and Water Resources Conservation Act of 1977 is to protect or restore soil functions on a permanent sustainable basis. Protection and restoration activities include prevention of harmful soil changes, rehabilitation of the soil of contaminated sites and of water contaminated by such sites, and precautions against negative soil impacts. Disruptions of natural soil functions and its function as an archive of natural and cultural history should be avoided, as far as practicable. In addition, the Federal Water Pollution Control Act (also referred to as the Clean Water Act [CWA]) requirements,

[4] General Plan. 2021. Figure 5.6-9, *Paleontological Sensitivity*. Retrieved from https://files.ceganet.opr.ca.gov/151573-2/attachment/S-r_ENsisz7CVDo1U78pn-gddHM_rcMAeSj0g4Kvvj29jDm9Y3-mvvdfrpHQUpH9mpMLnjiSL50m_5ay0. (Accessed January 27, 2022).

through the National Pollution Discharge Elimination System (NPDES) permitting process, provide guidance for protection of geologic and soil resources.

Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act of 1977 (Public Law 95-124) established the National Earthquake Hazards Reduction Program (Program) which is coordinated through the Federal Emergency Management Agency (FEMA), the USGS, the National Science Foundation, and the National Institute of Standards and Technology. The purpose of the Program is to establish measures for earthquake hazards reduction and promote the adoption of earthquake hazards reduction measures by federal, state, and local governments; national standards and model code organizations; architects and engineers; building owners; and others with a role in planning and constructing buildings, structures, and lifelines through (1) grants, contracts, cooperative agreements, and technical assistance; (2) development of standards, guidelines, and voluntary consensus codes for earthquake hazards reduction for buildings, structures, and lifelines; and (3) development and maintenance of a repository of information, including technical data, on seismic risk and hazards reduction. The Program is intended to improve the understanding of earthquakes and their effects on communities, buildings, structures, and lifelines through interdisciplinary research that involves engineering, natural sciences, and social, economic, and decisions sciences.

U.S. Geological Survey Landslide Hazard Program

The USGS Landslide Hazard Program provides information on landslide hazards including information on current landslides, landslide reporting, real-time monitoring of landslide areas, mapping of landslides through the National Landslide Hazards Map, local landslide information, landslide education, and research.

Antiquities Act of 1906

The only federal law protecting fossil resources on public lands is the Antiquities Act of 1906 (16 United States Code [USC] 431–433). Enacted when Theodore Roosevelt was president, the Antiquities Act was designed to protect nonrenewable fossil and cultural resources from indiscriminate collecting. Specific paleontological sites can be protected under the National Registry of Natural Landmarks (16 USC 461-467), and at least three paleontological Landmarks are known in California. NEPA (42 USC 4321) directs Federal agencies to use all practicable means to "…preserve important historic, cultural, and natural aspects of our national heritage…" Section 106 of the National Historic Preservation Act does not apply to paleontological resources unless they are found in culturally related contexts.

Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act (PRPA) is part of the Omnibus Public Land Management Act of 2009 (Public Law 111-011, Subtitle D). This PRPA directs the Secretary of the Interior or the Secretary of Agriculture to manage and protect paleontological resources on federal land, and develop plans for inventorying, monitoring, and deriving the scientific and educational use of such resources. The PRPA prohibits the removal of paleontological resources from federal land without a permit issued under this Act, establishes penalties for violation of this Act, and establishes a program to increase public awareness about such resources. As of May 18, 2015, the U.S. Department of Agriculture has

implemented a new rule that "provides for the preservation, management, and protection of paleontological resources on National Forest System (NFS) lands and ensures that these resources are available for current and future generations to enjoy as part of America's national heritage. The rule addresses the management, collection, and curation of paleontological resources from NFS lands including management using scientific principles and expertise, collecting of resources with and without a permit, curation in an approved repository, maintaining confidentiality of specific locality data, and authorizing penalties for illegal collecting, sale, damaging, or otherwise altering or defacing paleontological resources."

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code [PRC] §§ 2621-2624, Division 2, Chapter 7.5) was passed in 1972 following the destructive February 9, 1971 moment magnitude (Mw) 6.6 San Fernando earthquake to mitigate the hazard of surface faulting to structures intended for human occupancy. The Act's main purpose is to prohibit siting buildings used for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting or fault creep. The Act requires the State Geologist to establish regulatory zones, known as "Earthquake Fault Zones," delineating appropriately wide earthquake fault zones to encompass potentially active and recently active traces of faults. Local agencies must regulate most development projects within these zones. Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed human occupancy structures would not be constructed across active faults. An evaluation and written report of a specific site must be prepared by a licensed geologist. 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 from the fault (typically at least 50-foot setbacks are required).

Effective June 1, 1998, the Natural Hazards Disclosure Act requires that sellers of real property and their agents provide prospective buyers with a "Natural Hazard Disclosure Statement" when the property being sold lies within one or more state-mapped hazard areas, including Earthquake Fault Zones.

Seismic Hazards Mapping Act of 1990

The SHMA of 1990 (California PRC, §§ 2690 et seq.) directs the California Department of Conservation's California Geological Survey to identify and map areas prone to liquefaction, earthquake-induced landslides, and amplified ground shaking. The purpose of the SHMA is to minimize loss of life and property through the identification, evaluation, and mitigation of seismic hazards.

The SHMA provides a statewide seismic hazard mapping and technical advisory program to assist cities and counties in fulfilling their responsibilities for protecting the public health and safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and other seismic hazards caused by earthquakes. Mapping and other information generated pursuant to the SHMA is to be made available to local governments for planning and development purposes. The state requires (1) local governments to incorporate site-specific geotechnical hazard investigations and associated hazard mitigation as part of the local construction permit approval process, and (2) the agent for a property seller,

or the seller if acting without an agent, to disclose to any prospective buyer if the property is located within a seismic hazard zone. The State Geologist is responsible for compiling seismic hazard zone maps. The SHMA specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

Natural Hazards Disclosure Act

Effective June 1, 1998, the Natural Hazards Disclosure Act requires that sellers of real property and their agents provide prospective buyers with a "Natural Hazard Disclosure Statement" when the property being sold lies within one or more State-mapped hazard areas. If a property is located in a Seismic Hazard Zone as shown on a map issued by the State Geologist, the seller or the seller's agent must disclose this fact to potential buyers.

