DRAFT

300 PIEDMONT AVENUE PROJECT

DRAFT ENVIRONMENTAL IMPACT REPORT

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Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
2017 Clean Air Plan	2017 Clean Air Plan: Spare the Air, Cool the Climate
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACM	asbestos-containing materials
ADA	Americans with Disabilities Act
ADT	average daily trips
ADUs	accessory dwelling units
AFP	Affordable Housing Program
AIA	Airport Influence Area
ALUCP	Airport Land Use Compatibility Plan
ASES	After School Education & Safety
ATCMs	airborne toxic control measures
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
BAWSCA	Bay Area Water Supply & Conservation Agency
Bay Area	San Francisco Bay Area
BERD	Built Environment Resource Directory
bgs	below ground surface
BMPs	best management practices
BMR	below market rate
BWF	base wastewater flow
C.F.R.	Code of Federal Registrations
C/CAG	City/County Association of Governments
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAD	Computer Aided Design
CAFÉ	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection's
Cal/OSHA	California Occupational Safety and Health Administration
CalEnviroScreen	California Communities Environmental Health Screening Tool
CALGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CAPP	Community Air Protection Program
CARB	California Air Resources Board
CBC	California Building Code
CCE	community choice energy
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA Air Quality Guidelines	BAAQMD California Environmental Quality Act, Air Quality Guidelines
CEQA	California Environmental Quality Act

CGS	California Geological Survey
CH_4	methane
City	City of San Bruno
CMP	Congestion Management Program
CNEL	Community Noise Equivalent Level
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Construction General Permit	Construction General NPDES General Permit for Construction Activities
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel
DEM	Department of Emergency Management
District	San Mateo Union High School District
DOF	California Department of Finance
DPM	diesel particulate matter
DPR	Department of Parks and Recreation
DTSC	Department of Toxic Substances Control
DUs	dwelling units
DWR	State of California Department of Water Resources
EIA	U.S. Energy Information Administration
EIR	environmental impact report
EO	executive orders
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986
ESA	Environmental Site Assessment
ESLs	environmental screening levels
EV	electric vehicle
FAA	Federal Aviation Administration
fc	foot-candle
FEMA	Federal Emergency Management Agency's
FERC	Federal Energy Regulatory Commission
FHSZ	fire hazard severity zone
FHSZs	High Fire Hazard Severity Zones
FHWA	Federal Highway Administration
GAMA	Groundwater Ambient Monitoring and Assessment Program
GHG	greenhouse gas
GIS	Geographic information system
gpd	gallons per day
gpm	gallons per minute
GPS	Global Positioning System
GSR	Groundwater Storage and Recovery
GVWR	gross vehicle weight rating

GWP	global warming potential
HCD	Housing and Community Development
HFCs	hydrofluorocarbons
HMPs	Hydromodification Management Plans
HOA	Homeowners Association
HOV	high-occupancy vehicle
HRA	Health Risk Assessment
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
I-	Interstate
I-280	Interstate 280
IESNA	Illuminating Engineering Society of North America
IPCC	Intergovernmental Panel on Climate Change
IS/MND	Initial Study/Mitigated Negative Declaration
ISG	Individual Supply Guarantee
IWMA	Integrated Waste Management Act
JPA	Joint Powers Authority
KOPs	key observation points
kV	kilovolt
kWh	kilowatt hours
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
LID	low-impact development
L_{max}	maximum sound level
L_{min}	minimum sound level
LOS	level of service
LRA	local responsibility area
LTS	Less than Significant
LTSM	Less than Significant with Mitigation
LUSTs	leaking underground storage tanks
L_{xx}	percentile-exceeded sound level
Ma	million years ago
mgd	million gallons per day
mg/m^3	milligrams per cubic meter
MMRP	Mitigation Monitoring and Reporting Program
mpg	miles per gallon
mph	miles per hour
MPO	Metropolitan Planning Organization
MRP	Municipal Regional Stormwater Permit
MS4 Permit	NPDES General Permit for Municipal Separate Storm Sewer Systems
MS4	Municipal Separate Storm Sewer Systems
MTC	Metropolitan Transportation Commission
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission

NCCWD	North Coast County Water District
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHTSA	National Highway Traffic Safety Administration
NI	No Impact
NO_2	nitrogen dioxide
NOI	notice of intent
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O_3	ozone
OEHHA	Office of Environmental Health Hazard Assessment
OHSA	Occupational Safety and Health Administration
OPR	Governor's Office of Planning and Research
PCE	Peninsula Clean Energy
PDAs	Priority Development Areas
PFCs	perfluorocarbons
PG&E	Pacific Gas and Electric Company
PM	particulate matter
$PM_{2.5}$	particles less than 2.5 microns in diameter
PM_{10}	particles less than 10 microns in diameter
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
Porter-Cologne	Porter-Cologne Water Quality Act
ppm	parts per million
PPV	peak particle velocity
PRC	California Public Resources Code
PRV	pressure reducing value
psi	pounds per square inch
PWWF	peak wet weather flow
REC	Recognized Environmental Condition
Regional Water Boards	Regional Water Quality Control Boards
RHNA	Regional Housing Needs Allocation
ROG	reactive organic gases
RPS	Renewable Portfolio Standard
RTP	Regional Transportation Plan
RWS	Regional Water System
SAFE	Safer Affordable Fuel-Efficient
Sam Trans	San Mateo County Transit District
SARA	Superfund Amendments and Reauthorization Act of 1986
SB	Senate Bill
SBPSD	San Bruno Park School District
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin

SFO	San Francisco International Airport
SFPUC	San Francisco Public Utility Commission
SIP	State Implementation Plan
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SMUHSD	San Mateo Union High School District
SO_2	sulfur dioxide
SORE	standards for small off-road engines
SPCC	Spill Prevention, Control, and Countermeasure
SR	State Route
SRAs	State Responsibility Areas
SSF/SB WQCP	South San Francisco-San Bruno Water Quality Control Plant
State Water Board	State Water Resources Control Board
SU	Significant and Unavoidable
SWPPP	stormwater pollution prevention plan
TAC	toxic air contaminant
TDM	Transportation Demand Management
USGS	United States Geological Survey
UST	underground storage tank
UV	ultraviolet
UWMP	Urban Water Management Plan
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WSA	Water Supply Assessment
WSIP	Water System Improvement Program
WUI	wildland urban interface
ZEV	zero-emission vehicles

Executive Summary

This Draft Environmental Impact Report (EIR) has been prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts of the proposed 300 Piedmont Avenue Project (project) and project variant. This Draft EIR has been prepared in accordance with the provisions of CEQA and the State CEQA Guidelines (Title 14 California Code of Regulations Section 15000 et seq.).

As required by Section 15123 of the State CEQA Guidelines, this summary presents the following information, including the major findings of this Draft EIR.

- Project overview, including the location, a brief description, and objectives.
- Areas of known controversy and issues to be resolved.
- Summary of environmental impacts and mitigation measures, including significant and unavoidable impacts.
- Alternatives, including alternatives considered but rejected, alternatives evaluated in this Draft EIR, and identification of the environmentally superior alternative.

ES.1 Project Overview

The project site is located on a 40.2-acre parcel at 300 Piedmont Avenue in the City of San Bruno (City). Piedmont Avenue becomes Courtland Drive (a private driveway with a public access easement) at the southern entrance to the project site and runs north–south along and close to the eastern edge of the site. Interstate 280 (I-280) runs southeast of Courtland Drive, with the San Bruno Chinese Church located between Courtland Drive and I-280 near the northern entrance to the project site and a vegetated area otherwise separating the two roadways. Vehicular access is provided to the project site from Piedmont Avenue at the southern entrance and Courtland Drive at the northern entrance.

The project site currently contains the former Crestmoor High School, as well as playing fields, parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. Crestmoor High School closed in 1980, and Peninsula Alternative High School occupied a portion of the buildings until it vacated its portion of the project site in 2021. In the interim, the site was used for operations such as the San Mateo County Superior Court (early 1990s) and a preschool (2000s –2020) and a church (2011–2017) (ESA 2022). It has therefore been maintained over the years, though there has been some natural degradation. The high school campus is currently vacant. The sloped areas on the west side of the campus have been minimally maintained and are densely wooded, dominated by Monterey pine (*Pinus radiata*) and red gum eucalyptus (*Eucalyptus camaldulensis*) trees with a dense shrub layer. Existing single-family subdivisions neighbor the project site to the north, west, and south across substantial grade changes, with a wooded hillside buffer. Within the existing developed area, the project site rises approximately 44 feet from north to south.

The project would involve demolishing the existing structures on the site and establishing a new 155-lot, single-family, detached-home community with associated open space and infrastructure. One neighborhood would include 63 four-bedroom homes ranging from approximately 1,900 to

2,300 square feet of living space with typical lot sizes of 3,000 square feet. The second neighborhood would include 92 four-bedroom homes ranging from approximately 2,200 to 2,700 square feet of living space with typical lot sizes of 2,850 and 3,375 square feet. Maximum heights would be 28 feet. In accordance with the City's Affordable Housing Program (AHP), the project includes 24 onsite below market rate (BMR) homes (8 at low-income level and 16 at moderate-income level) spread throughout the two neighborhoods, with 12 BMR homes in each neighborhood.

The proposed project would provide 6.91 acres of publicly owned and accessible open space and about 12.29 acres of privately owned, publicly accessible open space. The City proposes to develop a portion of the City-owned acreage into recreational facilities, including multiuse sports fields with permanent lighting for soccer, other field sports such as lacrosse and a practice field for baseball. Stormwater treatment facilities for the residential portion of the project would be primarily constructed in an easement within the City-owned acreage. Other smaller facilities would be located elsewhere on the site.

This EIR also evaluates a variant to the proposed project. In the variant, the residential component of the project would be unchanged, and the City would still develop a portion of the City-owned acreage into recreational facilities, including a multiuse field with permanent lighting. The differences between the project and the variant would be that the primary stormwater treatment basin for the residential project would be located within a triangular-shaped 0.75-acre parcel on private property as opposed to a location within an easement on City-owned property. Additionally, the project variant would include dedication of approximately 12.25 acres of land to the City for public open space, while the private open space in the sloped wooded areas would be about 7.51 acres.

ES.2 Project Objectives

The project includes the following objectives for the purposes of CEQA, which are also discussed in Chapter 2, *Project Description.*

1. Redevelop an underutilized site with a residential neighborhood that provides a variety of home sizes at a density that is compatible with the surrounding neighborhood.
2. Provide housing at a range of income levels (including low- and moderate-income households) that would assist the City in meeting its Regional Housing Needs Allocation (RHNA) targets.
3. Develop a project that is compatible with the existing biological setting and that provides improved management of preserved open space.
4. Provide wildland fire protection and maintenance of existing wooded areas.
5. Provide recreational fields and other public facilities and amenities to provide recreational opportunities, including providing for evening uses to maximize availability of the fields and facilities.

ES.3 Project Impacts and Mitigation Measures

ES.3.1 Impacts and Mitigation Measures

State CEQA Guidelines Section 15123(b)(1) requires that the summary identify each significant effect with proposed mitigation measures that would reduce or avoid that effect. Table ES-1 identifies the effects of the proposed project and the mitigation measures that would be implemented to reduce significant impacts, if applicable. The table also identifies significant and unavoidable impacts. Impact criteria where the conclusion is "no impact" or "less than significant" are included for completeness.

During the scoping process for this Draft EIR, the City of San Bruno determined that implementation of the proposed project and project variant would not result in significant environmental impacts on: Agriculture and Forestry Resources, and Mineral Resources. Therefore, these issues are not discussed in detail in this Draft EIR and are not included in Table ES-1.

Table ES-1. Summary of Environmental Impacts of the Proposed Project

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
3.1 Aesthetics			
Impact AES-1: Would the project would have a substantial adverse impact on a scenic vista?	Less than significant	–	–
Impact AES-2: Would the project substantially damage scenic resources within a state scenic highway?	Less than significant	–	–
Impact AES-3: In nonurbanized areas, would the project degrade the existing visual character or quality of public views of the site and its surroundings; in urbanized areas, would the project conflict with zoning or other regulations governing scenic quality?	Less than significant	–	–
Impact AES-4: Would the project introduce a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	Less than significant	–	–
3.2 Air Quality			
Impact AQ-1: Would the project conflict with or obstruct the implementation of the applicable air quality plan?	Less than significant	–	–
Impact AQ-2: Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard?	Potentially significant	**Mitigation Measure AQ-1: Require Implementation of BAAQMD Basic Best Management Practices for Construction-Related Fugitive Dust Emissions** The project sponsors shall require their contractors, as a condition of contracts (e.g., standard specifications), to reduce construction-related fugitive dust emissions by implementing BAAQMD's basic BMPs, including (but not limited to) the following measures. • All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material offsite shall be covered. • All visible mud or dirt trackout onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 mph. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. • All trucks and equipment, including their tires, shall be washed off prior to leaving the site. • Unpaved roads providing access to sites located 100 feet or farther from a paved road shall be treated with a 6- to 12-inch layer of compacted wood chips, mulch, or gravel. • Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air	Less than significant with mitigation

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations. For the residential component of the project, the project sponsor shall submit evidence of compliance to the City prior to grading permit issuance. For the recreational component, the City shall document compliance by its contractor.	
Impact AQ-3: Would the project expose sensitive receptors to substantial pollutant concentrations?	Less than significant	–	–
Impact AQ-4: Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Less than significant	–	–
3.3 Biological Resources			
Impact BIO-1: Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	Potentially significant	**Mitigation Measure BIO-1a: Conduct Preconstruction Survey for Dusky-footed Woodrat and Implement Appropriate Measures** Prior to project demolition/construction and prior to the vegetation maintenance activities that could potentially have an impact on woodrat nests, a qualified biologist shall conduct a preconstruction survey for San Francisco dusky-footed woodrat nests within and adjacent to the project footprint no more than 30 days prior to the onset of construction activities; demolition activities; and vegetation management activities that may impact woodrat nets, as defined in the vegetation management plan with input from a qualified biologist. This survey timing allows for the scheduling of and relocation of woodrat nests, if necessary. The survey shall encompass all construction zones and surrounding lands within 50 feet of these zones. All identified nests shall be avoided, where possible. Woodrat nests that occur within 50 feet of the project work area shall have a construction-free physical buffer established around them demarcated by flagging, exclusion fencing, or other suitable materials, as determined by a qualified biologist. If avoidance of a nest is not possible, the nest(s) shall be manually relocated when young are not present using the following methods. • To safely dismantle a nest, the dismantling process shall occur in October through December under the direction of a qualified biologist. If this timing is not feasible or compatible with the timing of construction, the biologist could dismantle the nest at a different time, but if baby woodrats (i.e., pups) are exposed during the process, the nest shall be rebuilt over the pups, and the nest shall be buffered for approximately 3 weeks before dismantling can recommence. To start dismantling, a landscape crew or other qualified crew shall be present onsite with the qualified biologist to clear vegetation for the qualified biologist to access the nest(s). All persons involved in the removal of materials (biologist and landscape crew) shall wear a respirator, long sleeves, and gloves during the disassembling and removal process to reduce the potential for exposure to hantavirus, rotavirus, and other diseases that woodrat nests may contain. Two to three temporary shelters such as an upside-down half-wine barrel or wooden box with rodent-sized opening shall be placed near the nest to be disassembled to provide any evicted woodrats a safe cover (refugia). Deconstruction of the nest shall be conducted by the biologist on the opposite side of the nest as temporary refugia so that woodrats have a direct path to the refugia. • Disassembling work shall be conducted by a qualified biologist in afternoon/evening hours to the extent practicable to limit stress to any evicted woodrats. Deconstructed nest material shall be placed on a tarp to either dispose of it or to use it to rebuild a nest with the same material in a different location. Materials on the tarp shall include structural, nesting chamber, and stored food. Relocation of nests shall be built as close as	Less than significant with mitigation

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		possible with a center chamber at the bottom with nesting material and food stores with sticks forming a chamber above this. If forming a nest chamber is difficult given the material of the original nest, additional sticks from the surrounding areas can be used or a wooden box with a hole cut for the entrance can be used based on the judgment of the qualified biologist. • Survey results and any disassembling and relocation work (if needed) shall be documented in a report provided to the city.	
		Mitigation Measure BIO-1b: Avoid Impacts on Nesting Birds To address impacts on nesting raptors and migratory birds, project-related activities (i.e., demolition, construction, vegetation management) that occur during the breeding season (February 1 through August 31) should be constrained in the vicinity of any active nests. If tree removal, use of powered equipment (e.g., chainsaws, line trimmers, mowers), or ground-disturbance activities are scheduled to commence during the breeding season, nesting bird surveys shall be conducted by a qualified biologist to identify possible nesting activity. A qualified biologist shall conduct preconstruction/pre-activity surveys for nests on any tree, other vegetation, or structure within 500 feet of the project/activity footprint no more than 14 days before demolition, construction, or vegetation management activities begin. If no active nests are found during focused surveys, no further action under this measure will be required. No tree shall be removed or trimmed if an active bird nest is present. If necessary, modifications to the project design to avoid removal of occupied habitat while still achieving project objectives shall be evaluated and implemented to the extent feasible. If avoidance of the nesting season is not feasible or conflicts with project objectives, demolition, construction, and vegetation management with powered equipment shall be prohibited within a buffer (generally 50 to 100 feet for songbirds and 250 to 500 feet for raptors, depending on the location and the professional judgment of the qualified biologist) of the nest to avoid disturbance until the nest is no longer active. Buffers may be reduced according to the discretion and professional judgment of the qualified biologist. The buffer shall be clearly marked and maintained until the young have fledged and are foraging independently. Prior to construction, demolition, or vegetation management activities, the qualified biologist shall conduct baseline monitoring of each nest to characterize "normal" bird behavior and establish a buffer distance, which allows the birds to exhibit normal behavior. The qualified biologist shall monitor the nesting birds during applicable activities and increase the buffer if birds show signs of unusual or distressed behavior (e.g., defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman/vegetation management lead shall have the authority to cease all work in the area until the young have fledged, and the nest is no longer active. A survey report shall be prepared and provided to the city to document the survey results. If monitoring is needed, the report shall also include the results of monitoring. An activity-free buffer of suitable dimensions must be established around any active raptor and migratory bird nests (generally 50 to 100 feet for songbirds and 250 to 500 feet for raptors, depending on the location and the professional judgment of the qualified biologist) for the duration of the construction, demolition, or vegetation management activity or until it has been determined that the chicks have fledged and are independent of their parents.	