California Building Code

Current law states that every local agency enforcing building regulations, such as cities and counties, must adopt the provisions of the California Building Code (CBC) within 180 days of its publication. The publication date of the CBC is established by the California Building Standards Commission, and the code is under Title 24, Part 2, of the California Code of Regulations (CCR). The CBC provides minimum standards to protect property and public safety by regulating the design and construction of excavations, foundations, building frames, retaining walls, and other building elements to mitigate the effects of seismic shaking and adverse soil conditions. The CBC contains provisions for earthquake safety based on factors including occupancy type, the types of soil and rock on-site, and the strength of ground shaking with a specified probability at a site. The 2019 CBC took effect on January 1, 2020. Requirements for Geotechnical Investigations Requirements for geotechnical investigations are included in CBC Appendix J, Grading, § J104; additional requirements for subdivisions requiring tentative and final maps and for other specified types of structures are in California Health and Safety Code (HSC) § 17953 to § 17955 and in CBC § 1802. Testing of samples from subsurface investigations is required, such as from borings or test pits. Studies must be done as needed to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on load-bearing capacity, compressibility, liquefaction, differential settlement, and expansiveness. CBC § J105 sets forth requirements for inspection and observation during and after grading.

Given the state's susceptibility to seismic events, the CBC's seismic standards are among the strictest in the world. The CBC applies to all development in the state, except where stricter standards have been adopted by local agencies. CBC Chapter 16 addresses structural design requirements governing seismically resistant construction (CBC § 1604), including (but not limited to) factors and coefficients used to establish seismic site class and seismic occupancy category for the soil/rock at the building location and the proposed building design (CBC §§ 1613.5 through 1613.7). CBC Chapter 18 includes (but is not limited to) the requirements for foundation and soil investigations (CBC § 1803); excavation, grading, and fill (CBC § 1804); allowable load-bearing values of soils (CBC § 1806); and the design of footings, foundations, and slope clearances (CBC § 1808 and 1809), retaining walls (CBC § 1807), and pier, pile, driven, and cast-

in-place foundation support systems (CBC § 1810). CBC Chapter 33 includes (but is not limited to) requirements for safeguards at worksites to ensure stable excavations and cut or fill slopes (CBC § 3304).

Construction activities are subject to occupational safety standards for excavation and trenching as specified in the California OSHA regulations (Title 8 of the CCR) and in Chapter 33 of the CBC. These regulations specify the measures to be used for excavation and trench work where workers could be exposed to unstable soil conditions. The Project would be required to employ these safety measures during excavation and trenching.

Uniform Building Code

The Uniform Building Code (UBC) is published by the International Conference of Building Officials. It forms the basis of approximately half the state building codes in the United States, including California's, and has been adopted by the state legislature together with additions, amendments, and repeals to address the specific building conditions and structural requirements in California.

The Building Earthquake Safety Act of 1986

This Act requires all local governments to identify all potentially hazardous buildings within their jurisdictions and to establish a program for mitigation of identified hazards. It is the legislative basis for the inventory of hazardous unreinforced masonry buildings and Unreinforced Masonry Ordinances adopted by most counties and cities in California.

The Recovery and Reconstruction Act of 1986

Under the Recovery and Reconstruction Act of 1986, local governments are authorized to prepare for expeditious and orderly recovery before a disaster, and to provide for reconstruction afterward. It enables localities to prepare pre-disaster plans and ordinances that may include: an evaluation of the vulnerability of specific areas to damage from a potential disaster; streamlined procedures for appropriate modification of existing General Plans or zoning ordinances affecting vulnerable areas; a contingency plan of action; organization for post-disaster conditions; short-term and long-term recovery and reconstruction; and a pre-disaster ordinance to provide adequate local authorization for post disaster activities.

State Earthquake Protection Law

The State Earthquake Protection Law (California Health and Safety Code [HSC] §§ 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the CBC. The CBC requires a site-specific geotechnical study to address seismic issues and identifies seismic factors that must be considered in structural design. Because the Project area is not located within an Alquist–Priolo Earthquake Fault Zone, special provisions would not be required for Project development related to fault rupture.

California Civil Code Section 1103-1103.4

California Civil Code § 1103-1103.4 applies to the transfers of real property between private parties, as defined therein, and requires notification upon transfer if the property is affected by one or more natural hazards. The following potential hazards must be disclosed, if known: FEMA flood hazard areas, dam failure inundation areas, very high fire hazard severity zone, wildland area with forest fire risks, earthquake fault zone, and seismic hazard zones including landslide and liquefaction on a standardized "Natural Hazard Disclosure Statement" (§ 1103.2).

Public Resources Code Section 5097 (Related to Paleontological Resources)

Several sections of the California PRC protect paleontological resources. Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any paleontological feature on public lands (lands under state, county, city, district or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands. The California Administrative Code §§ 4307- 4309, relating to the State Division of Beaches and Parks, afford protection to geologic features and "paleontological materials," but grant the director of the state park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are for state park purposes and in the interest of the state park system.

General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities

A Stormwater Pollution Prevention Plan (SWPPP) prepared in compliance with a National Pollutant Discharge Elimination System (NPDES) permit under the authority of the local Regional Water Quality Control Board (RWQCB) and State Water Resources Control Board (SWRCB) describes the Project area, erosion and sediment controls, runoff water quality monitoring, means of waste disposal, implementation of approved local plans, control of post construction sediment and erosion control measures and maintenance responsibilities, and non-stormwater management controls. Dischargers are also required to inspect construction sites before and after storms to identify stormwater discharge from construction activity, and to identify and implement controls where necessary.

Municipal Separate Storm Sewer System Permit

In 2010, the Santa Ana RWQCB issued a municipal separate storm sewer system (MS4) permit and waste discharge requirements (R8-2010-0033 and NPDES No. CAS 618033) to the Riverside County Permittees, which includes the City. Under this Permit, the City is required to enforce and comply with storm water discharge requirements pursuant to the Clean Water Act, the Porter-Cologne Water Quality Control Act, applicable state, and federal regulations (including policies of the SWRCB), the Santa Ana River Basin Water Quality Control Plan (Basin Plan), and the California Toxics Rule Implementation Plan.

The MS4 Permittees and Principal Permittee (Riverside County Flood Control & Water Conservation District) are required to develop several items that generally reduce pollutants in urban runoff to the maximum extent practicable (MEP). This includes "Local Implementation Plans" describing the enforceable elements of an agency's urban runoff compliance program, as well as a "Watershed Action

Plan" and "Hydromodification Management Plan" to address impacts from urbanization. Likewise, a "Drainage Area Management Plan" is periodically updated by the principal permittee to document MS4 permit compliance programs and to provide guidance to co-permittees for Local Implementation Plans. In addition, the "Consolidated Monitoring Program" defines the monitoring locations and methods to evaluate best management practices (BMP) effectiveness. Lastly, the MS4 permit requires a "Water Quality Management Plan" (WQMP) for most new development and certain redevelopment projects. Like the construction SWPPP, the WQMP identifies how site design elements, source control methods and treatment control BMPs in the post-construction phase would minimize pollutant loads to the municipal storm drain in the long-term.

Eligible projects submitted to the City are required to provide a project-specific WQMP prior to the first discretionary project approval or permit. Project applicants may submit a preliminary project-specific WQMP for discretionary project approval (land use permit); however, a final version would be submitted for review and approval prior to the issuance of any grading or building permits.

Regional

County of Riverside Ordinance No. 547 – Implementation of the Alquist-Priolo Earthquake Fault Zoning Act

County of Riverside Ordinance No. 547 establishes the policies and procedures used by the County to implement the Alquist-Priolo Act by requiring all projects proposed within an "earthquake fault zone" as shown on the maps prepared by the State Geologist to comply with the provisions of the Alquist-Priolo Act. It establishes regulations for construction, including for grading, slopes and compaction, erosion control, retaining wall design and earthquake fault zone setbacks.

Local

City of Beaumont 2040 General Plan

The following Beaumont 2040 GP goals, policies, and implementation actions concerning geology and soils include:

Conservation and Open Space Element

Goal 8.11: **A City where archaeological, cultural resources, tribal cultural resources, and historical places are identified, recognized, and preserved.**

Policy 8.11.1 Avoid or when avoidance is not feasible, minimize impacts to sites with significant archaeological, paleontological, cultural and tribal cultural resources, to the extent feasible.

Land Use and Design Element

Goal 3.12: **A City that minimizes the extent of urban development in the hillsides, and mitigates any significant adverse consequences associated with urbanization.**

Policy 3.12.2 Limit the extent and intensity of uses and development in areas of unstable terrain, steep terrain, scenic vistas, and other critical environmental areas.

Policy 3.12.3 Control the grading of land, pursuant to the City's Municipal Code, to minimize the potential for erosion, landslides, and other forms of land failure, as well as to limit the potential negative aesthetic impact of excessive modification of natural landforms.

Safety Element

Goal 9.6: **A City that protects human life, land, and property from the effects of wildland fire hazards.**

Policy 9.6.10 Evaluate soils and waterways for risks from flooding, water quality, and erosion to ensure that they are suitable to support redevelopment following a large fire.

Goal 9.7: **A City that protects safety of human life, land, and property from the effects of earthquakes and geotechnical hazards.**

Policy 9.7.1 As new versions of the California Building Code (CCR Title 24, published triennially) are released, adopt, and enforce the most recent codes that contain the most recent seismic requirements for structural design of new development and redevelopment to minimize damage from earthquakes and other geologic activity.

Policy 9.7.2 Require that all development projects within designated Alquist-Priolo Earthquake Fault Zones are accompanied by appropriate geotechnical analysis.

Policy 9.7.3 Coordinate with the National Earthquake Hazard Reduction Program of the FEMA to identify earthquake risks and available mitigation techniques.

Policy 9.7.4 Proactively seek compliance with the Alquist-Priolo Earthquake Fault Zoning Act by coordinating with the CGS and the USGS to establish and maintain maps establishing affected parcels within the City boundaries and the Sphere of Influence.

Policy 9.7.5 Ensure that Building and Safety agencies include thorough plan checks and inspections of structures vulnerable to seismic activity, fire risk, and flood hazards. Additionally, recommend the periodic observation of construction by design professionals.

Policy 9.7.6 Promote greater public awareness of existing state incentive programs for earthquake retrofit, such as Earthquake Brace and Bolt, to help property owners make their homes more earthquake safe.

Goal 9.8: **A City with reduced potential flood hazards.**

Policy 9.8.4 Require all new developments to mitigate potential flooding that may result from development, such as grading that prevents adverse drainage impacts to adjacent properties, on-site retention of runoff, and the adequate siting of structures located within flood plains.

Policy 9.8.4 Require all new developments to mitigate potential flooding that may result from development, such as grading that prevents adverse drainage impacts to adjacent properties, on-site retention of runoff, and the adequate siting of structures located within flood plains.

Implementation LUCD 25 Hillside Development Ordinance. Adopt and enforce compliance with the Hillside Development Ordinance. Review every 5 years for potential updates.

Implementation C19 Hillside Ordinance. Support and implement the existing hillside ordinance.

Implementation S9 Safety Information Campaign. Develop an information program to familiarize citizens with seismic risk and to develop seismic awareness. Develop an educational campaign for residents and business owners to learn what to do during an earthquake and how to better prepare for an earthquake.

Implementation S10 Community Preparedness Toolkit. Adopt a local Community Preparedness Toolkit that can be used to prepare for disasters, including fires, earthquakes, and extreme heat events.

Implementation S17 California Building Codes. Adopt the latest version of the California Building Code (CCR Title 24, published triennially) when released.

Implementation S18 Earthquake Hazard Reduction Ordinance. Update municipal code to require strengthening of existing wood-frame buildings with soft, weak, or open front wall lines in housing constructed before 1980.

Implementation S19 Code Enforcement. Continue the code enforcement program, including identification of pre-1933 structures of large scale or occupied by large numbers of people, and require correction or demolition of structures found to be dangerous.

Implementation S20 Seismic Retrofit Incentive Program. Develop a retrofit incentive program to help reduce earthquake hazards, focused on existing public facilities as well as existing multifamily housing constructed prior to 1980.

Implementation S21 Geologic Instability Mitigation. Update municipal code to adopt regulatory techniques to mitigate public safety hazards, and if necessary, prohibit development where geologic instability is identified.

City of Beaumont Municipal Code[5]

Title 13, Chapter 13.04 – Sewage Discharges

Chapter 13.04 of the Beaumont regulates ownership, connections, charges, design and use of sewers within the City.

Title 16 Subdivisions

Title 16 Subdivisions of the Beaumont MC requires compliance with Riverside County Ordinance No. 547, which states: "Within the earthquake fault zones shown on the maps prepared by the State Geologist pursuant to the Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code, Section 2621, et seq.), all applicants for a permit for a project shall comply with all of the provisions of the Act, the adopted Policies and Criteria of the State Mining and Geology Board and this ordinance."