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		Mitigation Measure BIO-1c: Avoid Impacts on Bats To address any potential impacts on bats, a preconstruction/predemolition or, for ongoing vegetation management activities, a pretree removal survey for roosting bats shall be conducted within the project/tree removal footprint and within a 50-foot buffer of the project footprint/tree removal footprint within 14 days before the start of those activities. If a nonbreeding or nonwintering bat colony is found, the individuals shall be humanely evicted via the partial dismantlement (two-step removal) of the trees or buildings prior to removal under the direction of a qualified biologist (with specialized knowledge of bats) to ensure that no harm or take would occur to any bats as a result of removal activities. If a maternity colony or overwintering colony is detected in the trees or buildings of the site, then a construction-free/activity-free buffer should be established around the tree(s) and/or building(s) and remain in place until it has been determined that the nursery or overwintering colony is no longer active. The size of the buffer shall be highly dependent on bat species, nesting/roosting location, level of existing disturbances, etc., and shall be decided at the discretion and professional judgment of a qualified biologist. A survey report shall be prepared and provided to the city to document the survey results. If monitoring is needed, the report shall also include the results of monitoring, which shall be the obligation of the applicant/developer with oversight by the City, with all costs, including City oversight costs, paid for by the applicant/developer.	
Impact BIO-2: Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	No impact	–	–
Impact BIO-3: Would the project have a substantial adverse effect on state- or federally protected wetlands (e.g., marshes, vernal pools, coastal wetlands) through direct removal, filling, hydrological interruption, or other means?	No impact	–	–
Impact BIO-4: Would the project substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedance of the use of native wildlife nursery sites?	No impact	–	–
Impact BIO-5: Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	Potentially significant	**Mitigation Measure BIO-5: Protect Retained Heritage Trees** The project proponent shall establish tree protection zones for retained heritage trees and specific measures to minimize impacts related to tree removal: • Project Design ○ Ensure adequate but not excessive water is supplied to trees; in most cases occasional irrigation will be required. Avoid directing runoff toward trees. • Tree Protection Zones ○ Establish a Tree Protection Zone around each tree to be preserved. For trees outside of the project site, the Tree Protection Zone shall be the existing fence line on all sides. ○ After tree removals are determined among the 182 perimeter trees surveyed, the project's security fence shall define the Tree Protection Zone. Fences are to remain until all grading and construction is completed. Where demolition must occur close to trees, such as removing curb and pavement, install trunk protection devices such as winding silt sock wattling around trunks or stacking hay bales around tree trunks.	Less than significant with mitigation

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		○ Any approved grading, construction, demolition, or other work within the Tree Protection Zone should be monitored by the consulting arborist. The arborist shall also determine approval for any root pruning for construction purposes outside the Tree Protection Zone. ○ All grading within the dripline of trees shall be done using the smallest equipment possible. The equipment shall operate perpendicular to the tree and operate from outside the Tree Protection Zone. Any modifications must be approved and monitored by the consulting arborist. • Open Space Management and Project Operations ○ A qualified arborist shall provide input on a management plan for the future open space areas that addresses ongoing management of heritage trees consistent with the guidance in this mitigation measure and with the San Bruno Tree Ordinance. The input shall address actions to protect retained heritage trees during ongoing vegetation management activities. ○ Use only herbicides safe for use around trees and labeled for that use, even below pavement. All pruning shall be done by a State of California Licensed Tree Contractor (C61/D49) who is a Certified Arborist or Certified Tree Worker and shall be conducted in accordance with the Best Management Practices for Pruning (International Society of Arboriculture 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300).	
Impact BIO-6: Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	No impact	–	–
3.4 Cultural Resources			
Impact CUL-1: Does the project have the potential to cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5), including physical demolition, destruction, relocation, or alteration of historical resources or their immediate surroundings, such that their significance would be materially impaired. The significance of a historical resource is considered materially impaired when a project demolishes or adversely materially alters those physical characteristics that convey its historical significance and that justify its eligibility for or inclusion in the CRHR or in registers meeting the definitions in PRC 5020.1(k) or 5024.1(g)?	No impact	–	–
Impact CUL-2: Would the project have the potential to cause a substantial adverse change in the significance of an archaeological resource, or potential disturbance to undiscovered archaeological resources (State CEQA Guidelines Section 15064.5)?	Potentially significant	**Mitigation Measure CUL-2a: Conduct Cultural Resource Awareness Training Prior to Project-Related Ground Disturbance and Stop Work if Archaeological Deposits Are Encountered During Ground-Disturbing Activities** Prior to any project- or project variant–related ground disturbance, the applicant and/or City shall ensure that all construction workers receive training overseen by a qualified professional archaeologist who is experienced in teaching nonspecialists to ensure that contractors can recognize archaeological resources in the event that any are discovered during construction. Construction staff directly overseeing excavation, or operating ground-disturbing vehicles during excavation activities, shall be required to participate in this preconstruction training.	Less than significant with mitigation

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		Mitigation Measure CUL-2b: Stop Work if Buried Cultural Deposits are Encountered During Construction Activities In the event that previously unidentified archaeological, historical, or tribal cultural resources are uncovered during site preparation, excavation, or other construction activity, the applicant and/or City shall cease or ensure the ceasing of all such activity within 50 feet of the discovery until the resources have been evaluated by a qualified professional (cultural resources specialist or archaeologist) and specific measures can be implemented to protect these resources in accordance with PRC Sections 21083.2 and 21084.1. Preservation in place (avoidance) is the preferred method of mitigation for impacts on cultural resources (State CEQA Guidelines Section 15126.4(b)(3)(A)) and is required unless the cultural resources specialist or archaeologist determines that another method would provide superior mitigation of impacts on the resource. No additional mitigation is necessary if the resource can be completely avoided, but the resource shall be recorded on Department of Parks and Recreation (DPR) 523 forms, which shall be filed with the Northwest Information Center. The qualified cultural resources specialist shall follow the procedures below if the resource cannot be completely avoided: • Determine if the resource is an historical resource: The qualified cultural resources specialist or archaeologist shall determine if there is a potential for the resource to be a historical resource. Work can resume if there is no potential for the resource to qualify as a historical resource. If there is a potential for the resource to be a historical resource, the qualified cultural resources specialist or archaeologist shall prepare an Evaluation Plan. • Prepare an Evaluation Plan: The Evaluation Plan shall be prepared specific to the resource and shall contain procedures used to determine if the discovered resource is an historical resource. The Evaluation Plan shall include enough discussion of background and context to provide for evaluation of the resource under the historical resource criteria. It shall include a description of procedures that will be used to gather information for the evaluation, which may include but not be limited to excavation, written documentation, interviews, and photography. For any archaeological resource testing, the Evaluation Plan shall describe testing procedures, such as surface collection, test excavations, analysis methods, and reporting procedure. • Implement Evaluation Plan: The evaluation plan shall be implemented in the field, and the subsequent report shall evaluate the resource based on the criteria contained in the Evaluation Plan, making a conclusion whether the resource is historical. If the resource is not historical, protective barriers can be removed and work can continue in the area. If the resource is historical, the qualified cultural resources specialist or archaeologist shall prepare a Data Recovery Plan. • Prepare a Data Recovery Plan: A Data Recovery Plan shall be prepared consistent with State CEQA Guidelines Section 15126.4(b)(3)(C) and Public Resources Code Section 21083.2. The Data Recovery Plan will contain a description of how data recovery will mitigate impacts on the resource to less than significant. It shall contain a description of level of effort (e.g., quantity of excavation units), excavation procedures, laboratory methods, types of samples to be collected (e.g., sediment), and the techniques that will be used to obtain information about the features of the site that make it a historical resource. Additionally, the Data Recovery Plan shall include a description of	

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		the reporting procedure. Once the Data Recovery Plan is completed, field work can commence. Work can resume in the area once the qualified cultural resources specialist/archaeologist determines that no additional information needs to be recovered to satisfy fieldwork, reporting, and documentation requirements to reduce impacts to less than significant. • Prepare a Data Recovery Report: A Data Recovery Report shall be prepared following completion of data recovery field work. The Report shall present results of data recovery, including field methods used, location and size of excavations, and analysis of materials recovered. It shall contain conclusions made based on the field work as well as where any recovered artifacts, samples, and documentation will be curated. Curation facilities must meet requirements of 36 Code of Federal Regulations 79. The Data Recovery Report shall be submitted to the Northwest Information Center, with all impacted known resources recorded on DPR 523 forms.	
Impact CUL-3: Would the project have the potential to disturb or potentially disturb any undiscovered human remains, including those interred outside of formal cemeteries?	Less than significant	–	–
3.5 Energy			
Impact EN-1: Would the project result in wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	Less than significant	–	–
Impact EN-2: Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	Less than significant	–	–
3.6 Geology, Soils, and Paleontological Resources			
Impact GEO-1: Would the project result in potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides?	No impact	–	–
Impact GEO-2: Would the project result in substantial soil erosion or the loss of topsoil?	Less than significant	–	–
Impact GEO-3: Would the project result in the placement of project-related facilities on a geologic unit or soil that is unstable or has expansive soil or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	Less than significant	–	–
Impact GEO-4: Would the project result in placement of facilities on soils 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?	No impact	–	–
Impact GEO-5: Would the project result in direct or indirect destruction of a unique paleontological resource or site or unique geologic feature?	Potentially significant	**Mitigation Measure GEO-5: Provide Construction Personnel Training and Follow Unanticipated Paleontological Resources Discovery Protocol** Prior to commencement of ground-disturbing activities, project personnel conducting ground-disturbing activities shall receive training regarding the potential for uncovering subsurface paleontological resources (a fossilized bone or other preserved plant or animal remains), work practices for implementing mitigation measures and complying with applicable laws and regulations, and how to recognize possible buried resources. The training shall include a presentation of procedures to follow upon discovery or suspected	Less than significant with mitigation

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		discovery of paleontological resources, their treatment (described below) and actions that may be taken if there is violation of applicable laws. If a previously undiscovered paleontological resource is encountered during construction, ground-disturbing activity within 100 feet of the resource shall be stopped. A qualified paleontological resource specialist shall be retained to assess the significance of the find. An exclusion area shall be established with signage and protective barriers. Entry into the area shall be limited to authorized personnel and a qualified paleontological resource specialist, and the contractor shall immediately notify the City of San Bruno. Preservation in place (avoidance) is preferred mitigation for impacts on unique paleontological resources. No additional mitigation is necessary if the resource can be avoided, but the qualified paleontological resource specialist shall document the resource in accordance with professional standards such as the *Society of Vertebrate Paleontology Standard of Procedures for the Assessment of Adverse Impacts to Paleontological Resources* (SVP 2010). A significant paleontological resource under these standards is defined as follows. > Significant paleontological resources are fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years). Work can resume if there is no potential for the resource to be a unique paleontological resource. If there is a potential for the resource to be a unique paleontological resource and it cannot be avoided, the qualified paleontological resource specialist shall identify mitigation measures, which may include ensuring that fossils are recovered, prepared, identified, catalogued, and analyzed consistent with current professional standards. Methods of recovery, testing, and evaluation shall adhere to current professional standards such as the *Society of Vertebrate Paleontology Standard of Procedures for the Assessment of Adverse Impacts to Paleontological Resources* (SVP 2010). Work can commence after data recovery.	
3.7 Greenhouse Gas Emissions			
Impact GHG-1: Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Potentially significant	**Mitigation Measure TRA-2: Implement Transportation Demand Management Program** See Impact TRA-2 for full text.	Significant and unavoidable
Impact GHG-2: Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Potentially significant	**Mitigation Measure TRA-2: Implement Transportation Demand Management Program** See Impact TRA-2 for full text.	Significant and unavoidable
3.8 Hazards and Hazardous Materials			
Impact HAZ-1: Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less than significant	–	–
Impact HAZ-2: Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	Less than significant	–	–
Impact HAZ-3: Would the project cause emission of hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	No impact	–	–

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact HAZ-4: Would the project involve the placement of project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and resulting creation of a significant hazard to the public or the environment?	No impact	–	–
Impact HAZ-5: Would the project place facilities within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project area?	Potentially significant	**Mitigation Measure HAZ-5a: FAA Part 77 Determination or Documentation of Exception for Residential Component** The project sponsor for the residential component of the proposed project shall obtain a determination of no-hazard from the FAA when notification under 14 C.F.R. Part 77 is required for any component of the residential portion of the proposed project. The project sponsor shall provide documentation of the FAA finding to the City prior to the use of equipment or installation of structures that require notification under 14 C.F.R. Part 77. Alternatively, the project sponsor can provide documentation that notification is not required under 14 C.F.R. Part 77.9(e) should it be found that new structures "will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height, and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation." Such documentation shall be provided to the City prior to the start of construction of the residential component of the proposed project.	Less than significant with mitigation
		Mitigation Measure HAZ-5b: FAA Part 77 Determination for Recreation Component The City shall obtain a determination of no-hazard from the FAA when notification under 14 C.F.R. Part 77 is required for any component of the recreation portion of the proposed project, such as the light standards. The City shall obtain documentation of the FAA finding prior to the use of equipment or installation of structures that require notification under 14 C.F.R. 77.	
Impact HAZ-6: Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	Less than significant	–	–
Impact HAZ-7: Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	Less than significant	–	–
3.9 Hydrology and Water Quality			
Impact WQ-1: Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	Less than significant	–	–
Impact WQ-2: Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	Less than significant	–	–
Impact WQ-3: Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: (1) result in substantial erosion or siltation on- or offsite; (2) substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or offsite; (3) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or (4) impede or redirect flood flows?	Less than significant	–	–

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
Impact WQ-4: Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less than significant	–	–
Impact WQ-5: Would the project be in a flood hazard, tsunami, or seiche zone, and risk the release of pollutants as a result of project inundation?	No impact	–	–
Impact WQ-6: Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	No impact	–	–
3.10 Land Use			
Impact LU-1: Would the project cause a physical division of an established community?	No impact	–	–
Impact LU-2: Would the project conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	No impact	–	–
3.11 Noise			
Impact NOI-1: Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies?	Potentially significant (construction)	**Mitigation Measure NOI-1a: Require Construction Noise Reduction Measures** The following measures shall be incorporated into the project onsite construction activities in order to ensure compliance with the noise standards pertaining to construction noise contained in the City of San Bruno Municipal Code. In cases where a measure is considered infeasible (e.g., construction is needed outside allowable hours), the Planning Director shall review and approve that determination prior to that activity occurring to verify and track compliance with this measure. • Noise-generating construction activities shall be limited to the hours of 7:00 a.m. to 10:00 p.m., as feasible. • Combined construction noise for activities that take place between 7:00 a.m. and 10:00 p.m. shall be limited to 85 dBA L_{eq} at a distance of 100 feet from construction activities, as feasible. • Should noise-generating construction activities be required between 10:00 p.m. and 7:00 a.m., combined construction noise shall be limited to 60 dBA L_{eq} at a distance of 100 feet from construction activities, as feasible. • Temporary construction noise levels shall not result in an increase of 10 dBA or greater. • Measures to achieve these performance standards include: ○ All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition. ○ All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity. ○ Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible. ○ Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from existing noise-sensitive uses. ○ Nearby residences that border the project site, and the church located on the east side of Courtland Drive, shall be notified of construction schedules	Less than significant with mitigation (construction)

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels. ○ The name and telephone number of an onsite construction liaison who is available whenever construction is occurring shall be provided through onsite signage and on the notices mailed/delivered to surrounding land uses. If early morning or nighttime construction occurs, and construction noise during this time is found to be intrusive to the community (i.e., if complaints are received), the construction liaison shall take reasonable efforts in a reasonable amount of time to investigate the source of the noise (including measuring noise levels) and require that sensible measures be implemented to correct the problem. **Mitigation Measure NOI-1b: Install Temporary Noise Barriers** In the event that investigation of construction noise-related complaints by the construction liaison required by mitigation measure NOI-1a indicates that project construction activities are resulting in increases in ambient noise levels at nearby residential uses of 10 dBA or more, temporary noise barriers shall be installed as close as possible to the noise source or the receptor and positioned within the direct line-of-sight path between the noise source and nearby sensitive receptor(s), if feasible. In cases where this measure is required but considered infeasible (e.g., construction is needed outside allowable hours and noise barriers cannot be installed), the Planning Director shall review and approve that determination prior to that activity occurring to verify and track compliance with this measure. The barrier should be constructed of material that has a surface weight of at least 1 pound per square foot and has an acoustical rating of at least 25 STC (Sound Transmission Class). This can include a temporary barrier constructed with plywood support on a wood frame, sound curtains supported on a frame, or other comparable material.	
Impact NOI-2: Would the project generate excessive groundborne vibration or groundborne noise levels?	Less than significant	–	–
Impact NOI-3: Would the project place of project-related activities in the vicinity of a private airstrip or an airport land use plan or within 2 miles of a public airport or public use airport, resulting in exposure of people residing or working in the project area to excessive noise levels?	No impact	–	–
3.12 Population and Housing			
Impact POP-1: Would the project create substantial unplanned population growth either directly or indirectly?	Less than significant	–	–
Impact POP-2: Would the project displace a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere?	No impact	–	–
3.13 Public Services			
Impact PS-1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or response times for fire protection?	Less than significant	–	–
Impact PS-2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant	Less than significant	–	–

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection?			
Impact PS-3. Would this project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable performance objectives for schools?	Less than significant	–	–
Impact PS-4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios or other performance objectives for libraries?	Less than significant	–	–
3.14 Recreation			
Impact REC-1: Would the project increase use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would not occur or be accelerated?	Less than significant	–	–
Impact REC-2: Does the project include recreational facilities or require construction or expansion of recreational facilities that would have an adverse physical effect on the environment?	Less than significant	–	–
3.15 Transportation			
Impact TRA-1: Would the project conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities?	Less than significant	–	–
Impact TRA-2: Would the project conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b)?	Potentially significant	**Mitigation Measure TRA-2: Implement Transportation Demand Management Program** Prior to the issuance of the first building permit for the residential component of the project, the applicant shall submit to the Community Development Director a TDM program that aims to reduce residential VMT to 12.4 miles per capita, consistent with a 15 percent reduction in VMT from the current regional average of 14.6 miles per capita. At minimum, the TDM program shall include an HOA transportation alternatives marketing program to reduce VMT from the residential component of the project. The marketing program is expected to achieve up to a 4 percent trip (and VMT) reduction below ITE trip generation rates. Additional measures shall be included in the TDM program that, at the time the TDM program is submitted, are feasible, and appropriate for the residential component of the project, considering the proposed use and its location and size, in an effort to reduce VMT from the residential component of the project as indicated by the	Significant and unavoidable

performance standard of this mitigation measure (12.4 miles per capita). Other measures that may be considered include but are not limited to, the following.

- Pre-Sale Marketing Program
  - New Owner Trip Reduction Pledge (sales program)
  - Pre-sales Trip Reduction Information
  - New Owner TDM/Trip Reduction Welcome Packet
  - TDM Plan - Purchase Contract/Escrow Disclosures
- Bike Parking Facilities
  - Add Class II bike racks to HOA park
  - Add bike repair fix-it station to HOA park
- Resident Incentive Program
  - Prizes and rewards (bike, carpool, and vanpool)
  - Quarterly promotions
- Voluntary Travel Behavior Change Program (includes Commuter Coordinator, annual survey, and reporting)
- Travel Behavioral Intervention (on-site annual event)
- Education, Marketing, and Outreach
- Online HOA Commuter Resource webpage
- Ride-Sharing (carpool matching) Programs (marketing/outreach)
- School Pool Programs (marketing/outreach)
- Onsite E-Bike Subsidy Program

The applicant or HOA, as an alternative means of achieving all or a portion of the VMT reductions, has the option to participate in any adopted applicable VMT mitigation fee, bank or exchange program that would allow development projects to offset project VMT impacts by contributing money into a program to fund offsite VMT reducing projects or programs (such as, but not limited to, dedicated bike lanes, community shuttles, transit service improvements, roadway gap closures, or pedestrian network expansion). To be eligible, the mitigation fee, bank, or exchange program would need to meet the following requirements.

- **Real/verifiable:** Identifies actual projects that would be implemented under the program within a reasonable period of time of the contribution as well as the expected attributable VMT reduction from each project.
- **Additional:** Projects implemented under the program would not be implemented if not for the financial contribution to the program.
- **Measurable/Enforceable:** Contains VMT reduction metrics that provide for conversion of the financial contribution to the program to an equivalent VMT reduction that can be applied to the project.

The applicant shall implement any pre-sale marketing component of the TDM program commencing upon initial marketing activities. The HOA shall implement the balance of the TDM program commencing upon full occupancy of the residential component of the project.

The Community Development Director may approve modifications to the residential TDM plan proposed by the applicant or the HOA that are consistent with the original findings and conditions approved by the review authority. A request to modify the TDM plan may only be granted if it is demonstrated to be at least as effective as the original TDM plan in furthering the transportation goals of the San Bruno General Plan by promoting and increasing transit use, ridesharing, walking, and bicycling to minimize the number of residents traveling in single-occupant vehicles and improving the mobility and general

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		efficiency of circulation and transportation systems by reducing single-occupant vehicle trips and total VMT within the community and the region. The residential TDM program shall include annual monitoring and reporting requirements completed by a neutral third party on the effectiveness of the onsite component of the TDM program for the first 5 years after full site buildout. The HOA shall submit an annual report documenting the TDM activities undertaken and their results to the Community Development Director. The Community Development Director or designee shall evaluate the overall effectiveness of all TDM activities and may suggest new, modified, or substitute activities that are reasonable, feasible, and appropriate for the residential component of the project, considering the proposed use and its location, to meet the program's objectives. Annual reporting requirements include information on the TDM marketing program, site occupancy, resident mode share, work-from-home rates, and use of alternative modes. For the first year after full occupancy, the onsite monitoring report must also include a 24-hour screenline vehicle count across all the residential neighborhood street gateways. This count shall be compared to the trip generation estimates prepared as part of the project EIR and will serve as a guidepost for compliance with the 4 percent onsite reduction target. The HOA may need to supplement the marketing program with other measures if initial monitoring results show limited usage of alternative modes and higher than expected trip counts.	
Impact TRA-3: Would the project substantially increase in hazards due to a geometric design feature (e.g., sharp curves, dangerous intersections) or incompatible uses (e.g., farm equipment)?	Less than significant	–	–
Impact TRA-4: Would the project result in inadequate emergency access?	Less than significant	–	–
3.16 Tribal Cultural Resources			
Impacts TCR-1 and TRC-2: Would the project cause a substantial adverse change in the significance of a tribal cultural resource that is (a) listed or eligible for listing in the CRHR or in a local register of historical resources, as defined in PRC Section 5020.1(k), or (b) determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1?	Potentially significant	**Mitigation Measure CUL-2a: Conduct Cultural Resource Awareness Training Prior to Project-Related Ground Disturbance and Stop Work if Archaeological Deposits are Encountered During Ground-Disturbing Activities** See Impact CUL-2 for full text. **Mitigation Measure CUL-2b: Stop Work if Buried Cultural Deposits are Encountered during Construction Activities** See Impact CUL-2 for full text.	Less than significant with mitigation
3.17 Utilities and Service Systems			
Impact UT-1: Would the project require or result in relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, with the potential to cause significant environmental effects?	Potentially significant	**Mitigation Measure UT-1a: Rehabilitate Sanitary Sewer within Courtland Drive and Whitman Way.** In coordination with City of San Bruno Public Works, the proponent of the residential component of the proposed project shall rehabilitate approximately 929 linear feet of sewer main on Courtland Drive (from MH 1874 to MH 1222) and approximately 740 linear feet of sewer main on Whitman Way (from MH 1222 to MH 1331). **Mitigation Measure UT-1b: Upgrade Water System Regulator Station 13.** In coordination with City of San Bruno Public Works, the proponent of the residential component of the proposed project shall upgrade regulator station RS-13 to meet or exceed the minimum fire flow requirements for the project of 500 gpm. The upgrade will consist of abandoning the existing RS-13, rerouting piping to install a new regulating station in the vicinity of the existing RS-13,	Less than significant

Environmental Impact	Significance before Mitigation	Mitigation Measures	Significance after Mitigation
		with the proper-sized valves, and piping to meet or exceed the minimum fire flow requirement.	
Impact UT-2: Would this project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	Less than significant	–	–
Impact UT-3: Would the project result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	Less than significant	–	–
Impact UT-4: Would the project generate solid waste in exceedance of state or local standards, or in excess of the capacity of local infrastructure, or other impediment to the attainment of solid waste reduction goals?	Less than significant	–	–
Impact UT-5: Would the project fail to comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Less than significant	–	–
3.18 Wildfire			
Impact WF-1: Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?	Less than significant	–	–
Impact WF-2: Would the project, due to slope, prevailing winds, or other factors, exacerbate risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	Less than significant	–	–
Impact WF-3: Does the project require the installation or maintenance of project-associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment?	Less than significant	–	–
Impact WF-4: Would the project expose people or structures to significant risks such as downslope or downstream flooding or landslide as a result of runoff, postfire slope instability, or drainage changes?	No impact	–	–

ES.3.2 Impacts and Alternatives

State CEQA Guidelines Section 15123(b)(1) requires that the summary identify each significant effect with alternatives that would reduce or avoid that effect. The following alternatives are considered and would reduce or avoid a significant effect.

- **Alternative 1: Increased Density with ADUs, Open Space, and Recreation.** This alternative would result in a substantial reduction of Impact GHG-1, Impact GHG-2, and Impact TRA-2 due to its reduction of VMT; however, impacts would not be reduced to less than significant.
- **Alternative 2: Reduced Density:** This alternative would result in a substantial reduction of Impact NOI-1 due to the decrease in units and construction noise; however, impacts would not be reduced to less than significant.

ES.4 Potential Areas of Controversy

State CEQA Guidelines Section 15123(b)(2) specifies that a Draft EIR summary must identify "areas of controversy" that are known to the lead agency, including issues that were raised by agencies and the public. Based on scoping input and information from other forms of outreach, the City has identified increased traffic, temporary displacement of recreationists, the settlement agreement between the City of San Bruno and the San Mateo Union High School District, and lighting use at the proposed recreation facility as potential areas of controversy.

ES.5 Issues to be Resolved

State CEQA Guidelines Section 15123(b)(3) specifies that a Draft EIR summary must identify issues that are to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects.

Chapter 3, *Environmental Impact Analysis*, of this Draft EIR presents mitigation measures to reduce or avoid the significant impacts that have been identified for the project. In some instances, the Draft EIR identifies mitigation options to address specific impacts. During the CEQA environmental review process and project consideration, the City will need to resolve which mitigation measures are suitable and whether they can effectively reduce impacts to a less-than-significant level. A Mitigation Monitoring and Reporting Program (MMRP) will be prepared to define the timing for implementation of the measures, the parties that will be responsible for implementation, and the parties that will be responsible for reporting and verifying implementation.

The Draft EIR identifies impacts that would remain significant and unavoidable, even after implementation of the proposed mitigation measures. Consequently, the City will need to determine whether to approve the project as proposed and, if so, provide its rationale in a Statement of Overriding Considerations.

Chapter 4, *Alternatives*, of the Draft EIR presents alternatives to the project. The City will need to resolve whether any the alternatives presented are preferable from an environmental and community perspective compared with the proposed project and project variant.

Chapter 1
Introduction

This draft environmental impact report (Draft EIR) evaluates the environmental impacts of the proposed 300 Piedmont Avenue Project (project) and project variant, which propose to develop an approximately 40.2-acre site into a new 155-lot, single-family, detached-home community with associated open space and infrastructure located at 300 Piedmont Avenue (project site). The project would also demolish the former Crestmoor High School and other existing structures on the project site. Chapter 2, *Project Description*, provides a more detailed description of the project and the project variant.

1.1 California Environmental Quality Act

1.1.1 Purpose of This Environmental Impact Report

As the lead agency for the project, the City of San Bruno (City) prepared this Draft EIR in accordance with the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21000 et seq.) and the State CEQA Guidelines (California Code of Regulations [CCR] Section 15000 et seq.).

The lead agency is the public agency with principal responsibility for carrying out or approving a project.

This Draft EIR assesses potentially significant impacts that could result from the project and project variant. As defined in State CEQA Guidelines Section 15382, a "significant effect on the environment" is:

> …a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

As stated in the State CEQA Guidelines, an EIR is an "informational document." It is intended to inform public agency decision makers and the public of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to a project. The purpose of this Draft EIR is to provide the City, responsible and trustee agencies, other public agencies, and the public with detailed information about the environmental effects that could result from implementing the project and project variant; examine and set forth feasible methods of mitigating any adverse environmental impacts should the project or project variant be approved; and consider feasible alternatives to the project and project variant. The City will use the EIR, along with other information in the public record, to determine whether to approve, modify, or deny the project and specify any applicable environmental conditions or mitigation measures as part of the project approvals.

1.1.2 Scope of This Draft Environmental Impact Report

Pursuant to CEQA (PRC Section 21000 et seq.) and State CEQA Guidelines Section 15064, the discussion of potential effects on the environment in the EIR are focused on those impacts that the City has determined may be potentially significant. The EIR also evaluates the cumulative impacts of the project and project variant when considered in conjunction with other related past, current, and reasonably foreseeable future projects. CEQA requires that the discussion of any significant effect on the environment be limited to substantial, or potentially substantial, adverse changes in physical conditions that exist within the affected area, as defined in PRC Section 21060.5 (statutory definition of "environment").

The city has determined that the project could result in potential environmental impacts in the following topic areas, which are evaluated in the EIR.

- Aesthetics
- Air quality
- Biological resources
- Cultural resources
- Energy
- Geology and soils
- Greenhouse gases
- Hazards and hazardous materials
- Hydrology and water quality
- Land use and planning
- Noise and vibration
- Population and housing
- Public services
- Recreation
- Transportation
- Tribal cultural resources
- Utilities
- Wildfire

CEQA allows a lead agency to limit the detail of discussion of the environmental effects that are not considered potentially significant (PRC Section 21100, CCR Sections 15126.2[a] and 15128). Environmental issue areas that were dismissed from further consideration in the EIR are mineral resources and agriculture and forestry resources. A detailed analysis of these topics is, therefore, not included in this Draft EIR. Refer to Chapter 3, *Environmental Impact Analysis*, *Impacts Requiring No Further Analysis*, for further discussion.

1.1.3 Impact Analysis

This EIR analyzes significant effects that could result from the project and project variant. As explained in Section 15002(g) of the State CEQA Guidelines, a significant effect on the environment is defined as a substantial adverse change in the physical conditions that exist in the area affected by a project. Pre-project environmental conditions (the environmental baseline) are considered in determining impact significance. The impact significance thresholds for each environmental resource area presented in this Draft EIR are based on State CEQA Guidelines Appendix G, Environmental Checklist Form (supplement or revised as appropriate to fit the proposed project). Where significant impacts are identified, the Draft EIR recommends feasible mitigation measures to reduce, eliminate, or avoid the significant impacts and identifies which impacts remain significant and unavoidable despite the mitigation measures. Cumulative impacts (i.e., two or more individual effects, either from a single project or from two or more separate projects, that, when considered together, compound or increase other related environmental impacts) are discussed for each environmental resource area.

In accordance with State CEQA Guidelines Section 15143, this Draft EIR analyzes the significant effects on the environment that could result from construction and operation of the project. State CEQA Guidelines Section 15131 specifies that "…the intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes." Therefore, this Draft EIR does not treat economic or social effects of the project or project variant as significant effects on the environment, unless they result in physical changes to the environment. In addition, if it is determined that a potential impact is too speculative for evaluation, this condition is noted, and further discussion of the impact is not necessary.

1.2 Intended Use of this Environmental Impact Report

As stated previously, the purpose of this EIR is to disclose and assess the potential environmental impacts associated with the adoption and implementation of the proposed project and project variant, and to determine corresponding mitigation measures as necessary. This Draft EIR meets the requirements of a project EIR, as defined by State CEQA Guidelines Section 15161. A project EIR focuses on the changes in the physical environment that would result from the implementation of a project, including its planning, construction, and operation.

1.3 Project Overview

The project site is located on a 40.2-acre parcel at 300 Piedmont Avenue in the City of San Bruno. Piedmont Avenue becomes Courtland Drive (a private driveway with a public access easement) at the southern entrance to the project site and runs north–south along and close to the eastern edge of the site. Interstate 280 (I-280) runs directly east of Courtland Drive, with the San Bruno Chinese Church located between Courtland Drive and I-280 near the northern entrance to the project site and a vegetated area otherwise separating the two roadways. Vehicular access is provided to the project site from Piedmont Avenue at the southern entrance and Courtland Drive at its northern entrance.

The project site currently contains the former Crestmoor High School, as well as playing fields, parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. Crestmoor High School closed in 1980, and Peninsula Alternative High School occupied a portion of the buildings until it vacated its portion of the project site in 2021. In the interim, the site was used for operations such as the San Mateo County Superior Court (early 1990s), and a preschool (2000s–2020) and a church (2011–2017) (ESA 2022). It has therefore been maintained over the years, though there has been some natural degradation. The high school campus is currently vacant, although the recreational fields are being used by two soccer leagues. The sloped areas on the west side of the campus have been minimally maintained and are densely wooded, dominated by Monterey pine (*Pinus radiata*) and red gum eucalyptus (*Eucalyptus camaldulensis*) trees with a dense shrub layer. Existing single-family subdivisions neighbor the project site to the north, west, and south across substantial grade changes, with a wooded hillside buffer. Within the existing developed area, the project site rises approximately 44 feet from north to south.

The project would involve demolishing the existing structures on the site and establishing a new 155-lot, single-family, detached-home community with associated open space and infrastructure. One neighborhood would include 63 four-bedroom homes ranging from approximately 1,900 to 2,300 square feet of living space with typical lot sizes of 3,000 square feet. The second neighborhood would include 92 four-bedroom homes ranging from approximately 2,200 to 2,700 square feet of living space with typical lot sizes of 2,850 and 3,375 square. A ring road would provide circulation around the perimeter of the residential lots, with east–west drives throughout.

The proposed project would provide 6.91 acres of publicly owned and accessible open space and about 12.29 acres of privately owned but also publicly accessible open space (i.e., a total of 19.2 acres of publicly accessible open space). The City proposes to develop a portion of the City-owned acreage into recreational facilities, including multiuse sports fields with permanent lighting for soccer and other field sports such as lacrosse, and a practice field for baseball. Stormwater treatment facilities for the residential portion of the project would be primarily constructed in an easement within the City-owned acreage. Other smaller facilities would be located elsewhere on the site.

This EIR also evaluates a *variant* to the proposed project. In the variant, the residential component of the project would be unchanged, and the City would still develop a portion of the City-owned acreage into recreational facilities, including a multiuse field with permanent lighting. The differences between the project and the variant would be that the primary stormwater treatment basin for the residential project would be located within a triangular-shaped 0.75-acre parcel on private property as opposed to a location within an easement on City-owned property. Additionally, the project variant would include dedication of approximately 12.24 acres of land to the City for public open space, while the private open space would be about 7.51 acres (i.e., a total of 12.24 acres of publicly accessible open space).

1.4 California Environmental Quality Act Process

1.4.1 Notice of Preparation and Scoping Meeting

The term *scoping* refers to the process used to assist the lead agency in determining the focus and content of an EIR. Scoping solicits input on the potential topics to be addressed in an EIR, the range of project alternatives, and possible mitigation measures. Scoping is also helpful in establishing methods of assessment and selecting the environmental effects to be considered. The scoping process for this EIR was initiated on April 10, 2023, when the City submitted the Notice of Preparation (NOP) to the California State Clearinghouse for distribution to the necessary parties. The NOP is included as Appendix A of this EIR. The purpose of the NOP is to solicit participation from relevant agencies and from the public in determining the scope of an EIR. The scoping period for this EIR ended on May 11, 2023, and a public scoping meeting was held on April 18, 2023, at the San Bruno Senior Center (1555 Crystal Springs Road, San Bruno, California 94066). Comments received during the scoping process are on file at the City of San Bruno Community Development Department (567 El Camino Real, San Bruno, California 94066).

The following verbal comments were received at the scoping meeting.

- Concerns about budget and management of City-owned open space between Courtland and I-280.

- Comments related to a preference for using turf.
- Concerns about traffic safety.
- Whether there would be an HOA.
- Whether parks in the residential component would be open to the whole community.
- Whether the EIR will evaluate the project in light of the Housing Element.
- A desire for a proper restroom at the recreational fields.
- A question about undergrounding utilities.
- Concerns about temporary access to recreational fields during construction.

In response to the NOP, letters were received from the following individuals, agencies, and organizations.

- San Francisco International Airport
- OneShoreline
- Native American Heritage Commission
- Pamela Madden
- Michael Bryan
- Rich Fern

These letters are included in Appendix A, *Notice of Preparation and Scoping Letters*.

1.5 Environmental Impact Report Organization

This EIR is organized into the following chapters.

Executive Summary. The Executive Summary provides a summary of the project and project variant and the impacts that would result from implementation of the project, along with mitigation measures recommended to reduce, eliminate, or avoid significant impacts. The Executive Summary also discusses alternatives to the project and project variant.

Chapter 1, *Introduction*. Chapter 1 discusses the overall purpose of the EIR, provides a summary of the project and project variant and the CEQA process, and summarizes the organization of the EIR.

Chapter 2, *Project Description*. Chapter 2 describes the project site, project objectives, required approvals process, and project characteristics. It also describes the project variant.

Chapter 3, *Environmental Impact Analysis*. Chapter 3 describes the existing conditions/setting, analyzes the environmental impacts, and provides mitigation measures (if applicable) for each environmental resource area.

Chapter 4, *Alternatives*. Chapter 4 evaluates alternatives to the project and project variant, in addition to the No-Project Alternative, and explains why various other alternatives that were considered were not carried forward for detailed evaluation in the EIR.

Chapter 5, *Other CEQA Considerations*. Chapter 5 provides additional, specifically required analyses of the project's and project variant's cumulative effects, significant irreversible changes, induced growth, urban decay, and energy conservation.

Chapter 6, *List of Preparers*. Chapter 6 lists the authors of the EIR, as well as persons and organizations that were consulted during the preparation of the EIR.

Chapter 7, *References*. Chapter 7 provides full references for all information cited in the EIR.

Appendices: Appendices are referenced throughout the EIR and included as attachments.

Chapter 2
Project Description

This chapter of the draft environmental impact report (EIR) describes the project, which consists of the proposed residential development, open space, and recreational uses. SummerHill Homes (project sponsor) proposes to develop an approximately 40.2-acre site into a new 155-lot single-family, detached-home community with associated open space and infrastructure located at 300 Piedmont Avenue (project site) in the City of San Bruno (the City). The City also proposes to construct new recreational amenities on a portion of the project site. The Crestmoor, 300 Piedmont Avenue Project (project) would also demolish the former Crestmoor High School and other existing structures on the project site.

In addition, pursuant to a settlement agreement between the City of San Bruno and the San Mateo Union High School District, the owner of the project site, the EIR analyzes a variant to the project that reflects: (1) dedication of a 6.47-acre portion of the project site's wooded slope area to the City as publicly accessible open space, which would thereafter be maintained by the City; (2) retention of approximately 7.5 acres of sloped area as private open space; and (3) dedication of a smaller space to the City for athletic field and recreational supportive uses. Overall, the variant would result in 12.24 acres of publicly accessible open space as compared to the 19.2 acres of publicly accessible open space and would shift maintenance obligations for 6.47 acres of sloped wooded area from the property owner to the City.

2.1 Project Location and Setting

2.1.1 Project Location and Access

The project site is located on a 40.2-acre parcel (assessor's parcel number 019-170-020) at 300 Piedmont Avenue in the City of San Bruno. Figure 2-1 shows the project location and project area. Piedmont Avenue becomes Courtland Drive (a private driveway with a public access easement) at the southern entrance to the project site and runs north–south along and close to the eastern edge of the project site. Interstate 280 (I-280) runs east of Courtland Drive, with the San Bruno Chinese Church located between Courtland Drive and I-280 near the northern entrance to the project site and a vegetated area otherwise separating the two roadways. Vehicular access is provided to the project site from Piedmont Avenue at the southern entrance and Courtland Drive at its northern entrance.

2.1.2 Project Setting

Project Site

The project site currently contains the former and currently unoccupied Crestmoor High School, constructed in 1962, as well as playing fields, parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. The high school campus is currently vacant. Crestmoor High School closed in 1980, and Peninsula Alternative High School vacated the project site in 2021. In the interim, the site was used for operations such as the San Mateo County Superior

Court (early 1990s) and a preschool (2000s–2020) and a church (2011–2017) (ESA 2022). It has therefore been maintained over the years, though there has been some natural degradation. The sloped areas on the west side of the campus have been minimally maintained and are densely wooded, dominated by Monterey pine and red gum eucalyptus trees with a dense shrub layer. Existing single-family subdivisions neighbor the project site to the north, west, and south across substantial grade changes, with a wooded hillside buffer. Within the existing developed area, the project site rises approximately 44 feet from north to south.