[5] City of Beaumont. (2021). *City of Beaumont Municipal Code*. Retrieved at: https://library.municode.com/ca/beaumont/codes/code_of_ordinances (Assessed August 23, 2021).

Title 16 of the Beaumont MC also requires a written statement to accompany any tentative parcel map stating the type of sewage disposal that would be used. If on-site sewage disposal is proposed, the public works director shall require soil percolation tests or other pertinent information (p. 19). The regulation goes on to state that a package treatment plant and collector system shall be required in the event that an existing collection system is not available and if it is determined that satisfactory individual disposal systems cannot be proved because of soil conditions, determined by percolation tests in conformity with the standards of the "Ludwig Modification," and finding that the conditions and requirements of the health department and RWQCB cannot be met.

Building Codes

The City has adopted the CBC, Title 24, California Code of Regulations, Part 2, Volumes 1 and 2, including, Appendix C, Group U-"Agricultural Buildings," Appendix F "Rodent Proofing," Appendix I "Patio Covers," and Appendix J "Grading," (except as otherwise provided in the Beaumont MC) for regulating the erection, construction, enlargement, alteration, repair, moving, removal, demolition, conversion, occupancy, equipment, use, height, area and maintenance of all buildings or structures in the City. The Beaumont MC also states any and all amendments to such Building Code as may hereafter be adopted by the State of California shall be made a part of the Beaumont MC without further action by the City Council (Beaumont MC, Chapter 15.04.)

Chapters 18 of the CBC describe the "Soils and Foundations" requirements, particularly when geotechnical investigations and geohazard reports shall be conducted, and what is required to be included as part of their analyses. Notably, the CBC currently has just one exception for when a geotechnical investigation is not required: for one-story, wood-frame and light-steel-frame buildings of Type II or Type V construction and 4,000 square feet or less in floor area, not located within Earthquake Fault Zones or Seismic Hazard Zones (CBC 1803.2).

Plan Check Submittal

The Beaumont Public Works Department is responsible for construction, maintenance, and operation of public facilities and infrastructure within the City. The Department is also responsible for the review and approval of all engineering for land development projects and design, and construction of all capital improvement projects.

4.6.4 Impact Thresholds and Significance Criteria

State CEQA Guidelines Appendix G contains the Environmental Checklist Form, which includes questions concerning geology and soils. The questions presented in the Environmental Checklist Form have been utilized as significance criteria in this section. Accordingly, the Project would have a significant effect on the environment if it would:

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

- Strong seismic ground shaking.
- Seismic-related ground failure, including liquefaction.
- Landslides.

- Result in substantial soil erosion or the loss of topsoil;
- 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 landslide, lateral spreading, subsidence, liquefaction or collapse;
- 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;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Methodology and Assumptions

The Project is evaluated against the aforementioned significance criteria/thresholds, as the basis for determining the impact's level of significance concerning geological and soil resources. This analysis considers the existing regulatory framework (i.e., laws, ordinances, regulations, and standards) that avoid or reduce the potentially significant environmental impact. Where significant impacts remain despite compliance with the regulatory framework, feasible mitigation measures are recommended, to avoid or reduce the Project's potentially significant environmental impacts.

Approach to Analysis

This analysis of impacts on geological and soil resources examines the Project's temporary (i.e., construction) and permanent (i.e., operational) effects based on significance criteria/threshold's application outlined above. For each criterion, the analyses are generally divided into two main categories: (1) temporary impacts and (2) permanent impacts. Each criterion is discussed in the context of Project components that share similar characteristics/geography. The impact conclusions consider the potential for changes in environmental conditions, as well as compliance with the regulatory framework enacted to protect the environment.

The baseline conditions and impact analyses are based on the Geotechnical Investigation prepared by Southern California Geotechnical; review of Project maps and drawings; analysis of aerial and ground-level photographs; and review of various data available in public records, including local planning documents. The determination that a Project component would or would not result in "substantial" adverse effects on geological and soil resources considers the available policies and regulations established by local and regional agencies and the amount of deviation from these policies in the Project's components.

4.6.5 Impacts and Mitigation Measures

Impact 4.6-1 ***Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:***

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.

Level of Significance: Less than Significant Impact

Construction

The Geotechnical Investigation determined that none of the Project components are located on any known active earthquake faults as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map and on Figure 9.5, *Seismic Zones,* of the Beaumont 2040 GP. Regardless, the Project site is within a seismically active region and therefore, subject to seismic activity. As noted in Section 4.6.2 above, the nearest active faults are the Cherry Valley Fault, located within a mile of the Project site to the east, and the Beaumont Plain Fault Zone, located approximately two miles further east of the Project site. All Project components would be designed accordingly to the latest CBC seismic standards and in conformance with all applicable standards set in the Beaumont MC to resist structural collapse from strong seismic activity as stated in Title 15, Chapter 15.42 Earthquake Hazards Reduction, § 15.42.060 – General Requirements of the Beaumont MC. These standards include, but are not limited to the following:

Responsibility of Owner.

The owner of each building within the scope of this Chapter shall cause a structural analysis of the building to be made by civil or structural engineer licensed by the State of California. If the building does not meet the minimum earthquake standards specified in this Chapter, the owner shall either cause it to be structurally altered to conform to such standards; or shall initiate proceedings for demolition of the building. Within 270 days after the service of the order specified in § 15.42.050, the owner shall comply with the requirements set forth in this Subsection by submitting to the Building Official one of the following:

1. A structural analysis which shall demonstrate that the building meets the minimum requirements of this Chapter; or
2. A structural analysis and plans for proposed structural alterations necessary to make the building comply with the minimum requirements of this Chapter; or
3. An application for the demolition of the building. After plans are submitted and approved by the Building Official, the owner shall obtain a building permit, commence and complete the required construction or demolition within the time limits set forth in Table No. 15.42-A.

With compliance with the latest CBC and the Beaumont MC, a less than significant impact would occur.

Operations

The Project is not located within an Alquist-Priolo Fault zone. Furthermore, the Project's operational activity would adhere to all applicable City regulations and engineering standards and specifications. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation measures are necessary.

Level of Significance

Less than significant impact.

Impact 4.6-2 ***Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:***

Strong seismic ground shaking?

Level of Significance: Less than Significant Impact

Construction

Intensity of ground shaking at a given location depends primarily upon earthquake magnitude, site distance from the source, and site response (soil type) characteristics. The site-specific seismic coefficients based on the 2019 CBC are provided in **Table 4.6-1, 2019 CBC Site-Specific Seismic Coefficients**, below.

Table 4.6-1: 2019 CBC Seismic Design Parameters

Parameter		Value
Mapped Spectral Acceleration at 0.2 sec Period	Ss	2.091
Mapped Spectral Acceleration at 1.0 sec Period	S_1	0.718
Site Class	---	D
Site Modified Spectral Acceleration at 0.2 sec Period	S_{MS}	2.509
Site Modified Spectral Acceleration at 1.0 sec Period	S_{M1}	1.221
Design Spectral Acceleration at 0.2 sec Period	S_{DS}	1.673
Design Spectral Acceleration at 1.0 sec Period	S_{D1}	0.814
Source: Southern California Geotechnical. (2021) *Geotechnical Investigation.* Accessed August 19, 2021 (EIR Appendix E).		

The potential for damage resulting from seismic-related events include ground shaking, ground failure, and ground displacement. Strong levels of seismic ground shaking can cause damage, particularly to older and/or poorly constructed buildings. As noted above, the Project is subject to regional seismicity. Therefore, all Project components would be designed in accordance with the requirements of the 2019 edition of the CBC and in compliance with all the provisions of the Alquist-Priolo Act and the adopted policies and criteria of Ordinance No. 547. In addition, all relevant documents would be submitted to the Beaumont Public Works Department as part of the Project's discretionary review process. Furthermore, adherence with goal 9.7 and policies 9.7.1 through 9.7.5 of Beaumont 2040 GP would ensure that adverse impacts from strong seismic ground shaking is reduced through the adequate planning and building of structures in seismic prone areas through the implementation of the previously noted policies which seek to enforce the most recent seismic requirements, require that all developments located within Alquist-Priolo zones are accompanied with appropriate geotechnical analysis, properly coordinate with FEMA to

identify earthquake risks and or mitigation techniques, and ensuring that Building and Safety agencies are involved throughout the plan checks and inspections of the Project. Therefore, impacts concerning strong seismic ground shaking would be less than significant.

Operations

There is a possibility for the Project's e-commerce and commercial buildings to experience strong ground shaking during operations. However, the buildings would be designed in accordance with all applicable design measures which would ensure that operation impacts related to strong seismic ground shaking.

Mitigation Measures

No mitigation measure is necessary.

Level of Significance

Less than significant impact.

Impact 4.6-3 ***Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:***

Seismic-related ground failure, including liquefaction?

Level of Significance: Less than Significant Impact

Construction

As discussed in Section 4.6.2 above, liquefaction is the loss of the strength in generally cohesionless, saturated soils when the pore-water pressure induced in the soil by a seismic event becomes equal to or exceeds the overburden pressure. The depth within which the occurrence of liquefaction may impact surface improvements is generally identified as the upper 50 feet below the existing ground surface. Isolated portions of the western and southern-most regions of the site are located within a zone of moderate liquefaction susceptibility. However, the Geotechnical Investigation determined that based on underlying soil conditions (which included moderate strength older alluvium), the groundwater table was considered to exist beyond 50 feet. Therefore, liquefaction is not considered to be a design concern for this Project and ground-moving activities (i.e., excavation, grading, etc.) would not contribute to the susceptibility of the site. Overall impacts associated with seismic-related ground failure, including liquefaction would be less than significant.

Operations

All Project components would be subject to seismic-relating ground shaking, but not to the extent that persons and structures would be significantly impacted by ground-failure associated with liquefaction since all Project buildings would be designed accordingly with applicable state and local design standards. Impacts would be less than significant with no mitigation measures necessary.

Mitigation Measures

No mitigation measure is necessary.

Level of Significance

Less than significant impact.

Impact 4.6-4 ***Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:***

Landslides?

Level of Significance: No Impact

Construction

Seismically induced landslides and other slope failures are common occurrences during or soon after earthquakes. The susceptibility of a geologic unit to landslides is dependent upon various factors, primarily: 1) the presence and orientation of weak structures, such as fractures, faults, and joints; 2) the height and steepness of the pertinent natural or cut slope; 3) the presence and quantity of groundwater; and 4) the occurrence of strong seismic shaking. The City contains various steepness of slopes ranging from 0 to 5 degrees to 41 to 70 degrees; thus, some areas could be susceptible to seismically induced landslides. As noted in Section 4.6.2 above, no evidence of previous land sliding or debris flow was observed during review of the CGS landslide inventory maps.[6] Additionally, the risk of landslides impacting the Project site is considered low to negligible since the Project's topography does not contain steep slopes.[7] Furthermore, the Project is not surrounded by steep topography with exposed rock-cropping or boulders.

Compliance with the standards in the current CBC would require an assessment of hazards related to and the incorporation of design measures into structures to mitigate this hazard if development were considered feasible. The Beaumont MC requires provisions to grading and development on or near hillsides. The City has included goals, policies, and implementation in the General Plan to minimize the risk of injury, loss of life, and property damage caused by earthquake hazards or geologic disturbances. Thus, compliance with CBC regulations and General Plan Goal 3.12 and Policy 3.12.3 which seeks to control the grading of land, pursuant to the Beaumont MC, to minimize potential for erosion, landslides, and other forms of land failure. Implementation actions will reduce impacts related to landslides are less than significant and no mitigation is necessary. Therefore, impacts associated with landslides would be less than significant.

Operations

Since ground-moving activities would cease at the end the construction phase, and the Project site is not located adjacently to steep topography, no impacts associated with landslides would occur during Project operations.

Mitigation Measures

No mitigation measure is necessary.

[6] CGS. (2018). *California Geological Survey - Landslide Data Viewer*. Retrieved from California Department of Conservation (DOC) Website: https://maps.conservation.ca.gov/cgs/DataViewer/. (Accessed August 17, 2021)

[7] General Plan. 2021. *Figure 5.6-5, Steep Slopes*.

Level of Significance

No impact.

Impact 4.6-5 Would the Project result in substantial soil erosion or the loss of topsoil?