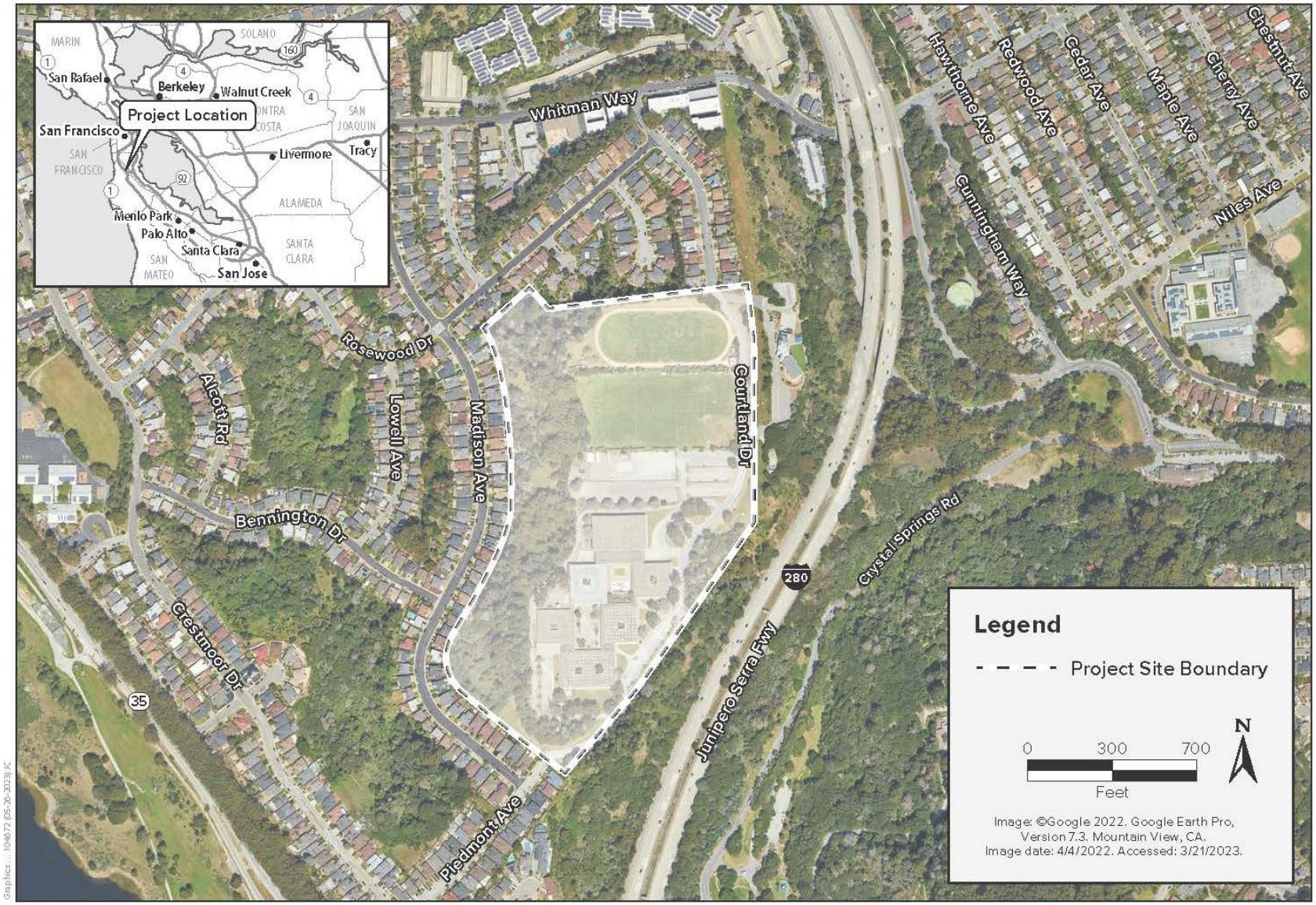


Figure 2-1. Project Location and Project Area

Existing Field Use

The San Mateo Union High School District (District) currently leases the playing fields on a short-term basis to private soccer clubs for youth soccer games and practices. The playing fields are improved with natural grass. Private soccer club members using the playing fields park in the parking lot adjacent to the fields; they also park parallel on Courtland Drive and perpendicular to Courtland Drive in unimproved dirt areas east of Courtland Drive. During winter months, the soccer clubs use portable flood lights to light portions of the playing fields to extend playing time after sunset. Use of the fields for private soccer activities varies by time of year. Schedules for two clubs, AYSO San Bruno and San Bruno Lowen 83, were reviewed for 2022, the most recent full calendar year of activity at the fields, to provide an idea of how the fields are used over a typical year.

Lowen 83 has winter, spring, summer, and fall leagues, resulting in games throughout the year. Games for Lowen 83 are on Saturdays or Sundays except in the fall, where they are generally on Sundays. Lowen 83 has a maximum of eight games in a given day but has as few as one game per day. When there are three or fewer games in a day, it is less common for games to overlap with each other. When there are four or more games, some games may overlap by starting at the same time or by starting when another game is ongoing. Other games may also be played back-to-back, so that when one game ends, another begins shortly after. The earliest games started at 9:00 a.m., and the latest games were scheduled to start at 6:30 p.m. Lowen 83 also holds practices Monday through Thursdays from 4:30 to 7:30 p.m. Exact usage of portable flood lights is not known, but presumably they would be used for these later games and practices during times of year where sunset occurs earlier in the day. For example, dusk in October in San Bruno starts shortly after 7p.m.

The AYSO spring season (roughly March through May) has about eight games total at Crestmoor, typically scheduled on Sundays. AYSO holds substantially more games in the fall (roughly September through November) on Saturdays, with 31 to 34 games per day, except for the last day of the season that had eight games. Because of the number of games played on a single day, it is common both for games to overlap and to be held back-to-back on these days. For example, on one day, seven games began at 9:00 a.m., with five games played on the upper field and two games played on the lower field. The earliest games started at 9:00 a.m., and the latest game was scheduled to start at 4:00 p.m. scheduled to end by 5:15 p.m. Other games are also played back-to-back. Practices occur throughout the week, depending on each team coach's schedule. Overall, given the AYSO fall schedule, the fall season results in far more use at the Crestmoor fields than the spring season.

Other activities outside of usual games and practices occur. For example, the San Bruno AYSO Turkey Tournament is held annually in late November, and AYSO hosts a boys and girls Area Tournament annually in early December. Other programs can also be held for a shorter time period during the year, such as an 8-week program on Monday nights.

In addition to private league activities, informal use of the fields occurs throughout the week, such as for walking, running, and other similar workouts.

2.1.3 Land Use

The *San Bruno General Plan* (City of San Bruno 2009) designates the project site as Low Density Residential, permitting a density of 2.1 to 8.0 units per acre, or 84 to 321 lots on the project site's approximately 40.2 acres. The project site is zoned R-1, Single Family Residential District. The

recreational fields are also subject to General Plan Implementing Policy OSR-8, which currently reads as follows.

> During reuse of the former Crestmoor High School site (designated for single-family residential development), preserve the existing playing fields for recreational use per direction of the General Plan Update Committee

2.2 Project Objectives

2.2.1 California Environmental Quality Act Project Objectives

Per the California Environmental Quality Act (CEQA) State Guidelines Section 15124(b), the objectives of a proposed project "should include the underlying purpose of the project and may discuss the project benefits." Importantly, the "objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary" (CEQA State Guidelines Section 15124(b)).

The project objectives, for purposes of CEQA, include the following.

1. Redevelop an underutilized site with a residential neighborhood that provides a variety of home sizes at a density that is compatible with the surrounding neighborhood.
2. Provide housing at a range of income levels (including low- and moderate-income households) that would assist the City in meeting its Regional Housing Needs Allocation (RHNA) targets.
3. Develop a project that is compatible with the existing biological setting and that provides improved management of preserved open space.
4. Provide wildland fire protection and maintenance of existing wooded areas.
5. Provide recreation fields and other public facilities and amenities to provide recreational opportunities, including providing for evening uses to maximize availability of the fields and facilities.

2.2.2 SummerHill Homes Project Objectives

In a submittal to the City (SummerHill Homes 2023), SummerHill Homes defined the following as its project objectives, which the City considered in defining the project's objectives under CEQA.

1. Provide housing at a range of income levels (including low- and moderate-income households) that would assist the City of San Bruno in meeting its RHNA targets.
2. Provide new single-family detached homes that would provide housing for families at a variety of income levels (including low- and moderate-income households) in the city.
3. Provide a variety of home sizes at a range of sales prices and at a density that is complementary with the existing surrounding neighborhood.
4. Provide a residential project that responds to market demands in the City of San Bruno.
5. Develop a project that is compatible with the existing biological setting and that provides improved management of preserved open space.

6. Provide wildland fire protection maintenance of existing wooded areas.
7. Develop enough residential units to have an economically viable and feasible project.

2.3 Project Buildout

This EIR assesses both the proposed project and a variant of the proposed project (project variant). The residential and recreational components (described herein) would be the same under both the proposed project and the project variant. The primary differences between the proposed project and the project variant would involve the amount of open space dedicated to and owned by the City versus the amount of open space retained by the homeowner's association (HOA). These differences are described in the following subsections.

2.3.1 Residential Component

The residential component of the project would include 155 homes. Figure 2-2 and Figure 2-3 show the site plans for the proposed project and project variant, respectively, but the residential component under both the proposed project and the project variant would be the same. The project would result in an effective density of 3.86 dwelling units per gross acre on the 40.2-acre project site**.** The proposed building heights for the homes would be up to 28 feet (two stories). The residential component of the project would be divided into two neighborhoods with varying lot sizes. One neighborhood would include 63 four-bedroom homes ranging from approximately 1,900 to 2,300 square feet of living space with typical lot sizes of 3,000 square feet. The second neighborhood would include 92 four-bedroom homes ranging from approximately 2,200 square feet to 2,700 square feet of living space with typical lots sizes of 2,850 and 3,375 square feet. In accordance with the City's Affordable Housing Program (AHP), the project includes 24 on-site below market rate (BMR) homes (8 at low-income level and 16 at moderate-income level) spread throughout the two neighborhoods, with 12 BMR homes in each neighborhood. Typical designs of the homes are shown in Figure 2-4.

The residential component of the project would be designed according to the 2022 California Building Standards and Fire Codes as amended by the City, which includes energy Reach Codes. The homes would be all-electric and contain solar panels, energy efficient electric appliances, energy efficient windows, and energy efficient insulation and cooling systems. Garages would also have bicycle parking.

2.3.2 Recreational and Open Space Component

The proposed project would include dedication of approximately 6.91 acres of public open space to the City, which the City would own and maintain, as shown on Figure 2-2. The City would also construct improvements within about 5.3 acres of the 6.91 acres of the dedicated open space area in the northern area of the project site, including a sports field with permanent nighttime lighting fixtures. The other 1.61 acres along Courtland Drive would be available for recreational supportive uses. Parking would be provided along Courtland Drive, within the recreational parcel, and along the northern extent of the residential ring road. The open hours for the recreational field would be 5:00 a.m. to 10:00 p.m. daily; however, actual hours of use of lighting would be subject to a rental application. The field would be striped to allow reconfiguration of fields to accommodate various sizes of fields. As of the writing of this Draft EIR, the configuration of the fields has not been

finalized. The field design could use synthetic turf or natural grass and would allow for a maximum of six soccer fields in use at any one time. Another option would include striping for up to two little league baseball fields and five soccer fields, allowing for a maximum of two little league games or five soccer games to occur at one time (Figure 2-5). Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time.

As noted above, the City also intends to develop various recreation, recreation supporting amenities, and/or parking on about 1.61 acres east of Courtland Drive (shown as Future Phase Opportunity Zones in Figure 2-5) within that 6.9 acres of public open space. The City currently has no specific recreational amenities planned for this area, but may choose at a future time to develop recreational amenities. The proposed project also would set aside approximately 12.29 acres of privately owned, publicly accessible open space. The HOA would implement a vegetation management plan within the wooded slope area to address wildfire hazards in that area. There would also be about 1.8 acres of privately owned neighborhood community spaces, which includes a tot lot and an area with a more passive design.

The project variant would include dedication of approximately 12.24 acres of land to the City for public open space (approximately 6.47 sloped acres and approximately 4.58 rough graded acres for the playing fields, and 1.19 acres for recreational supportive uses), while the private open space in the sloped wooded areas would be about 7.51 acres. The playing fields and other recreational uses would be the same as under the proposed project, except that the graded area in the dedicated open space for recreation use would be about 1.14 acres smaller than under the proposed project. A vegetation management plan would still be implemented in the portion of the wooded slope area dedicated to the City.



Figure 2-2. Residential Site Plan for Proposed Project



Figure 2-3. Residential Site Plan for Variant



Source: SummerHill Homes, February 3, 2023.

Figure 2-4. Typical Home Designs



Source: Callander Associates, October 10, 2023.

Figure 2-5. Conceptual Design Alternative for Field Design

2.3.3 Public Services and Utilities

Garbage, composting, and recycling service would be provided by Recology of San Bruno. Domestic water service would connect to existing public water mains in Piedmont Avenue and Courtland Drive. Irrigation service for the common areas maintained by the HOA would be provided through separate meters. A new regulator station would be constructed at the Piedmont Avenue point of connection.

As part of the proposed project, the project's sanitary sewer service would connect to an existing sanitary sewer main located along Courtland Drive near the northern entrance to the project site. Electric, cable, and telephone services are anticipated to connect to existing service lines along Courtland Drive. New onsite utilities would be placed underground, including those of San Bruno CityNet Services.

The proposed project would treat stormwater with low impact development measures and would include a large bioretention area at the northwest end of the project site within the public open space dedicated to the City before being discharged to an existing storm sewer main along Keefe Court. A private storm drain easement would be retained within the public open space. Stormwater treatment would be to municipal stormwater permit requirements. The HOA would maintain the bioretention area and the private storm drain line. The recreational component of the project would have its own stormwater treatment infrastructure.

The project variant would include a primary stormwater treatment basin located within a triangular-shaped 0.75-acre parcel that would be owned and maintained by the HOA. A new storm drain line would connect to the existing private line that connects to Keefe Court within a private storm drain easement through the dedicated public open space.

2.3.4 Site Access and Circulation

Vehicular circulation would be provided to the project site from Piedmont Avenue at the southern entrance and Courtland Drive at its northern entrance. Courtland Drive, a private driveway with a public access easement that would become a public right-of-way of about 2.9 acres, would be reconstructed and realigned to meet the City's design standards as part of the project. Public parking would be provided as shown in Figure 2-5 within the parcel for recreational uses, along Courtland Drive, and on the south side of the recreational parcel along the northern extent of the residential ring road.

The project's design includes a ring road that provides circulation around the perimeter of the proposed residential lots, with east–west drives throughout. Within the project neighborhoods, there would be 38-foot-wide private streets, including paving, sidewalks on both sides, and parking on one side. A public access easement would be provided along the north side on Street "A" adjacent to the dedicated open space to provide access to parking. Other private streets would provide parking only to residents and their guests.

Existing easements providing access to the church property east of Courtland Drive would be replaced with public access easements to align with the existing driveway locations. An existing easement providing the California Department of Transportation (Caltrans) with access to adjacent I-280 property would be amended or restated to reflect the new alignment of Courtland Drive. Two common area parcels along the western portion of the developed project site would provide access

for the San Bruno Fire Department to the natural open space parcel and for ongoing maintenance and site safety. Access to the San Bruno Chinese Church would be maintained and the existing cell tower would continue to be located on the church's property.

The project variant would be the same as the proposed project, except that under the project variant, Courtland Drive would be a public street parcel with no recreation-supportive improvements (as described in Section 2.3.2, *Recreational and Open Space Component*). The Courtland Drive right-of-way would instead be 2.1 acres.

2.3.5 Landscaping

Under both the proposed project and project variant, approximately 250 trees would be removed, and 315 trees would be planted.

Each home would include front-yard landscaping with decorative lattice fencing facing public views and solid-wood fencing between private lots. Yards in proximity to I-280 would include sound-attenuating wood fencing. Open-view fencing would be located along the project site's eastern property line and in rear yards abutting the 12.29-acre western private (but publicly accessible) open-space parcel. The project and project variant would include drought-tolerant and/or native landscaping, water-conserving irrigation systems including climate-sensitive controllers in common areas, and biological treatment of stormwater runoff.

The vegetation management plan also provides for ongoing vegetation removal. Eucalyptus trees may be removed from the area subject to the vegetation management plan. Stumps of removed eucalyptus may be treated with herbicides to control resprouting because they can readily resprout when cut, grazed, or burned. Monterey pines, or any other trees, that are dead or in declining health should also be considered for removal. Trees that are otherwise healthy can be selected for removal if they are deemed a fire hazard after other methods for fuel reduction (e.g., crown raising) have been considered.

Under both the proposed project and the project variant, the HOA would be responsible for maintaining all streets within the neighborhoods, (see Section 2.3.4, *Site Access and Circulation*, regarding Courtland Drive) stormwater treatment areas and infrastructure, architectural street lighting, common-area landscaping, and front-yard landscaping; the City would be responsible for maintaining the dedicated area containing the recreational facilities. Under the proposed project, the HOA would be responsible for maintaining the private and publicly accessible sloped areas, including fire-vegetation management. The HOA would also be responsible for maintaining the private stormwater treatment area within the area dedicated to the City (Figure 2-6). Under the project variant, the developer would dedicate 12.24 acres to the City, including recreation and sloped areas, retaining 7.51 acres of private open space. Maintenance of land within the dedicated area would either be by the City or, in the case of the sloped areas, the HOA as determined by the City (Figure 2-7).

2.4 Project Construction

2.4.1 Demolition and Grading

Under both the proposed project and project variant, demolition and rough grading activities for both the residential component and the recreational and open space component would be conducted concurrently. Prior to the transfer of title of land to the City, the portion of the dedicated land proposed for recreational facilities would be rough graded, and private stormwater treatment areas and storm drain lines serving the project would be constructed. Grading for the project would include approximately 64,500 cubic yards of cut and 40,500 cubic yards of fill. The excess 24,000 cubic yards of soil would be removed from the project site. Site preparation would also include remedial grading to remove disturbed soil that extends below proposed improvements and backfilling the resulting excavations with compacted engineered fill (Rockridge Geotechnical 2023). Grading would be completed consistent with recommendations in the project's geotechnical report (Rockridge Geotechnical 2023). The preliminary grading and drainage plans are shown in Figure 2-8 and Figure 2-9. Demolition is expected to take approximately 4 months; installation of utilities and rough grading would occur after demolition and would take 5 months.

2.4.2 Residential Component

Under both the proposed project and project variant, the single-family homes would be constructed in phases and would begin with fine grading. Actual construction timing would be subject to market conditions, though it is expected that the first year of total build out would be 2027. Construction hours for the residential component would be consistent with the requirements of the City's Noise Ordinance. There would be no differences in residential component project construction between the proposed project and project variant.