Level of Significance: Less than Significant Impact with Mitigation Incorporated

Construction

Construction activities such as grading, site stripping, excavation, and demolition would potentially result in soil erosion and the loss of topsoil. The grading proposed by the Project would cut/remove approximately 2,230,40 cubic yards (CY) of all the existing undocumented fill soils and most of the near-surface compressible/collapsible younger alluvial soils and replace these materials as compacted fill soils and approximately 1,869,300 CY would be used to fill the site. The difference of approximately 360,840 CY of cut soil material will be compacted on-site. The underlying moderate strength older alluvium which would remain in-place are not expected to be susceptible to settlement from the foundations of the proposed structures. Grading would also include cut/fills of up to 65 feet within the building pads. Grading activities would include newly constructed fill slopes (both cut and fill), comprised of properly compacted engineered fill. Initial site stripping would include the removal of any surficial vegetation and topsoil. This would also include any weeds, grasses, shrubs, and trees. The Project would also include the demolition of minor existing improvements such as buildings, retaining walls, concrete slabs and foundations which would subject both top and subsurface soils to erosion. Therefore, the Project would adhere to the construction design features and Mitigation Measure (MM) GEO-1, which requires that a settlement monitoring program be implemented.

Construction activities would also be required to comply with the NPDES General Construction Permit and be subject to Best Management Practices (BMPs) set in the Project-specific Stormwater Pollution Prevention Plan (SWPPP) and water quality management plan (WQMP) to reduce impacts from runoff associated with soil erosion (refer to **Section 4.9, Hydrology and Water Quality**, of this EIR). Construction activities would also be required to comply with the erosion control measures stipulated through the CBC, and other applicable ordinances; federal, state, and local permits; and other applicable requirements. Therefore, implementation of **MM GEO-1** and permitting requirements and erosion control measures would ensure that impacts related to soil erosion are mitigated to less than significant levels.

Operations

The Project's operational activity is not anticipated to damage or result in the loss of topsoil/sedimentation into local drainage facilities and water bodies. Operation activities (i.e., landscape maintenance) would be subject to the BMPs set in the Project's SWPPP and WQMP that would prevent soil erosion or loss of topsoil (refer to **Section 4.9, Hydrology and Water Quality**, of this EIR). A network of storm drains and gutters would be maintained and upgraded as necessary and provided throughout the developed site as needed. Therefore, a less than significant impact would occur with operation of the Project.

Mitigation Measures

MM GEO-1 **Settlement Monitoring Program.** A Settlement Monitoring Program would be implemented, consisting of the surveying of surface monuments to monitor settlement of alluvial soils left in-place and/or proposed fills deeper than 30 feet (design plus remedial grading). Survey monument readings for both deep fill areas and for fill over compressible natural ground (Qal) should be conducted following the completion of fill placement. Survey monument locations should be selected by the geotechnical consultant. Survey readings should be taken weekly for the first month and on a weekly basis thereafter until vertical movement of the fill mass achieve 90 percent of primary compression, begin secondary compression or the estimated remaining settlement is less than one inch. Construction of proposed structures would not commence until approved by the geotechnical consultant based on the results of the settlement monitoring. Survey benchmarks used for the monitoring would be confirmed with the geotechnical consultant prior to initial readings being performed.

Foundation and Grading Plan Review. New retaining walls with maximum heights of up to 50± feet would be constructed as part of the new development. Additional review of the global stability of the proposed site grading be performed by SCG once more detailed rough grading plans become available. An additional subsurface exploration may be required to evaluate the geotechnical design considerations of the retaining wall and new slope configurations.

Over excavation. Benching of the sidewalls would be required during fill placement. The horizontal extent of the benching should be sufficient to reduce the inclination of the native fill contact to 3h:1v or flatter. Following completion of the over excavations, the subgrade would be evaluated by the geotechnical engineer to verify its suitability to serve as the structural fill subgrade. Some localized areas of deeper excavation may be required if loose, porous, or low-density materials are encountered at the base of the over excavation. Materials suitable to serve as the structural fill subgrade within the building area should consist of moderate strength alluvial soils which possess an in-situ density equal to at least 85 percent of the ASTM D-1557 maximum dry density. These materials would be moisture conditioned to 0 to 4 percent above optimum moisture content prior to placement of any new fill soils. The previously excavated soils may then be replaced as compacted structural fill.

Level of Significance

Less than significant with mitigation incorporated.

Impact 4.6-6 ***Would the Project 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 landslide, lateral spreading, subsidence, liquefaction or collapse?***

Level of Significance: Less than Significant Impact with Mitigation Incorporated

Construction

The Project site is not included within an Earthquake Fault Zone as identified by the Alquist-Priolo Earthquake Fault Zoning Act. However, the Project site is in a seismically active area and located near an active fault zone. The Project would be designed in accordance with applicable state and local design standards to withstand effects from strong seismic ground-shaking and would implement geotechnical design considerations pursuant to the Geotechnical Investigation including **MM GEO-1** to ensure that the Project is not subject to collapse.

The Project is an area of low to moderate liquefaction susceptibility, but the groundwater table has been shown to exist beyond 50 feet and therefore not a concern for this Project.

Subsequent to grading, the proposed development areas would be underlain by engineered fill soils (design plus remedial), extending to depths of 50 to 85+ feet. The primary settlement associated with these fill soils is expected to occur relatively quickly due to the generally granular nature of the on-site soils. Minor amounts of additional settlement may occur due to secondary consolidation effects. The extent of secondary consolidation is difficult to assess precisely and would be reduced by **MM GEO-1** but may be in the range of 0.1 to 0.3 percent of the fill thickness. Based on the differential fill thickness that would exist across the building footprints, the structural design would account for distortions that could be caused by the secondary consolidation of the fill soils. Provided that the grading and foundation design recommendations presented in the Geotechnical Investigation are implemented, the settlements are expected to be within the structural tolerances of the proposed buildings.

The Project grading plan indicates that the new slopes (both cut and fill) would occur at inclinations of 2h:1v or flatter. Newly constructed fill slopes, comprised of properly compacted engineered fill, at inclinations of 2h:1v would possess adequate gross and surficial stability. Cut slopes excavated within the existing granular alluvial soils may be subject to surficial instability due to the lack of cohesion within these materials. Therefore, stability fills would be implemented within these areas.

Furthermore, Project construction would be temporary and therefore would not be susceptible to on- or off-site landslide, lateral spreading, subsidence.

Overall, impacts would be less than significant with implementation of design features and geotechnical design parameters, and implementation of **MM GEO-1**.

Operations

Project designs would be subject to compliance with applicable state and local design standards. Implementation of the Project design features discussed, and implementation of **MM GEO-1** would ensure that operation of the Project would not result in substantial adverse effects involving strong seismic ground shaking, seismic-related ground failure (liquefaction/lateral spreading), and seismically-induced landslides.

Mitigation Measures

Refer to **MM GEO-1** above.

Level of Significance

Less than significant impact with mitigation incorporated.