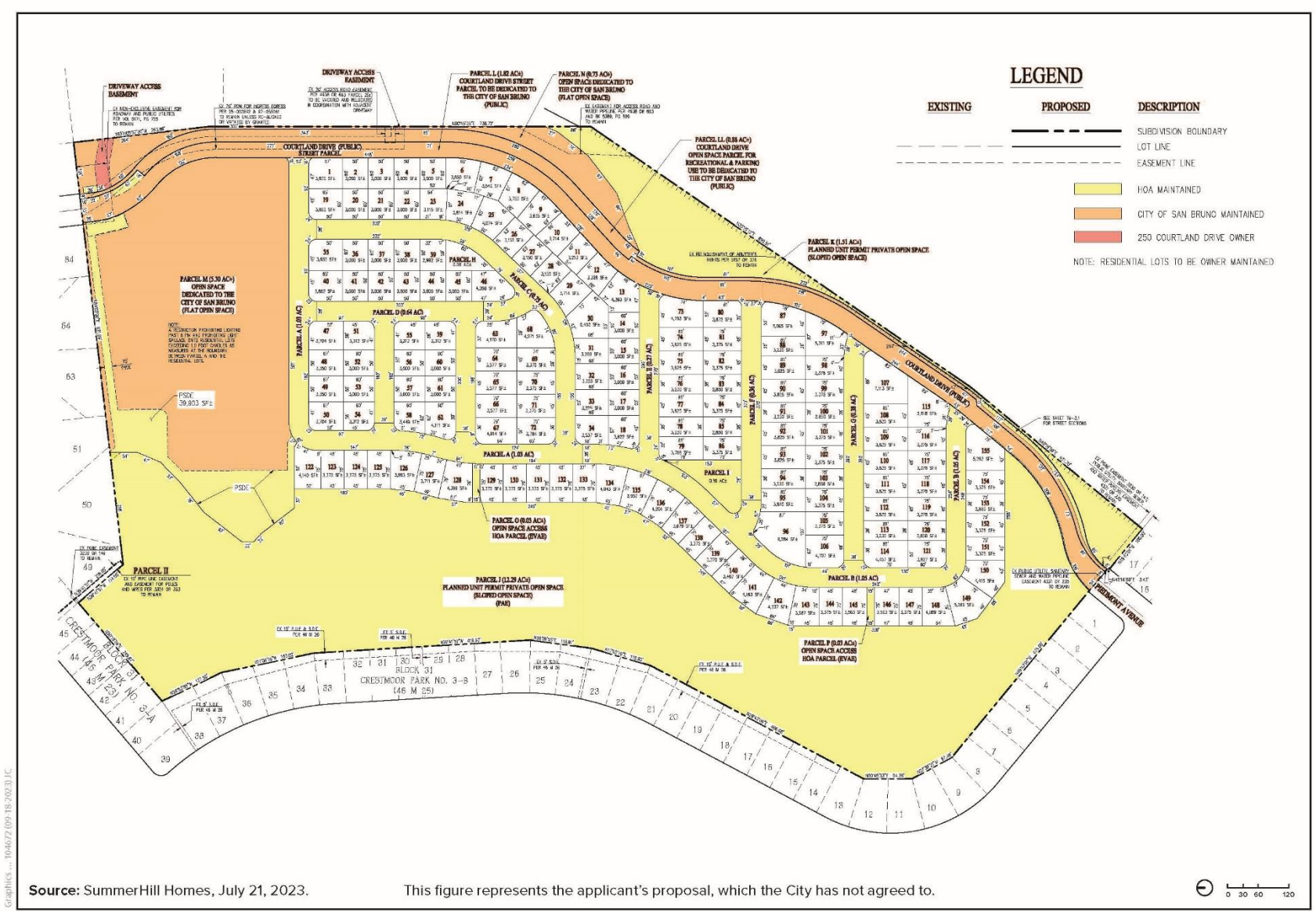


Figure 2-6. Proposed Project Maintenance Responsibility

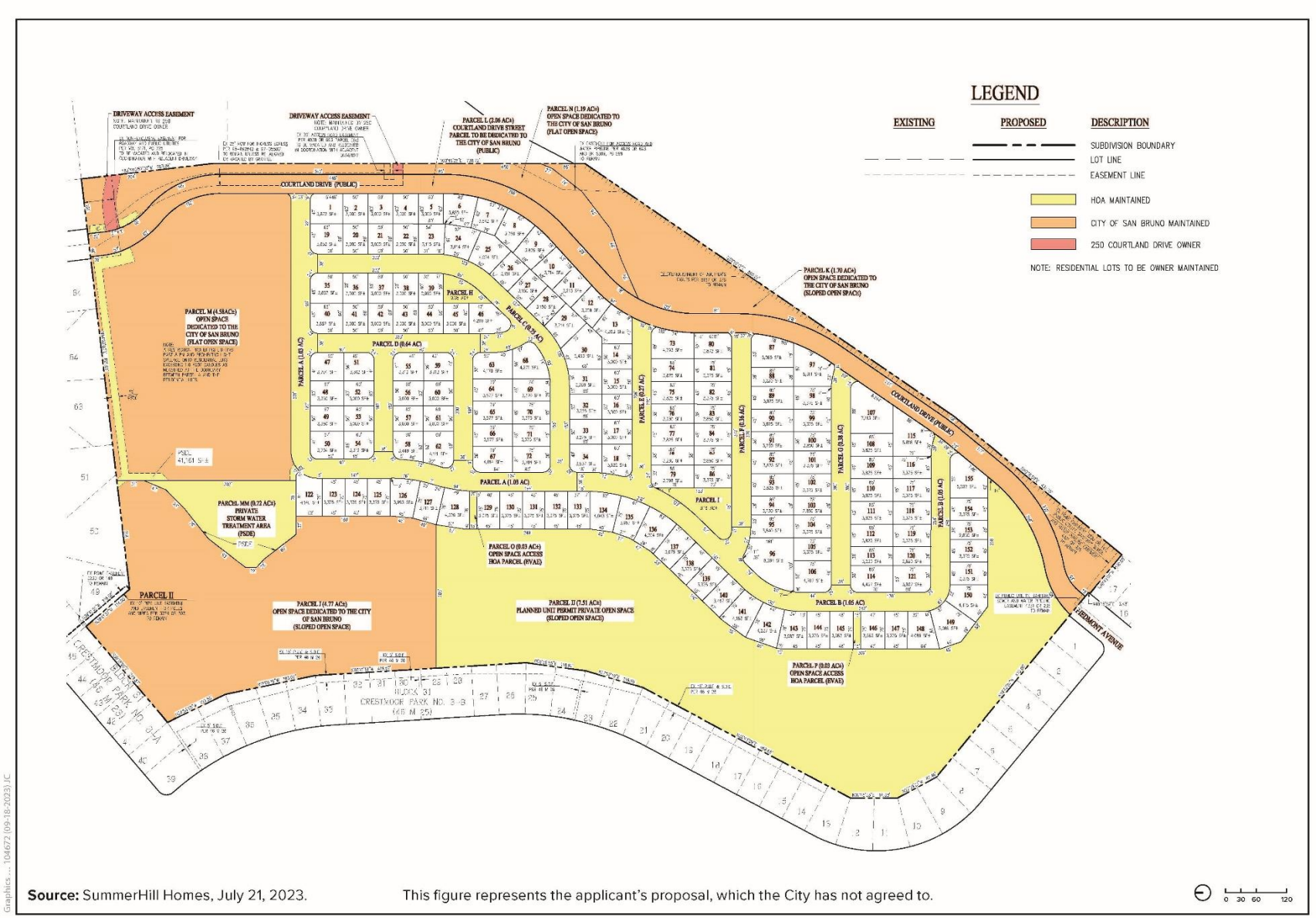


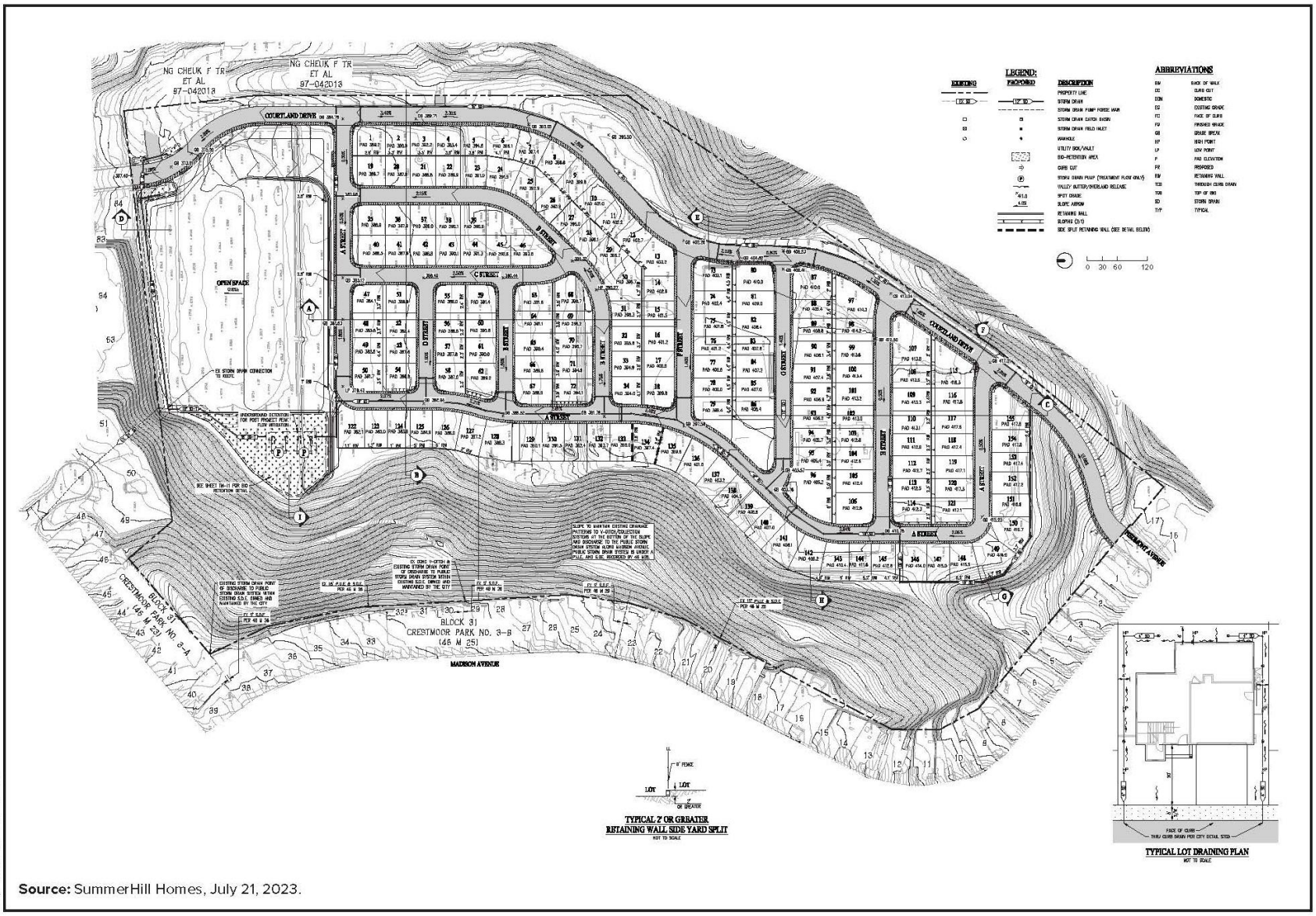
Figure 2-7. Variant Maintenance Responsibility



Source: SummerHill Homes, July 21, 2023.

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Figure 2-8. Proposed Project Preliminary Grading Plan



Source: SummerHill Homes, July 21, 2023.

Figure 2-9. Variant Preliminary Grading Plan

2.4.3 Recreational and Open Space Component

The City estimates that construction of the recreational field on the dedicated open space could take approximately 12 months. Construction hours for the recreational and open space component would be consistent with the requirements of the City's Noise Ordinance.

2.4.4 Best Management Practices to Reduce Greenhouse Gas Emissions

The Bay Area Air Quality Management District's 2022 CEQA Guidelines recommend, but does not require, implementing various best management practices (BMPs) to reduce greenhouse gas emissions from construction-related activities. SummerHill Homes has indicated that it will implement the following specific BMPs.

- Require all diesel-fueled off-road construction equipment be equipped with U.S. Environmental Protection Agency (EPA) Tier 4 Final compliant engines or better as a condition of contract, though there may be times when equipment may not be Tier 4 compliant.
- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 2 minutes (a 5-minute limit is required by the state airborne toxics control measure [Title 13, Sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the project site and develop an enforceable mechanism to monitor idling time to ensure compliance with this measure.
- Prohibit off-road diesel-powered equipment from being in the "on" position for more than 10 hours per day.
- Require all construction equipment be maintained and properly tuned in accordance with manufacturers' specifications. Equipment should be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Where grid power is available, prohibit portable diesel engines and provide electrical hookups for electric construction tools, such as saws, drills and compressors, and use electric tools whenever feasible.

2.5 Required Approvals

The following discretionary approvals would be required prior to development of the project. Some of these approvals may not be required for the variant. (Note that the General Plan Amendments are proposed by the City in connection with the proposed project, but are not proposed by the project sponsor in connection with the project variant.)

- **General Plan and Zoning Map Amendments.** In connection with the project, on December 13, 2022, the City initiated General Plan and Zoning Ordinance amendments to modify provisions contained in the *San Bruno General Plan* regarding the preservation of open space and playing fields at the project site, including but not limited to General Plan Policy OSR-8, to rescind Resolution 2022-04. This initiated General Plan Amendment as included in the proposed project (but not the project variant) includes the following:

- Amendment of Policy OSR-8 to replace the current policy with the following text: "A private development project for reuse of the Crestmoor Site shall dedicate the following areas to the City (the Dedicated Property) at the approximate locations shown in Figure 5-2 (i) approximately 5.3 acres of unimproved property located west of Courtland Drive, intended for future use primarily for soccer and playing fields; and (ii) approximately 1.61 acres of unimproved property located east of Courtland Drive intended for future use for recreation-supportive improvements, such as public parking and other improvements. Minor deviations to these locations and acreages requested by an applicant for private development to accommodate project design shall be permitted so long as the Dedicated Property can accommodate the approximate configuration shown for soccer fields and public parking as in Figure 5-2 and the Dedicated Property totals approximately 6.91 acres.
- Sloped areas on the Crestmoor Site, totaling approximately 12.29 acres, in the approximate area shown in Figure 5-2 (Open Space Area), shall be preserved in an unimproved state (subject to improvements required for safety and maintenance) and made publicly accessible for open space and recreational uses as part of any private development project proposed for the Crestmoor Site."
- Amendment of the General Plan Land Use diagram to designate the Dedicated Property (but not the Open Space Area) as Parks/Open Space, and other conforming changes to the General Plan and Zoning Map as needed to implement that changed designation and the provisions included above.

- **Planned Unit Permit (PUP).** The City allows for the clustering of residential development and relief from various development standards to preserve or create open space and to reduce development on slopes. The City administers this deviation from conventional Single-Family (R-1) zoning standards through a Planned Unit Permit (PUP) which still allows for the full overall residential density to be built on a given project site. The project sponsor is requesting a PUP to use reduced setbacks and lot sizes in order to reduce development on sloped areas and to create open space.
- **Vesting Tentative Subdivision Map.** A vesting tentative subdivision map is requested by the project sponsor to establish the project's lots (for residences, open space, and other uses), appropriate access, utility, and service easements.
- **Tree Removal Permit.** A tree removal permit would be required prior to tree removal at the project site.
- **Construction Permits.** The project would require various permits for construction, including grading and building permits.
- **Caltrans Easement.** An existing easement providing Caltrans with access to adjacent I-280 property would be replaced to reflect the new alignment of Courtland Drive.
- **Conditional Use Permit.** A conditional use permit is needed for the City to operate the recreational space as a park.
- **San Francisco Airport Land Use Commission Consistency Determination.** Pursuant to state law, when a general plan amendment and/or zoning amendment are proposed within Airport Influence Area B of an adopted Comprehensive Land Use Plan, a referral must be made to the San Francisco Airport Land Use Commission for a consistency determination. A consistency

determination from the City/County Association of Governments in its capacity as the Airport Land Use Commission will be required for the Project to be approved.

In accordance with the State Density Bonus Law, to the extent needed, the project would use waivers of development standards that have the effect of physically precluding construction of the project as proposed and/or incentives/concessions with respect to development standards, zoning requirements, architectural design requirements, or other regulatory incentives or waivers that result in identifiable and actual cost reductions to provide for affordable housing costs. Additionally, an amendment to San Bruno Municipal Code Section 12.44070 would be needed to allow for the cross sections contemplated along Courtland Drive. However, this amendment is being completed separately with other ordinance updates and would not be part of the project approvals.

Chapter 3
Impact Analysis

Chapter 3 of this Environmental Impact Report (EIR) presents an analysis of the potential impacts that the proposed project and project variant could have on existing environmental conditions. Where no specification is made as to the proposed project and the project variant's impact, the conclusion and analysis apply to both.

Organization of This Chapter

Each chapter covers a California Environmental Quality Act (CEQA) resource area topic and has the following subsections:

- **Regulatory Setting** – describes the federal, state, and local regulations regarding the impact topic that could be applicable to the construction and operation of the proposed project and project variant.
- **Environmental Setting** – describes existing baseline conditions, including the environmental context and background, to the extent needed to understand the environmental impacts of the proposed project and variant.
- **Environmental Impacts** – identifies thresholds of significance and evaluates how the proposed project and variant would affect the baseline conditions. If the change to the baseline conditions would exceed the significance thresholds, this normally will constitute a significant impact, in which case mitigation measures to reduce, eliminate, or avoid the significant impacts are recommended.

Mitigation Measures

If the Draft EIR analysis determines that a significant impact would occur, the impact is classified as significant, and mitigation measures are identified that would reduce, eliminate, or avoid the adverse effect. Mitigation measures identified in this Draft EIR were developed in accordance with State CEQA Guidelines Section 15126.4(a)(1)(A), which states:

> The discussion of mitigation measures shall distinguish between measures that are proposed by the project proponents to be included in the project and other measures proposed by the lead, responsible, or trustee agency or other persons that are not included but the agency determines could reasonably be expected to reduce adverse impacts if required as conditions of approving the project. This discussion shall identify mitigation measures for each significant environmental effect identified in the EIR.

In this Draft EIR, mitigation measures are provided immediately following each identified significant impact and are labeled with both a number and a code corresponding to the topic that is addressed (e.g., "AQ-1" for Air Quality Mitigation Measure 1). An impact may have more than one mitigation measure, and a mitigation measure may apply to more than one impact.

Classification of Impacts

In accordance with Section 15022(a) of the State CEQA Guidelines, the City of San Bruno (City) bases the impact significance criteria on the State CEQA Guidelines (Appendix G) to evaluate the proposed project and project variant impacts throughout this document. These criteria are listed at the beginning of the *Environmental Impacts* sections under *Thresholds of Significance* throughout this chapter. For each impact identified, a level of significance is determined using the following classifications:

- No Impact (NI) denotes situations in which there is no adverse effect on the environment.
- Less than Significant (LTS) denotes effects that may have a noticeable impact, but do not exceed established or defined thresholds or might exceed such thresholds except for aspects of the project as proposed that the EIR assumes will be implemented.
- Significant (S) denotes effects that may have a significant impact before mitigation (meaning exceeding established or defined thresholds). The analysis in these instances conservatively assesses the credible worst-case conditions, but the discussion acknowledges that there may be some uncertainty regarding the credible extent of the impact.
- Less than Significant with Mitigation (LTSM) denotes potentially significant effects that would be mitigated to a less-than-significant level with the implementation of feasible mitigation measures.
- Significant and Unavoidable (SU) denotes effects that would remain significant after implementation of mitigation measures.

In Chapter 3, impacts are defined using an alphanumeric system that identifies the environmental topic of the impact. For example, NOI-1 denotes the presentation of the first impact in the Noise section. The abbreviated codes used to identify the environmental issues discussed in this chapter are listed below.

- AES – Aesthetics
- AQ – Air Quality
- BIO – Biological Resources
- CUL – Cultural
- EN – Energy
- GEO – Geology and Soils
- GHG – Greenhouse Gas Emissions
- HAZ – Hazards and Hazardous Materials
- HWQ – Hydrology and Water Quality
- LU – Land Use and Planning
- NOI – Noise and Vibration
- PH – Population and Housing
- PS – Public Services
- REC – Recreation
- TRA – Transportation
- TCR– Tribal Cultural Resources
- UT – Utilities and Service Systems
- WILD – Wildfire

Approach to Analysis of Residential Component and Recreational Component

The attributes and characteristics of the residential component of the proposed project are well defined. As a result, this EIR contains a project-level impact analysis of the residential component of the proposed project. As described in Chapter 2, *Project Description*, although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other users would use the facilities in the future. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time. Consistent with State CEQA Guidelines Sections 15144 and 15145 regarding forecasting and speculation, the EIR therefore evaluates the maximum reasonably foreseeable use that can be identified, without speculation, for the recreational component.

Impacts Requiring No Further Analysis

Section 15128 of the State CEQA Guidelines states, "An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR." During the scoping process for this Draft EIR, the City determined that implementation of the proposed project and project variant would not result in significant environmental impacts on: Agriculture and Forestry Resources, and on Mineral Resources. Therefore, these issues are not discussed in detail in this Draft EIR. The following discussion describes the basis for the City's determination with regard to each of these topics.

Agriculture and Forestry Resources

The project site is located in a developed portion of San Mateo County, which is classified as "Urban and Built-Up Land" by the California State Department of Conservation (DOC 2019). There is no designated important farmland (including Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Important) within or adjacent to the project site (DOC 2019). There is no grazing land within or adjacent to the project site. The project site does not contain Williamson Act land or other land zoned for agricultural uses (DOC 2023a). For the reasons stated above, the project would have **no impact** on farmland or agricultural resources.

California Public Resources Code (PRC) Section 12220(g) defines forest land as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, visual resources, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. The project site is in an urban environment and has been developed. None of the landscaped areas on the project site support 10 percent native tree cover under natural conditions that would allow for the management of the forest resources included in the PRC definition of "forest land." Mixed pine eucalyptus forest is located along the margins of the project area, primarily on slopes, and is dominated by an overstory

of Monterey pine (*Pinus radiata*) and red gum (*Eucalyptus camaldulensis*); red gum is nonnative. Therefore, the project would have **no impact** on forestry resources.