Impact 4.6-7: ***Would the Project 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?***

Level of Significance: Less than Significant Impact with Mitigation Incorporated

Construction

The near-surface soils consist of silty sands and sandy silts with no appreciable clay content. However, some isolated strata of sandy clays and clayey sands were encountered. On-site grading is expected to blend the on-site soils, resulting in a very low to low expansion index (Expansion Index > 50 per ASTM D-4829). Additional expansion index testing would also be performed at the time of rough grading in order to confirm the expansion potential of the near-surface soils.

Although the expansive soil potential was considered to be low, the Project would implement various project design measures/controls to reduce the exposure of people and structures to the effects of expansive soils by complying with requirements set forth in the latest CBC. Project construction associated with expansive soils would result in a less than significant impact.

Operations

The Project would be subject to compliance with requirements set forth in the CBC that is current at the time of construction and implement settlement considerations, foundation design and earthwork considerations related to soil removal and compaction via **MM GEO-1**. Project operations would result in a less than significant impact related to risks to life or property associated with expansive soils.

Mitigation Measures

Refer to **MM GEO-1** above.

Level of Significance

Less than significant with mitigation incorporated.

Impact 4.6-8: ***Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?***

Level of Significance: No Impact

Construction and Operations

The Project does not propose the use of septic tanks or an alternative wastewater disposal system. The Project would utilize the existing sanitary sewer system in the area. Specifically, sewer service is provided by the City-owned Beaumont Wastewater Treatment Plant No. 1 (WWTP). Existing 15-inch sewer lines are located in a subdivision to the south of Brookside Avenue, flowing under Interstate 10. The Project's

proposed sewer infrastructure would be a gravity system placed in drive aisles and the central entry road and connecting with a proposed sewer line in Brookside Avenue. Impacts would not occur.

Mitigation Measures

No mitigation measures are required.

Level of Significance

No impact.

Impact 4.6-9: Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Level of Significance: Less than Significant Impact with Mitigation Incorporated

Construction

As noted above, the Peninsular Ranges province consists of several northwesterly-trending ranges in the southwestern California. The surface and subsurface soils are comprised of cement/concrete, artificial fill, alluvium, and older alluvium. Older granitic and metamorphic bedrock that have a very low paleontological resource potential due to the heat and pressure of their formation. Due to the presence of older alluvium soils throughout the Project site, there is a high possibility of paleontological resources that may be disturbed during construction. Therefore, with implementation of **MM GEO-2** (Paleontological Construction Monitoring and Compliance Program), construction of the Project components would not destroy a unique paleontological resource or site or unique geologic feature, thereby reducing impacts to a less than significant level.

Operations

Project implementation and operation would not involve any activities that impact paleontological resources. Therefore, Project operations would not destroy a unique paleontological resource or unique geologic feature.

Mitigation Measures

MM GEO-2 **Paleontological Construction Monitoring and Compliance Program.** The following measures would be implemented to reduce potential impacts to paleontological resources to less than significant:

Retain a Qualified Paleontologist. Prior to initial ground disturbance, the Applicant shall retain a Project paleontologist, defined as a paleontologist who meets the Society of Vertebrate Paleontology standards for Qualified Professional Paleontologist, to direct all mitigation measures related to paleontological resources.

Paleontological Monitoring. Ground disturbing construction activities (including grading, trenching, foundation work, and other excavations) in areas mapped as high paleontological sensitivity shall be monitored on a full-time basis by a qualified paleontological monitor during initial ground disturbance. Areas mapped as low to

high paleontological sensitivity shall be monitored when ground-disturbing activities exceed five feet in depth, because underlying sensitive sediments could be impacted. Areas considered to have an undetermined paleontological sensitivity shall be inspected and further assessed if construction activities bring potentially sensitive geologic deposits to the surface. The Paleontological Mitigation and Monitoring Program shall be supervised by the Project paleontologist. Monitoring must be conducted by a qualified paleontological monitor, who is defined as an individual who has experience with collection and salvage of paleontological resources. The duration and timing of the monitoring would be determined by City based on recommendation from the Project paleontologist. If the Project paleontologist determines that full-time monitoring is no longer warranted, they may recommend to the City that monitoring be reduced to periodic spot-checking or cease entirely. Monitoring would be reinstated if any new or unforeseen deeper ground disturbances are required and reduction or suspension would need to be reconsidered by the Supervising Paleontologist. Ground disturbing activity that does not exceed five feet in depth would not require paleontological monitoring.

Paleontological Mitigation and Monitoring Program. After Project design has been finalized to determine the precise extent and location of planned ground disturbances, and prior to construction activity, a qualified paleontologist would prepare a Paleontological Mitigation and Monitoring Program to be implemented during ground disturbance activity for the Project. This program would outline the procedures for construction staff Worker Environmental Awareness Program (WEAP) training, paleontological monitoring extent and duration, salvage and preparation of fossils, the final mitigation and monitoring report, and paleontological staff qualifications. The program would be prepared in accordance with the standards set forth by current Society of Vertebrate Paleontology guidelines (2010) and with proper implementation, would reduce or eliminate potential impacts to paleontological resources.

Paleontological Worker Environmental Awareness Program. Prior to the start of construction, the Project paleontologist or his/her designee shall conduct training for construction personnel regarding the appearance of fossils and the procedures for notifying paleontological staff should fossils be discovered by construction staff. The WEAP shall be presented at a preconstruction meeting that a qualified paleontologist shall attend. In the event of a fossil discovery by construction personnel, all work in the immediate vicinity of the find shall cease and a qualified paleontologist shall be contacted to evaluate the find before restarting work in the area. If it is determined that the fossil(s) is (are) scientifically significant, the qualified paleontologist shall complete the following conditions to mitigate impacts to significant fossil resources.

Salvage of Fossils. If fossils are discovered, the Project paleontologist or paleontological monitor should recover them. Typically, fossils can be safely salvaged quickly by a single paleontologist and not disrupt construction activity. In some cases,

larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case, the paleontologist would have the authority to temporarily direct, divert, or halt construction activity to ensure that the fossil(s) can be removed in a safe and timely manner.

Preparation and Curation of Recovered Fossils. Once salvaged, the City would ensure that significant fossils would be identified to the lowest possible taxonomic level, prepared to a curation-ready condition, and curated in a scientific institution with a permanent paleontological collection (such as the Western Science Center), along with all pertinent field notes, photos, data, and maps. Fossils of undetermined significance at the time of collection may also warrant curation at the discretion of the Project paleontologist. Field collection and preparation of fossil specimens would be performed by the Project paleontologist with further preparation as needed by an accredited museum repository institution at the time of curation.

Final Paleontological Mitigation Report. Upon completion of ground-disturbing activity (and curation of fossils, if necessary) the qualified paleontologist should prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report should include discussion of the location, duration, and methods of the monitoring, stratigraphic sections, any recovered fossils, and the scientific significance of those fossils, and where fossils were curated.

Level of Significance

Less than significant with mitigation incorporated.

4.6.6 Cumulative Impacts

Southern California is a seismically active region with a range of geologic and soil conditions. These conditions can vary widely within a limited geographical area due to factors, including differences in landforms and proximity to fault zones, among others. Therefore, while geotechnical impacts may be associated with the cumulative development, by the very nature of the impacts (i.e., landslides and expansive and compressible soils), impacts are typically site-specific and there is little, if any, cumulative relationship between the development of Project and development within a larger cumulative area, such as citywide development.

Impacts associated with seismic events and hazards would be considered significant if the effects of an earthquake on a property could not be mitigated by an engineered solution. The significance criteria do not require elimination of the potential for structural damage from seismic hazards. Instead, the criteria require an evaluation of whether the seismic conditions on a site can be overcome through engineering design solutions that would reduce to less than significant the substantial risk of exposing people or structures to loss, injury, or death. As stated throughout this section, the Project's compliance with applicable state and local design standards and regulations including implementation of **MM GEO-1** and **MM GEO-2** would ensure that impacts related to geology and soils are reduced to less than significant levels. Consequently, the Project's incremental contribution to cumulative geotechnical and seismic impacts would be less than significant. None of the Project characteristics would affect or influence the

geotechnical hazards for off-site development and any cumulative development would be required to comply with the same applicable state and local design standards, regulations, goals, and policies. For these reasons, no significant cumulative geotechnical impacts would occur for the Project.

4.6.7 Significant Unavoidable Impacts

No significant and unavoidable impact concerning geology and soils has been identified.

4.6.8 References

City of Beaumont. (2020) Beaumont General Plan – Figure 9.5 Seismic Zones. Available at City's website: https://www.elevatebeaumont.com/ (Accessed August 17, 2021).

City of Beaumont. (2021). City of Beaumont Municipal Code. Retrieved at: https://library.municode.com/ca/beaumont/codes/code_of_ordinances (Assessed August 23, 2021).

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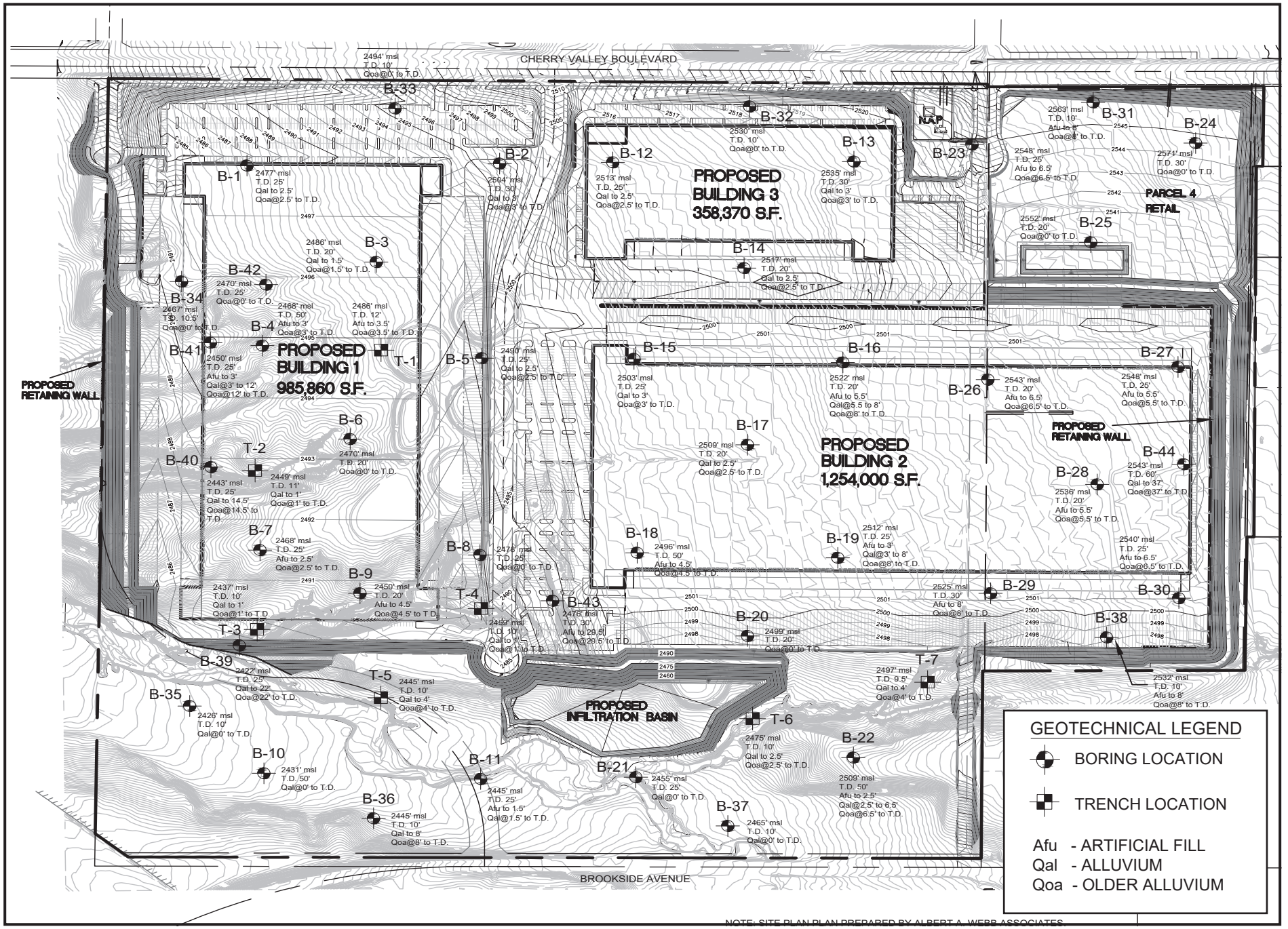

Exhibit 4.6-1: Boring and Trench Location Plan

Beaumont Summit Station Specific Plan EIR

City of Beaumont

Not to scale

Kimley»Horn

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