Mineral Resources

The project site is located in a developed urbanized portion of San Bruno that has been disturbed by development. The project site is not located within a City-designated Mineral Resource Zone (DOC 2023b). The project site is not located in an area classified by the California Geologic Survey as having significant mineral deposits (DOC 2023b).For the reasons stated above, the project would not result in the loss of availability of a known mineral resource nor of a locally important mineral recovery site, and **no impact** would occur.

3.1 Aesthetics

This section evaluates the project's potential environmental impacts on aesthetics and visual resources. It first describes the existing visual character of the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.1.1 Existing Conditions

Regulatory Setting

State

California Scenic Highways Program

The California Scenic Highways Program was created by the California Scenic Highway Law in 1963 to preserve and protect scenic highway corridors from any change that would diminish the aesthetic value of lands adjacent to highways. Legislation views scenic highways as "…a vital part of the all-encompassing effort…to protect and enhance California's beauty, amenity and quality of life." The State Scenic Highway System includes a list of highways that are either eligible for designation as a scenic highway or have been so designated. These highways are identified in Section 263 of the State Streets and Highways Code. The status of a State Scenic Highway can be changed from eligible to officially designated when a jurisdiction adopts a scenic corridor protection program, applies to the California Department of Transportation (Caltrans) for scenic highway approval, and receives notification from Caltrans that the highway has been designated as a scenic highway. The state laws governing the Scenic Highway Program are found in Sections 260 through 263 of the Streets and Highways Code.

The portion of Interstate (I-) 280 between the northern San Bruno city limit (to the north) and the Santa Clara County line (to the south) is designated by Caltrans as a State Scenic Highway (Caltrans 2019). Most of the San Bruno segment of the I-280 is lined with a mix of deciduous and evergreen screening trees, allowing for distant partial views of the San Francisco Bay and San Francisco International Airport to the east. The project site is not visible from I-280 due to existing topography and vegetation.

Local

San Bruno General Plan

The San Bruno General Plan (City of San Bruno 2009), adopted in 2009, establishes a vision and action plan for the city's long-term development. The General Plan's Land Use and Urban Design, Environmental Resources and Conservation, and Transportation elements contain policies relevant to visual resources, including the following, organized by element, that are relevant to this analysis.

- **ERC-2.** Preserve as open space those portions of property which have significant value to the public as scenic resources, aesthetic, or recreation purposes.

- **LUD-E.** Ensure that new development, especially in residential neighborhoods, is sensitive to existing uses, and is of the highest quality design and construction.
- **LUD-1.** Promote development of single-family housing on former school sites owned by public school districts. Retain existing recreation facilities for resident use, whenever possible
- **T-26.** Continue to limit widening, modification, or realignment of the City's scenic corridors, consistent with Ordinance 1284. Preserve large trees and other natural features, limit signage, maintain wide setbacks, and reduce traffic speeds along these roadways.
- **T-27.** Continue to support beautification efforts along Interstate 280, an officially designated State Scenic Highway.
- **T-28.** Recognize and protect the following as local scenic corridors:
    - Skyline Boulevard, State Scenic Highway
    - Crystal Springs Road, County Scenic Road
    - Sharp Park Road, County Scenic Road
    - Sneath Lane
- **T-32.** Encourage design of public and private development to frame vistas of the Downtown, public buildings, parks, and natural features.

Land Use and Urban Design Element

The Land Use and Urban Design Element includes policies regarding urban design standards and views. It highlights the views of San Bruno Mountain, Sweeney Ridge, and associated ridgelines, as well as the California coast, as valued contributors to San Bruno's character. However, neither the General Plan nor the City has officially designated scenic vistas, and instead include *scenic corridors.* Policies seek to ensure that new development is of the highest quality design and construction, especially development in highly visible locations per General Plan Figure 2-3. The project site is visible from at least one site according to Figure 2-3; however, it is not visible from all sites. Therefore, there are no highly visible locations within the project site or near enough to the project site to be subject to these policies.

Transportation Element

The Transportation Element contains policies for five scenic corridors: I-280 (T-27), and Skyline Boulevard, Crystal Springs Road, Sharp Park Road, and Sneath Lane (T-28). I-280 is adjacent to the project site, and Crystal Springs Road is near the project site across from I-280. Both are the only scenic corridors close to the project site. The project site is not visible from I-280 or from Crystal Springs Road. Policies address conservation of the scenic corridors through coordination with Caltrans and the County of San Mateo, limiting modifications to the scenic corridors, preserving large trees and other features, and supporting beautification along I-280.

City of San Bruno Municipal Code Heritage Trees Ordinance

Chapter 8.25 of the San Bruno Municipal Code, referred to as the Heritage Trees Ordinance, establishes regulations for the removal of heritage trees on private property within the city in order to retain as many trees as possible, consistent with the reasonable economic enjoyment of private property. These regulations were put in place in part for the purposes of preserving the scenic

beauty and visual resource values of the community. The Heritage Trees Ordinance specifies that property owners who wish to remove or prune one or more heritage trees must apply for a permit to do so. Heritage trees are defined as any of the following.

- Any native bay (*Umbellularia californica*), buckeye (*Aesculus* species), oak (*Quercus* species), redwood (*Sequoia sempervirens*), or pine (*Pinus radiata*) tree that has a diameter of 6 inches or more measured at 54 inches above natural grade.
- Any tree or stand of trees designated by resolution of the City Council to be of special historical value or of significant community benefit.
- A stand of trees, the nature of which makes each dependent on the others for survival.
- Any other tree with a trunk diameter of 10 inches or more, measured at 54 inches above natural grade.

City of San Bruno Zoning Ordinance

The San Bruno Zoning Ordinance found in the San Bruno Municipal Code Chapter 12.72 - 12.300 controls development factors that influence the visual character of a site, including building height, bulk, setback, lot coverage, and landscaping.

Environmental Setting

Scope of Visual Resources

Visual resources addressed in this analysis include natural and constructed features contributing to the aesthetic quality of the landscape's appearance that can be seen from a public viewpoint. Scenic resources can include natural open space, interesting topographic formations, and intact natural vistas. Natural landforms and landscapes, such as hills or mountains, native woodlands, lakes, streams, and coastlines, are often considered to be scenic resources. Scenic resources also can include urban open spaces, urban forests, and the built environment. Examples of these include public parks, public open space, nature centers, and preserves. Historic resources and distinctive architectural features can also be important to community aesthetics.

Project Site

Visual Character and Quality

Visual character is determined based on the dominant land use and visual elements of the area. *Visual quality* is the overall visual impression or attractiveness of an area as determined by the particular landscape characteristics, including landforms, rock forms, water features, and vegetation patterns. The project site is surrounded by roadways: Madison Avenue to the west, Rosewood Drive to the north, I-280 and Courtland Drive to the east, and Piedmont Avenue to the south. I-280 is designated by Caltrans as a State Scenic Highway and is lined with tall, shady trees with partial views of San Francisco to the north and San Francisco Bay to the east. Note, however, that views of San Francisco to the north and San Francisco Bay to the east are in a different direction of views from I-280 in the direction of the project site to the west. Southeast of the project site, across from I-280, Crystal Springs Road runs, and is designated by the San Mateo County General Plan as a County Scenic Road.

The visual character of the project site is defined by the structures on site as well as the visible surrounding uses. Currently, the project site contains the former Crestmoor High School, along with playing fields, parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. There is no current use of the school facility; however, the recreational fields are currently utilized by local sport leagues. The sloped areas on the west side of the campus have been minimally maintained and are densely wooded, dominated by Monterey pine and red gum eucalyptus trees with a dense shrub layer. Based on the arborist report, the project site contains trees with heritage status (HortScience | Bartlett Consulting 2022). Existing single-family subdivisions neighbor the project site to the north, west, and south across substantial grade changes, with a wooded hillside buffer. Within the existing developed area, the project site rises approximately 44 feet from north to south.

The aesthetic quality of a view is dependent on the visual resources present and the composition of the view. The Federal Highway Administration (FHWA) *Visual Impact Assessment for Highway Projects* (FHWA 1988) has been commonly used to assess the potential aesthetic impacts of various types of development projects on public and private lands within a variety of different landscapes, including natural, rural, suburban, and urban settings. The FHWA has more recently revised its guidelines for visual impact assessment (FHWA 2015) to allow different levels of documentation to be more readily understood and practical in its application. However, the more-recent FHWA guidelines focus more on transportation projects. Although the new FHWA guidelines incorporate many elements from the FHWA 1988 guidelines, the earlier guidelines remain most applicable for assessing aesthetic impacts of proposed projects within diverse landscape types and on private lands. Therefore, due to the nature and setting of this proposed project, the methodology for this aesthetic impact assessment relies primarily on the process, concepts, and terminology outlined in the earlier (1988) guidelines. Aesthetic quality according to the 1988 FHWA guidelines is described in terms of vividness, intactness, and unity.

- *Vividness.* The extent to which the landscape is memorable, which is associated with the distinctiveness, diversity, and contrast of visual elements.
- *Intactness.* The integrity of visual order in the landscape and the extent to which the existing landscape is free from atypical visual intrusions (i.e., an element that appears out of place with the visual order).
- *Unity.* The extent to which visual intrusions are sensitive to and in visual harmony with the existing landscape.

The project site has a low vividness. The existing structures and athletic fields appear well maintained from the outside, and the athletic fields are routinely landscaped; however, the infrequent use of the site has led to natural degradation over time. Neither the school site nor the athletic fields are inherently memorable because they lack distinctiveness, diversity, or contrast in comparison to surrounding structures, such as single-family residences and the nearby religious facility. The project site's existing conditions are in visual harmony with the landscape and surrounding structures although the site may include atypical visual intrusions; therefore, there is moderate unity and moderate intactness. Representative photographs showing visual conditions at the project site and immediate surrounding areas are provided in Figures 3.1-1, 3.1-2, and 3.1-3.



Figure 3.1-1. KOP-01: Piedmont Avenue, Existing Conditions and Visual Simulations – Night



Figure 3.1-2. KOP-02: Jenevein Avenue, Existing Conditions and Visual Simulations – Night



Figure 3.1-3. KOP-03: Crestmoor Drive, Existing Conditions and Visual Simulations – Night

Scenic Corridors and Vistas

The nearest designated scenic corridor to the project site is I-280, which is approximately 0.15 mile to the east. Crystal Springs Road is approximately 0.31 mile to the southeast. However, there are no designated scenic vistas or scenic corridors or vistas within the project site boundaries.

Light and Glare

Luminance Fundamentals

The following common luminance terms are defined to provide context and a better understanding of the technical terms referenced throughout this section.

- *Light trespass*. Light trespass, also commonly referred to as light spill, results from light emitted from an installation that falls outside the boundaries of the property on which the lighting system is installed. Light trespass is measured on both the vertical plane (e.g., light shining above the ground) and horizontal plane (e.g., light shining on the ground) (NLPIP 2003).
- *Obtrusive light.* Spill light that causes discomfort, distraction, or a reduction in the ability to see essential information, such as traffic signals.
- *Glare*. The discomfort or impairment of vision experienced when the image is excessively bright in relation to the general surroundings.
- *Sky glow*. The diffuse brightening of the night sky.
- *Illuminance*: The quantity of incident light on a plane surface, commonly measured in terms of foot-candles.
- *Foot-candle* (fc). A foot-candle is a measurement of light intensity. One foot-candle is defined as enough light to saturate a 1-square-foot area with 1 lumen of light. Table 3.1-1 includes recommended foot-candle levels for common applications established by the Illuminating Engineering Society of North America (IESNA).
- *Candela*: A candela is a measurement of luminous intensity.

Existing Light, Sky Glow, and Glare Conditions

Existing light sources include night lighting in addition to security lights that remain illuminated through the night, and temporary lighting used for athletic events. Glass and reflective surfaces on buildings and vehicles, on streets, and in parking lots contribute to a limited amount of glare that is typical of a school site. Light sources adjacent to the project site include exterior lighting from adjoining residential properties along Courtland Drive, Madison Avenue, Glenbrook Lane, and Rosewood Drive. Existing nighttime conditions can be seen on Figures 3.1-1, 3.1-2, and 3.1-3, which shows residential light sources as viewed from Crestmoor Drive, Piedmont Avenue, and Jenevein Avenue. Artificial light creates a low level of sky glow around the project site typical of urbanized areas.

Sensitive Receptors

Viewer sensitivity represents the reaction of a viewer to a landscape change in the project area. For the purposes of this analysis, viewer groups include residents in public areas of neighborhoods adjacent to the project site, and sports leagues and others utilizing the play fields. Views from

private properties are important to their residents. However, this EIR limits the scope of sensitive receptors to those experiencing views from public places, such as neighborhood streets, public parks, or public trails. This is supported by the focus of several aesthetics-related implementing polices in the City's General Plan on preserving and framing public views and scenic resources that are important to the public, such as Implementing Policies T-32, T-28, ERC-2, T-26, and T-27. With this in mind, sensitive viewers for purposes of this discussion are individuals with a direct view of the project site from a public vantage point, such as area residents, but include others traveling on local public roadways and sidewalks. The typical daytime viewers within the project area also include residents and those participating with sport leagues or individually in recreational activities on the project site.

Sensitive receptors include residents in the area who are experiencing public views (e.g., on sidewalks and roadways or in parks). Residents tend to have higher sensitivity to visual changes, because they spend more time in the area and are accustomed to the existing views, in some cases for many years. Although those working and commuting in the area may look for local landmarks and scenery, they typically are less sensitive to visual changes than residents because they are not focused on the aesthetic quality of their neighborhood. Nighttime views within the project area are also of particular importance to surrounding neighborhood residents and the broader San Bruno community. The typical nighttime viewers within the project area include residents using public roads, sidewalks, and other public areas, and therefore residents should be considered sensitive receptors when in public areas. Residents in the area tend to have high sensitivity to changes in luminance, because they are accustomed to the existing night sky views and changes in night lighting that have occurred over their time living in the area. Although those working and participating in nighttime activities in the area may look for views of the night sky, they typically are less sensitive to changes in luminance than residents, because their expectation includes the lighting necessary for nighttime activities that typically occur on the project site.

3.1.2 Environmental Impacts

Methods for Analysis

Scenic Vistas and Visual Character and Quality

Impacts related to the proposed project were determined through a professionally accepted practice that considers three primary factors.

- The existing scenic quality of an area.
- The level of viewer exposure and concern regarding visual change.
- The level of visual change caused by a project as seen by a given viewer group.

Light and Glare

A quantitative valuation of light and glare is included in this evaluation and is based on standards developed by IESNA. The City of San Bruno has not adopted quantitative light standards. The IESNA Lighting Handbook ranks geographic areas by the amount and intensity of existing light sources, referred to as *environmental zones*. The environmental zones range from E0 (protected and most sensitive) to E4 (urban and least sensitive). Areas that are more rural in character and exhibit few existing sources of light are more susceptible to impacts resulting from the installation of new

lighting sources. By contrast, urbanized areas have many existing lighting sources and are, therefore, less susceptible to adverse impacts associated with new lighting sources. Table 3.1-1 includes the environmental zones established by IESNA (ILP 2021).

Table 3.1-1. Environmental Zones

Zone	Character of Surrounding Area	Lighting Environment	Examples
E0	Protected	Dark	Astronomical observable dark skies
E1	Natural	Dark	Relatively uninhabited rural areas
E2	Rural	Low brightness	Sparsely inhabited rural areas or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements
E4	Urban	High district brightness	Town/City centers with high levels of nighttime activity

Source: ILP 2021.

The project site and immediate vicinity would be categorized in the E3 Suburban lighting zone due to the adjacent residences with a lighting context consistent of a suburban area, and is a medium district brightness. Requirements of this zone before 10:00 p.m. include less than 2.0 fc, a building façade luminance of 10 candelas per square meter, and less than 10,000 candela of illumination. These standards provide a reference value for light impacts and are used in this analysis as part of the determination of whether nighttime lighting and glare would be significant under CEQA.

Nighttime Illumination Visual Simulations

The qualitative portion of the evaluation is supported by visual simulations for the light and glare analysis. A multistep process was employed to prepare nighttime visual simulations for the project. Digital photography was captured from key observation points (KOPs) verified by the use of Global Positioning System (GPS) location support data. The KOPs were chosen to demonstrate the greatest change in nighttime conditions from publicly accessible places after evaluating several options for viewpoints for visual simulations. KOPs chosen are not related to the View Points used in Figure 2-3 of the General Plan Land Use Element, for reasons previously explained. A standard digital 35 millimeter camera was utilized consistently throughout the process, resulting in what is referred to as a "normal" view, i.e., typical of what is perceived by the human eye. A normal view allows for viewing of the three-dimensional (3D) model under similar circumstances to the proposed project physically viewed in the field.

The digital photography, along with the corresponding GPS support data, was referenced in real-world scale to 3D Computer Aided Design (CAD) platforms (i.e., 3D Studio and AutoCAD). To ensure a high degree of visual accuracy in the simulations, CAD allows for life-size modeling within the computer. This translates to using real-world scale and dimension to locate and portray facilities/structures and terrain features. Other data used to verify simulation precision include aerial photography and Google Earth topographical data.

To verify proposed structure location, elevation, and orientation, Google Earth topographical and aerial photography data were initially employed as background reference files. The 3D Studio massing models of the proposed structures were constructed based upon AutoCAD data provided by

Musco (who provided potential lighting design) that reflects a potential lighting design for the recreational component of the proposed project and variant. Camera positions and orientations were also recorded in the same 3D coordinate space, according to the GPS location data and aerial photography. Completing these stages of the process, the 3D Studio massing models of the proposed structures, and the camera locations now exist together in real-world scale with respect to distance, elevation, and orientation.

To generate the correct view relative to the digital photographs, an electronic camera lens, matching the physical lens from the field, was set up at its appropriate position in 3D coordinate space, again verified by the GPS location support data. Next, the digital photography was imported into the 3D database and loaded as an environment map, generating the digital camera view of the 3D model.

The 3D massing models of the proposed structures were displayed, along with any major existing structures, so that proper alignment, scale, angle, and distance could be verified. To complete the process, materials and texture mapping were applied to the 3D models. Then, a reality-based lighting solution was generated, based on engineering data of the lighting provided by Musco. To achieve this, physically based, photometric light sources were placed within the 3D model to represent each fixture. Light source characteristics were then matched, according to the engineering lighting data, including light fixture type, light power, temperature/color, and angle. Finally, the visual simulation was generated with a physically based rendering engine, using a multithreaded image processing algorithm commonly known as Ray Tracing. The nighttime illumination visual simulations are shown on Figures 3.1-1, 3.1-2, and 3.1-3

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant impact if it would result in any of the following conditions.

- Impact AES-1: A substantial adverse impact on a scenic vista.
- Impact AES-2: Substantial damage to scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.
- Impact AES-3: In nonurbanized areas, substantial degradation of the existing visual character or quality of public views of the site and its surroundings. In urbanized areas, conflict with applicable zoning or other regulations governing scenic quality.
- Impact AES-4: Introduction of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

Impacts

Impact AES-1: Would the project have a substantial adverse impact on a scenic vista? (Less than Significant)

There are no officially designed scenic vistas within the City of San Bruno. The city includes scenic corridors as designated by the General Plan: Crystal Springs Road is approximately 0.3 mile away, and I-280 is 0.15 mile away. Due to the topography of the site, neither scenic corridor provides views of the project site. Buildings associated with the residential component would be a maximum of 28 feet tall and therefore would not be visible from Crystal Springs Road or I-280. The topography surrounding the project site keeps it from being visible from Crystal Springs Road or I-280,

generally. The exception to this is the proposed field lighting, which is discussed under Impact AES-4 below. According to a viewshed analysis using Google Earth Pro, the sports field light standards would be visible from a small portion of I-280, northeast of the project site. There are other light standards visible in this area, responsible for skyglow in the area, and the tops of existing buildings are visible. The standards would be visible for only a short time period to motorists traveling at freeway speeds on I-280. Therefore, this would not constitute a substantial adverse impact on a scenic corridor. Trees surrounding the San Bruno Chinese Church block visibility of the light standards at other portions of I-280; these trees would not be impacted by the proposed project or variant. Therefore, none of the scenic corridors indicated in the San Bruno General Plan would be substantially adversely affected by development occurring in the project site. The proposed project and variant would be on the same project site and have the same tall components (i.e., light standards). Therefore, the proposed project and variant would have a **less-than-significant** impact on scenic vistas during construction and operation.

Impact AES-2: Would the project substantially damage scenic resources within a state scenic highway? (Less than Significant)

The project would not substantially damage scenic resources including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway. The closest State Scenic Highway, as designated by Caltrans, is I-280, which is the nearest state scenic highway just east of the project site. However, the segment of I-280 adjacent to the project site is at a different and lower elevation and is screened by vegetation and therefore does not provide views of the project site. Buildings associated with the residential component would be a maximum of 28 feet tall and therefore would not be visible from I-280. According to a viewshed analysis using Google Earth Pro, the sports field light standards would be visible from a small portion of I-280, northeast of the project site, although this visibility would be minimal in nature. There are other light standards visible in this area, as well as the tops of existing buildings. The standards would also be visible for only a short time period to motorists traveling at freeway speeds on I-280. The lights would be turned off by 10 p.m. when in use, and there is existing substantial lighting visible in the area to the east of I-280. Therefore, this would not result in substantial damage to visual resources along a scenic highway. The proposed project and variant would have the same taller components (i.e., light standards) and therefore would have similar impacts. The proposed project and variant would have a **less-than-significant** impact related to scenic resources within a State Scenic Highway during construction and operation.

Impact AES-3: In nonurbanized areas, would the project degrade the existing visual character or quality of public views of the site and its surroundings; in urbanized areas, would the project conflict with zoning or other regulations governing scenic quality? (Less than Significant)

State CEQA Guidelines Section 15387 defines an urbanized area as a "central city or a group of contiguous cities with a population of 50,000 or more, together with adjacent densely populated areas having a population density of at least 1,000 persons per square mile." The City of San Bruno has under 50,000 residents as of the 2020 census; however, the population per square mile recorded in 2020 was approximately 8,000 residents (USCB 2023a). Cities surrounding San Bruno

include South San Francisco and Millbrae, which have 63,602 and 23,216 residents, respectively (USCB 2023b, 2023c). Therefore, the project site is located in an urbanized area.

Construction

Project construction would involve clearing and grading in areas where proposed structures and recreation areas would be built and would also involve demolition of the existing buildings on site. Construction activities would add unnatural elements to views that would contrast with existing onsite natural elements; however, construction activities would be temporary and last upwards of approximately 2 years (depending on market conditions), and active construction areas would only be visible for a short period of time to the limited viewers who are, for example, traveling on Courtland Drive (when it is open) or recreating on the field site (if it is open during construction). Construction activities would be the same under the proposed project or project variant. Under both the proposed project and project variant, demolition and rough grading activities for both the residential component and the recreational and open space component would be conducted concurrently. These activities would also only be visible to a limited number of viewers at the project site because current visitors to the site include recreationists and those passing through the site on foot or by car en route to other locations. Demolition of the existing school site does not conflict and regulations governing scenic quality; the school also is not considered an historical resource under CEQA (see Section 3.4, *Cultural Resources)* so that its demolition also has no aesthetic impact on historical resources. Additionally, recreationists would not be present once the recreational fields are under construction. Construction activities under the proposed project and project variant would have the same appearance. As a result, any reduction of visual quality due to construction as result of the proposed project or project variant would be **less than significant.**

Operation

The proposed project's and variant's residential development and recreational field would be visually consistent with the existing visual character of the site surroundings and would not substantially alter the visual character of the project area. The proposed project and project variant would be consistent with the City of San Bruno Residential Design Guidelines, which were set in place to enhance residential neighborhood identity and compatibility with existing structures (City of San Bruno 2010). The project is located within the Crestmoor neighborhood planning area and the single-family homes added under the proposed project and project variant would be consistent with the existing architectural integrity of the surrounding neighborhood. The current zoning district in the project site is Single Family Residential District (R-1), which is meant to support low-density residential uses and uses related to single-family residences, such as schools, places of worship, and childcare centers. The maximum lot coverage permitted by all structures is 80 percent, and minimum site area permitted is 5,000 square feet, both of which are fulfilled by the proposed project and project variant. The residential component of the project is divided into two neighborhoods with varying lot sizes. One neighborhood would include homes ranging in size from approximately 1,900 to 2,300 square feet of living space with typical lot sizes of 3,000 square feet. The second neighborhood would include homes ranging in size from approximately 2,200 to 2,700 square feet of living space with typical lots sizes of 2,850 and 3,375 square feet. The R-1 zoning code (Section 12.96.060) specifies a maximum building height of 28 feet. Therefore, the project and project variant would have a **less-than-significant** impact related to visual character and quality or conflicting with zoning or other regulations.

Impact AES-4: Would the project introduce a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area? (Less than Significant)

Construction

During project construction, for either the Project or the variant, glare would be produced from sources such as reflective surfaces of construction vehicles. These sources would be temporary during construction vehicle use. Glare would depend on the time of day and would be transient and distributed as vehicles move through the project site. Glare is not expected to be substantial during the construction period and would largely be visible only to those close to the source due to the small area of glare (e.g., vehicle windows). Low-level temporary safety lighting may be needed for construction site security at night and in evening hours, though it is not anticipated that construction activities would occur at night. The use of safety lighting would be temporary and minimal. Any safety lighting would be low to the ground and directed toward specific areas and, therefore, shielded from nearby viewers and would not create light spillover into neighboring areas. As a result, temporary construction glare and nighttime lighting impacts due to the proposed project and variant would be **less than significant.**

Operation

The proposed project and variant would add exterior and interior lighting throughout the project site, such as streetlights and light emanating from homes, typical of residential development. The project would use nonreflective building materials to minimize glare and obtrusiveness. Interior and exterior lighting and any glare caused by the reflective nature of windows of homes would be consistent with the surrounding residential area and broader region and therefore would not constitute a substantial source of light or glare in comparison to existing conditions.

The proposed project and project variant would both install new permanent lighting at the recreation field for nighttime athletic activities, including soccer and baseball games. The physical features and use restrictions associated with the proposed field lighting are summarized in Table 3.1-2.

Table 3.1-2. Proposed Permanent Lighting Characteristics

Feature	Details
Field Lighting	Field lights: Five approximately 80-foot-tall lights and one approximately 70-foot-tall light.
Use Restrictions	Evening athletic games and evening athletic practices. Use of lighting for athletic practices and games would end at 10:00 p.m., consistent with open hours of San Bruno parks.

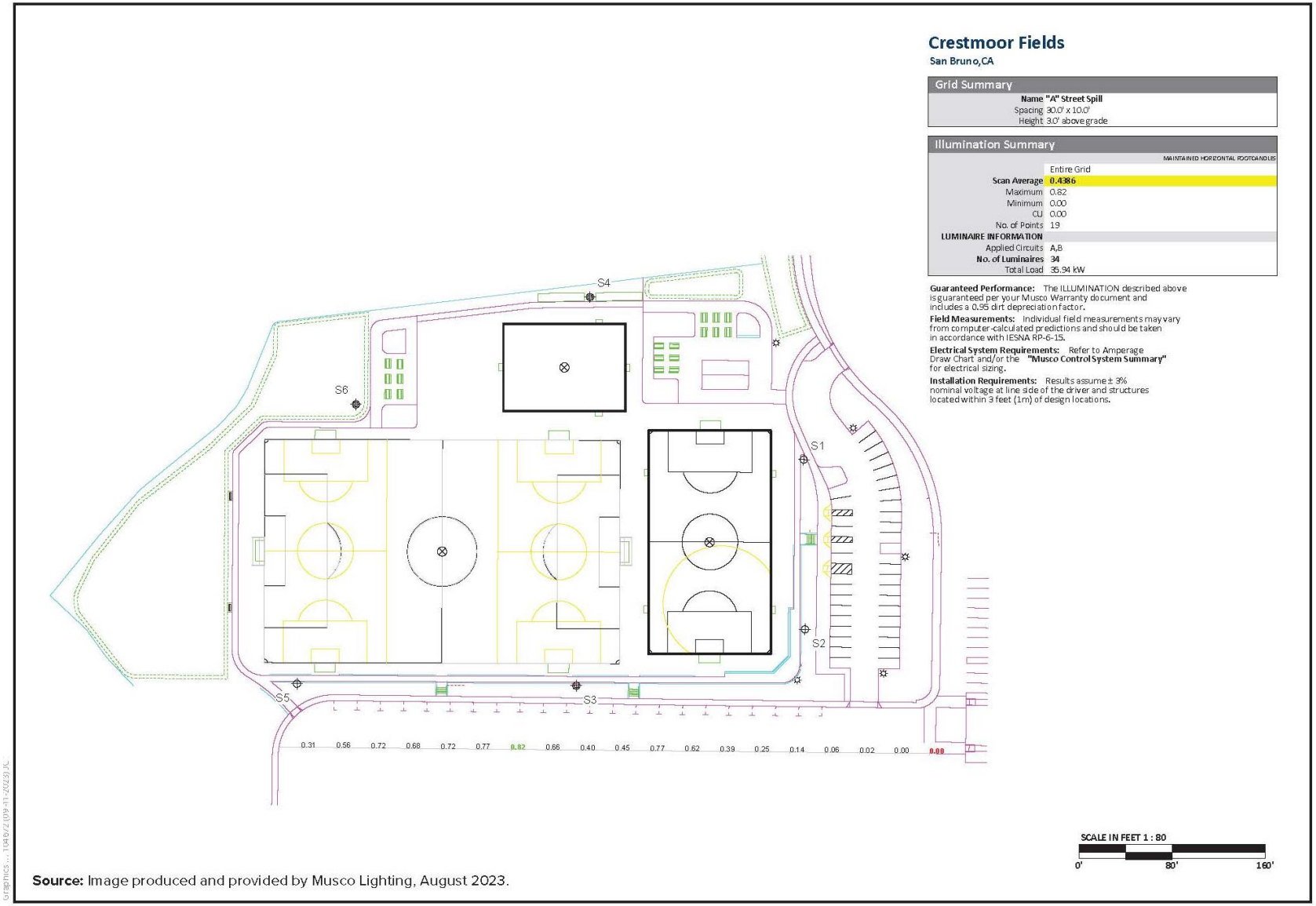
Source: Musco Lighting 2023.

New elevated light sources (field lighting) could cause light trespass outside of the recreation fields; however, field lighting would be designed to minimize light trespass. Musco prepared a light impact analysis that quantified the amount of light trespass beyond the field area, as shown on Figure 3.1-4 and Figure 3.1-5. The project site is categorized in the E3 lighting zone under the IENSA ranking system. Figure 3.1-4 and Figure 3.1-5 show the light trespass in both the horizontal plane (light shined on a floor) and vertical plane (light shined through a window). As shown on Figure 3.1-4, the maximum amount of light trespass along the horizontal plane (i.e., on the ground surface) beyond the project site, "A" Street Spill in the figure, would be approximately 0.44 fc, with an average of 0.82

fc at the edge of the 150-foot buffer around the field. As shown on Figure 3.1-5, the maximum amount of light trespass beyond the project site along the vertical plane would be 1.25 fc with an average of approximately 0.64 fc at the edge of the 150-foot buffer. These average values are substantially lower than the IENSA recommendations for the E3 lighting zone of less than 1 fc during before 10:00 p.m. (ILP 2021); however, the vertical plane lighting would be above the ground, which would make it potentially visible to surrounding uses at a low intensity. Field lighting would not be used after 10:00 p.m.

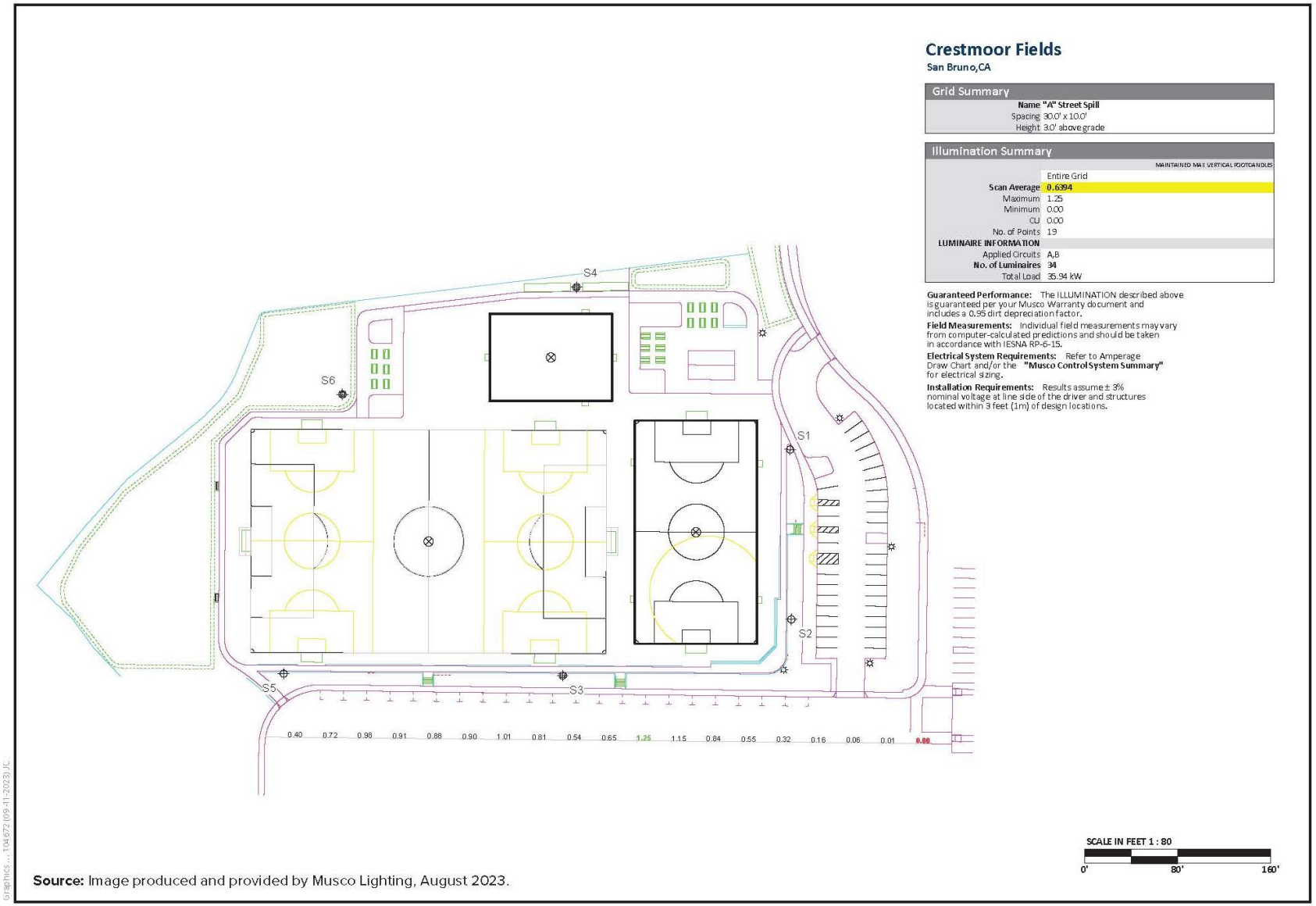
To illustrate the future offsite nighttime lighting conditions, the City commissioned nighttime visual simulations for three offsite KOPs located to the southwest and northeast of the project site in publicly accessible areas where the terrain is slightly elevated and offers a clearer view of the proposed lighting. These locations are shown on Figure 3.1-6. The existing nighttime lighting baseline conditions for all three KOPs showcase the current street lighting and residential nature of the surrounding area, which are shown on Figures 3.1-1, 3.1-2, and 3.1-3; the resulting visual simulations are shown adjacent to existing conditions photographs on Figures 3.1-1, 3.1-2, and 3.1-3. These simulations also illustrate the visibility of the lights with limited light trespass in adjacent neighborhoods, consistent with the numerical evaluation provided above. The proposed lighting would be visible with minor prominence in nighttime lighting conditions when compared to the existing nighttime baseline. Generally, the lighting would largely blend in with existing sources of nighttime light from the KOP locations. Each KOP shows a halo of lighting visible about the play fields, contributing to sky glow. It is likely that the halo effect would be worsened in marine layer or low cloud conditions because the light would reflect off the clouds or be scattered by fog, contributing to anthropogenic skyglow. However, there is already anthropogenic skyglow from other existing lights sources in the area, as demonstrated in the existing nighttime photographs and given the urbanization of the area. As a result, from a qualitative perspective, the nighttime lighting would not appreciably add to existing lighting conditions in a way that adversely affects nighttime views in the area.

The proposed field lighting would generate light intensity that could also cause discomfort glare to sensitive viewers, such as the members of the public on the project site or at viewpoints such as the KOPs, if exposed to a direct or reflected view of a light source. According to International Commission on Illumination glare standards, light intensity within the E3 lighting zone shall not exceed 10,000 candelas during precurfew hours (before 10:00 p.m.). Light intensity at the project site is on average 4,562 candelas, with a minimum of 1,020 candelas and a maximum of 11,781 candelas depending on measurement location and distance from the lights. However, athletic use of the fields and nighttime lighting would be limited to evening practices and games ending by 10:00 p.m., at which time the stadium lights would be shut off, in line with park closure times. Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. The field lights could potentially be on for a longer period of time if nighttime use becomes more frequent, however use would still be required to abide by the 10:00 pm closure time. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and cannot be further analyzed. Therefore, the proposed project and project variant impacts related to light and glare would be **less than significant.**



Source: Image produced and provided by Musco Lighting, August 2023.

Figure 3.1-4. Light Trespass along the Horizontal Plane



Source: Image produced and provided by Musco Lighting, August 2023.

Figure 3.1-5. Light Trespass along the Vertical Plane



Figure 3.1-6. Draft Viewshed Study Seen/Unseen Mapping

3.2 Air Quality

This section evaluates the project's potential environmental impacts on air quality. It first describes the existing air quality conditions of the project area and identifies the state and local plans, policies, and regulations applicable to the project. This is followed by the analysis, which discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.2.1 Existing Conditions

Regulatory Setting

The federal Clean Air Act (CAA) and its subsequent amendments form the basis for the nation's air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the CAA. The National Ambient Air Quality Standards (NAAQS) for criteria pollutants are a key element of the CAA, which delegates enforcement of the NAAQS to the states. The CAA requires that a State Implementation Plan (SIP) or an air quality control plan be prepared for areas with air quality that violates the NAAQS. The SIP sets forth the strategies and pollution control measures that states will use to attain the NAAQS. The CAA requires attainment plans to demonstrate a 5 percent reduction per year in nonattainment air pollutants or their precursors, averaged every consecutive 3-year period, unless an approved alternative measure of progress is developed. Air quality attainment plans outline emissions limits and control measures for achieving and maintaining the standards by the earliest practical date. In California, the California Air Resources Board (CARB) is responsible for reviewing and approving SIP elements prepared by local air districts and other agencies, as well as submitting SIP revisions to the EPA for approval and publication in the *Federal Register*. CARB delegates regulatory authority for stationary sources and other air quality management responsibilities to local air agencies. The Bay Area Air Quality Management District (BAAQMD) is the local air agency for the project area.

The following sections provide more detailed information on federal, state, and local air quality regulations that apply to the proposed project.

Federal

Clean Air Act and National Ambient Air Quality Standards

The federal CAA was enacted in 1963 and amended numerous times in subsequent years (1965, 1967, 1970, 1977, and 1990). The federal CAA establishes federal air quality standards, known as NAAQS, and specifies future dates for achieving compliance. The federal CAA also requires each state to submit and implement a SIP for local areas that fail to meet the standards. The plan must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the federal CAA identify specific emission reduction goals for areas that fail to meet the NAAQS. These amendments require both a demonstration of reasonable progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. Table 3.2-1 shows the NAAQS that are currently in effect for each criteria pollutant. The California Ambient Air Quality Standards (CAAQS) (discussed below) are provided for reference.

Table 3.2-1. Federal and State Ambient Air Quality Standards

Criteria Pollutant	Average Time	California Standards	National Standards[a]	
			Primary	Secondary
Ozone	1 hour	0.09 ppm	None[b]	None[b]
	8 hours	0.070 ppm	0.070 ppm	0.070 ppm
Particulate Matter (PM_{10})	24 hours	50 μg/m³	150 μg/m³	150 μg/m³
	Annual mean	20 μg/m³	None	None
Fine Particulate Matter ($PM_{2.5}$)	24 hours	None	35 μg/m³	35 μg/m³
	Annual mean	12 μg/m³	12.0 μg/m³	15.0 μg/m³
Carbon Monoxide	8 hours	9.0 ppm	9 ppm	None
	1 hour	20 ppm	35 ppm	None
Nitrogen Dioxide	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1 hour	0.18 ppm	0.100 ppm	None
Sulfur Dioxide[c]	Annual mean	None	0.030 ppm	None
	24 hours	0.04 ppm	0.14 ppm	None
	3 hours	None	None	0.5 ppm
	1 hour	0.25 ppm	0.075 ppm	None
Lead	30-day average	1.5 μg/m³	None	None
	Calendar quarter	None	1.5 μg/m³	1.5 μg/m³
	3-month average	None	0.15 μg/m³	0.15 μg/m³
Sulfates	24 hours	25 μg/m³	None	None
Visibility-Reducing Particles	8 hours	—[d]	None	None
Hydrogen Sulfide	1 hour	0.03 ppm	None	None
Vinyl Chloride	24 hours	0.01 ppm	None	None

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for SIPs.

[c] The annual and 24-hour NAAQS for sulfur dioxide apply for only 1 year after designation of the new 1-hour standard in areas that were previously nonattainment areas for the 24-hour and annual NAAQS.

[d] The CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer (visibility of 10 miles or more due to particles when relative humidity is less than 70%).

Source: CARB 2016.

μg/m³ = micrograms per cubic meter; ppm = parts per million

Non-Road Diesel Rule

The EPA has established a series of increasingly strict emissions standards for new off-road diesel equipment and on-road diesel trucks. New construction equipment used for the proposed project, including heavy-duty trucks and off-road construction equipment, would be required to comply with the emissions standards.

Corporate Average Fuel Economy Standards

The National Highway Traffic Safety Administration's (NHTSA) Corporate Average Fuel Economy (CAFE) standards require substantial improvements in fuel economy and reductions in greenhouse gas (GHG) emissions generated by passenger cars and light-duty trucks sold in the United States. On

August 2, 2018, EPA and NHTSA proposed amendments to the current fuel efficiency standards for passenger cars and light-duty trucks and new standards for model years 2021 through 2026. Under the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, current 2020 standards would be maintained through 2026.

On September 19, 2019, EPA and NHTSA issued a final action on the One National Program Rule, which is considered Part One of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards, withdrawing California's CAA preemption waiver to set state-specific standards.[1] The EPA reinstated California's authority under the CAA to implement its own GHG emission standards and zero-emission vehicles (ZEV) sales mandate on March 9, 2022.[2] The current CAFE standards require an industry-wide fleet average of approximately 49 miles per gallon (mpg) for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025, and 10 percent annually for model year 2026 (U.S. Department of Transportation 2022).

State

California Clean Air Act and California Ambient Air Quality Standards

The California CAA established a statewide air pollution control program in 1988. The California CAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the California CAA does not set precise attainment deadlines. Instead, the California CAA establishes increasingly stringent requirements for areas that require more time to achieve the standards. The CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. The CAAQS and NAAQS are listed together in Table 3.2-1.

CARB and local air districts are responsible for achieving California's air quality standards. The standards are to be achieved through district-level air quality management plans, which are incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to CARB, which has delegated that authority to individual air districts (CARB reviews and approves SIP elements prepared by air districts before submitting SIP revisions to the EPA for approval and publication in the *Federal Register*). CARB has traditionally established state air quality standards, maintained oversight authority for air quality planning, developed programs for reducing emissions from mobile sources, developed air emissions inventories, collected air quality and meteorological data, and approved SIPs.

The California CAA substantially increases the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The California CAA also emphasizes control of "indirect and area-wide sources" of air

[1] The One National Program Rule enables EPA and NHTSA to provide nationwide uniform fuel economy and GHG vehicle standards by clarifying that federal law preempts state and local tailpipe GHG standards, affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and withdrawing California's CAA preemption waiver to set state-specific standards.

[2] California, 22 other states, the District of Columbia, and two cities filed suit against Part One of the SAFE Vehicles Rule on September 20, 2019 (*California et al. v. United States Department of Transportation et al.,* 1:19-cv-02826, U.S. District Court for the District of Columbia). On December 12, 2021, NHTSA repealed the SAFE Vehicles Rule, Part One.

pollutant emissions. The California CAA gives local air pollution control districts explicit authority to regulate indirect sources and establish traffic control measures. BAAQMD is the primary agency responsible for working to attain and maintain NAAQS and CAAQS in the Bay Area. BAAQMD's thresholds of significance are generally designed to support attainment and maintenance of the NAAQS and CAAQS.

Statewide Truck and Bus Regulation

CARB adopted the Truck and Bus Regulation in 2008 to focus its efforts on reducing emissions of diesel particulate matter (DPM), nitrogen oxides (NO_X), and other criteria pollutants from diesel-fueled vehicles. This regulation applies to any diesel-fueled vehicle as well as any dual-fuel or alternative-fuel diesel vehicle that travels on public highways, yard trucks with on-road engines, yard trucks with off-road engines used for agricultural operations, school buses, and vehicles with a gross vehicle weight rating (GVWR) of more than 14,000 pounds. The purpose of the regulation is to require trucks and buses registered in the state to have 2010 or newer engines by 2023. Compliance schedules have been established for lighter vehicles (GVWR of 14,000–26,000 pounds) and heavier vehicles (GVWR of more than 26,001 pounds) (CARB 2020a). As of January 1, 2020, only vehicles that met the requirements of the Trucks and Bus Regulation were allowed to register with the California Department of Motor Vehicles.

Small Off-Road Engines Program

CARB first adopted emissions standards for small off-road engines (SORE) in 1990. SORE are spark-ignition engines rated at or below 19 kilowatts primarily used for lawn, garden, and other small off-road equipment (CARB 2021a). In December 2021, CARB approved an amendment to the 1990 SORE regulations requiring most newly manufactured SORE to be zero emission starting in 2024 (CARB 2021b).

Toxic Air Contaminant Regulation

California regulates toxic air contaminants (TACs) primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 ("Hot Spots" Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce exposure to air toxics. The "Hot Spots" Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

CARB has completed a risk management process identifying potential cancer risks for a range of activities and land uses that are affected by the use of diesel-fueled engines (CARB 2000). High-volume freeways, stationary diesel engines, and facilities that attract constant and heavy volumes of diesel vehicle traffic (e.g., distribution centers, truck stops) were identified as areas that pose the highest risk for adjacent receptors. Other facilities associated with increased risks include warehouse distribution centers, large retail or industrial facilities, high-volume transit centers, and schools with a high volume of bus traffic.

In September 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The plan is intended to reduce DPM emissions and associated health risks substantially through the introduction of ultra-low-sulfur diesel fuel, a step that has already been implemented, and cleaner diesel engines

(CARB 2000). The technology for reducing DPM emissions from heavy-duty trucks is well established, and both state and federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions.

CARB's plan also established airborne toxic control measures (ATCMs) for mobile sources, including on-road and off-road vehicles, and stationary sources. With implementation of ATCMs, statewide DPM concentrations decreased from approximately 1.8 micrograms per cubic meter (µg/m^3) to approximately 0.61 µg/m^3 between 1990 and 2012, resulting in a 66 percent reduction over that period (CARB 2023c).

By 2035, CARB estimates that DPM emissions will be less than half of what they were in 2010 (CARB 2023c). CARB continues to explore strategies to reduce DPM emissions through engine retrofits, cleaner diesel fuel, advanced engine technologies, and alternative fuels.

Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations

Asbestos is a naturally occurring mineral that was previously used in building construction because of its heat resistance and strong insulating properties. In 2001, CARB adopted an ATCM for Construction, Grading, Quarrying, and Surface Mining Operations to minimize the release of asbestos fibers during activities involving the handling of asbestos (CARB n.d.[b]). The ATCM requires work practices to minimize asbestos emissions from such activities where naturally occurring asbestos is found or is likely to be found (CARB n.d.[b]).

Air Pollution and Health and Equity Regulation

California has advanced several policies and regulations to address and center health and equity as part of public planning. Many of these regulations have a nexus with air quality. Senate Bill (SB) 535 recognizes that environmental pollution has had a disproportionate effect on disadvantaged communities, and requires these areas be prioritized for emission reduction projects funded by California's cap-and-trade program. Assembly Bill (AB) 1550 expanded funding prioritization from cap-and-trade proceeds to include low-income communities. AB 617 requires the state to monitor and report criteria pollutant and TAC emissions for certain stationary sources. The bill also requires development of a statewide plan to reduce these emissions in communities that experience a high cumulative exposure burden. In response to AB 617, CARB developed the Community Air Protection Program (CAPP), which includes air monitoring and emissions reductions programs, initially focused on 10 designated communities throughout California.

Local

Bay Area Air Quality Management District

At the local level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by the California Environmental Quality Act (CEQA). The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

The proposed project falls within the geographic jurisdiction of BAAQMD. BAAQMD has local air quality jurisdiction over certain stationary sources in the San Francisco Bay Area Air Basin

(SFBAAB) including San Mateo County. No such stationary sources are included in the proposed project; however, BAAQMD has also developed advisory emissions thresholds to assist CEQA lead agencies in determining the level of significance of a project's emissions, which are outlined in its *California Environmental Quality Act Air Quality Guidelines*, as described below.

Air Quality Plans

BAAQMD has also adopted air quality plans to improve air quality, protect public health, and protect the climate, including the *2017 Clean Air Plan: Spare the Air, Cool the Climate* (2017 Clean Air Plan). As described in the above discussion regarding federal air pollution regulations, the CAA requires a SIP or an air quality control plan to be prepared for areas with air quality that violates the NAAQS. BAAQMD's 2017 Clean Air Plan, adopted on April 19, 2017, is the current air quality attainment plan for the SFBAAB (BAAQMD 2017a). It defines control strategies to reduce emissions and ambient concentrations of air pollutants; safeguards public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduces GHG emissions to protect the climate. In addition, the 2017 Clean Air Plan updates the prior 2010 Bay Area ozone (O_3) plan and outlines feasible measures to reduce O_3; provides a control strategy for reducing particulate matter (PM), air toxics, and GHGs in a single integrated plan; and establishes emissions control measures that can be adopted or implemented. Specifically, the Clean Air Plan provides the following.

- Describes the BAAQMD plan for attaining all state and federal air quality standards and eliminating health risk disparities from exposure to air pollution among Bay Area communities;
- Defines a vision for transitioning the region to the post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050;
- Provides a regional climate protection strategy that will put the Bay Area on a pathway to achieving GHG reduction targets; and
- Includes a wide range of control measures to decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as particulate matter, O_3, and TACs; reduce emissions of methane and other GHGs with high global warming potential that are potent climate pollutants in the near term; and decrease emissions of carbon monoxide (CO) by reducing fossil fuel combustion.

In addition to air quality plans, BAAQMD also adopts rules and regulations to improve existing and future air quality. The proposed project may be subject to the following BAAQMD rules.

- Regulation 6, Rule 1 (PM)—This regulation restricts emissions of PM darker than a 1 on the Ringlemann Chart to less than 3 minutes in any 1 hour.
- Regulation 8, Rule 3 (Architectural Coatings)—This regulation limits the quantity of ROG in architectural coatings.
- Regulation 11, Rule 2 (Hazardous Pollutants—Asbestos Demolition, Renovation, and Manufacturing). This regulation, which incorporates EPA's asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, controls emissions of asbestos to the atmosphere during demolition, renovation, and transport activities.

BAAQMD California Environmental Quality Act, Air Quality Guidelines

The BAAQMD *California Environmental Quality Act, Air Quality Guidelines* (CEQA Air Quality Guidelines) were prepared to assist in the evaluation of the air quality impacts of projects and plans proposed within the Bay Area. The CEQA Air Quality Guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA

requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics and odors.

BAAQMD published the most recent version of the CEQA Air Quality Guidelines in April 2023 (2022 CEQA Guidelines). The 2022 CEQA Guidelines include guidance for evaluating plan- and project-level air quality and climate impacts, as well as best practices for centering environmental justice, health, and equity thresholds for evaluating a project's impact on air quality. This analysis was prepared consistent with guidance and recommendations from the most recent 2022 CEQA Guidelines.

City of San Bruno General Plan

The current City of Bruno General Plan, adopted in 2009, includes goals and policies that relate to air quality and emission reduction (City of San Bruno 2009). These goals and policies include continuing to improve air quality by reducing emissions from construction activities, coordinating air quality planning efforts locally and regionally, and focusing improvements on non-motorized modes of transportation. The project's consistency with applicable air quality General Plan policies is evaluated in Section 3.10, *Land Use and Planning*.

The City's General Plan includes the following goals and policies associated with air quality.[3]

- ERC-25: Maintain and improve air quality by requiring project mitigation, such as Transportation Demand Management (TDM) techniques, where air quality impacts are unavoidable.
- ERC-26: Require dust abatement actions for all new construction and redevelopment projects.
- ERC-28: Incorporate air quality beneficial programs and policies into local planning and development activities, with a particular focus on subdivision, zoning, and site design measures that reduce the number and length of single-occupant automobile trips.
- ERC-30: Encourage new residential developments to incorporate measures such as shuttle services to major employment centers, commercial areas and transit areas, and provision of adequate transit facilities.
- ERC-33: Require all large construction projects to mitigate diesel exhaust emissions through use of alternate fuels and control devices.

Environmental Setting

Regional Climate and Meteorology

The project site is located within the SFBAAB. Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. The following discussion summarizes relevant characteristics of the SFBAAB, key pollutants of concern, and existing ambient pollutant concentrations.

Although the primary factors that determine air quality are the locations of air pollutant sources and the quantity of pollutants emitted from those sources, meteorological conditions and topography

[3] The City's General Plan also includes policies associated with transportation, encouraging transportation alternatives, such as walking, bicycling, carpooling, transit-ridership, and flex-scheduling, which reduce transportation-related air pollutant emissions.

are also important factors. Atmospheric conditions, such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. Unique geographic features throughout the state define 15 air basins with distinctive regional climates.

The air quality study area is located in the San Francisco Peninsula region of the SFBAAB (BAAQMD 2017b). This region extends from northwest of San Jose to the Golden Gate. The Santa Cruz Mountains, part of the Pacific Coast Ranges, run up the center of the peninsula, with elevations exceeding 2,000 feet at the southern end and decreasing to 500 feet in South San Francisco. Coastal towns experience a high incidence of cool, foggy weather in the summer. Cities in the southeastern peninsula experience warmer temperatures and fewer foggy days because the marine layer is blocked by the ridgeline to the west. In San Bruno, some marine air is able to flow into the city, resulting in cool temperatures.

The blocking effect of the Santa Cruz Mountains results in variations in summertime maximum temperatures in different parts of the peninsula. For example, in coastal areas the mean maximum summer temperatures are in the mid-60s, while in Redwood City, on the other side of the ridge, the mean maximum summer temperatures are in the low-80s. Mean minimum temperatures during the winter months are in the high-30s to low-40s on the eastern side of the Peninsula and in the low 40s on the coast.

Two important gaps in the Santa Cruz Mountains occur on the peninsula. The larger of the two is the San Bruno Gap, extending from Fort Funston on the ocean to the San Francisco International Airport. Marine air is easily able to penetrate into the bay because the gap is oriented in the same northwest to southeast direction as the prevailing winds and because the elevations along the gap are below 200 feet. The other gap is the Crystal Springs Gap, between Half Moon Bay and San Carlos. As the sea breeze strengthens on summer afternoons, the gap permits maritime air to pass across the mountains, and its cooling effect is commonly seen from San Mateo to Redwood City.

Annual average wind speeds range from 5 to 10 miles per hour (mph) throughout the peninsula, with higher wind speeds usually found along the coast. Winds on the eastern side of the peninsula are often high in certain areas, such as near the San Bruno Gap and the Crystal Springs Gap.

The prevailing winds along the peninsula's coast are from the west, although individual sites can show significant differences. For example, Fort Funston in western San Francisco shows a southwest wind pattern while Pillar Point in San Mateo County shows a northwest wind pattern. On the east side of the mountains, winds are generally from the west, although wind patterns in this area are often influenced greatly by local topographic features.

Air pollution potential is highest along the southeastern portion of the peninsula. This is the area most protected from the high winds and fog of the marine layer. Pollutant transport from upwind sites is common. In the southeastern portion of the peninsula, air pollutant emissions are relatively high due to motor vehicle traffic as well as stationary sources. At the northern end of the peninsula in San Francisco, pollutant emissions are high, especially from motor vehicle congestion. Localized pollutants, such as CO, can build up in “urban canyons.” Winds are generally fast enough to carry the pollutants away before they can accumulate.

Pollutants of Concern

Criteria Pollutants

As previously discussed, the federal and state governments have established ambient air quality standards for six criteria pollutants. Ozone is considered a regional pollutant because its precursors affect air quality on a regional scale. Pollutants such as CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are considered local pollutants that tend to accumulate in the air locally. PM is both a regional and local pollutant. The primary criteria pollutants generated by the project are ozone precursors (i.e., NO_X and reactive organic gases [ROG]), CO, and PM (Reşitoğlu 2018).[4, 5]

All criteria pollutants can have human health effects at certain concentrations. The ambient air quality standards for these pollutants are set to protect public health and the environment with an adequate margin of safety (CAA Section 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants, and form the scientific basis for new and revised ambient air quality standards.

The principal characteristics and possible health and environmental effects from project-generated exposure to primary criteria pollutants are summarized in Table 3.2-2 and described in more detail below.

Ozone

O_3, a secondary air pollutant, is produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_X. The main sources of ROG and NO_X, often referred to as O_3 precursors, are combustion processes, including combustion in motor vehicle engines, and the evaporation of solvents, paints, and fuels. In the Bay Area, automobiles are the largest source of O_3 precursors. O_3 is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with O_3 production through the photochemical reaction process. O_3 causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

[4] As discussed above, there are also ambient air quality standards for SO_2, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulates. However, these pollutants are typically associated with industrial sources, which are not included as part of the project. Accordingly, they are not evaluated further.

[5] Most emissions of NO_x are in the form of nitric oxide (NO). Conversion to NO_2 occurs in the atmosphere as pollutants disperse downwind. Accordingly, NO_2 is not considered a local pollutant of concern for the project and is not evaluated further.

Table 3.2-2. Sources and Health Effects of Air Pollutants

Pollutant	Sources	Primary Effects
Ozone (O_3)	• Precursor sources: motor vehicles, industrial emissions, and consumer products[a]	• Respiratory symptoms. • Worsening of lung disease, leading to premature death. • Damage to lung tissue. • Crop, forest, and ecosystem damage. • Damage to a variety of materials, including rubber, plastics, fabrics, paints, and metals.
Particulate Matter Less than 2.5 Microns in Aerodynamic Diameter ($PM_{2.5}$)	• Cars and trucks (especially diesel vehicles). • Fireplaces and wood stoves. • Windblown dust from roadways, agriculture, and construction.	• Premature death. • Hospitalization for worsening of cardiovascular disease. • Hospitalization for respiratory disease. • Asthma-related emergency room visits. • Increased symptoms and increased inhaler usage.
Particulate Matter Less than 10 Microns in Aerodynamic Diameter (PM_{10})	• Cars and trucks (especially diesel vehicles). • Fireplaces and wood stoves. • Windblown dust from roadways, agriculture, and construction.	• Premature death and hospitalization, primarily from worsening of respiratory disease. • Reduced visibility and material soiling.
Nitrogen Oxides (NO_X)	• Any source that burns fuel, such as cars, trucks, construction and farming equipment, and residential heaters and stoves.	• Lung irritation. • Enhanced allergic responses.
Carbon Monoxide (CO)	• Any source that burns fuel, such as cars, trucks, construction and farming equipment, and residential heaters and stoves.	• Chest pain in patients with heart disease. • Headaches. • Light-headedness. • Reduced mental alertness.
Sulfur Oxides (SO_X)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Worsening of asthma (e.g., increased symptoms, increased medication usage, emergency room visits).
Lead (Pb)	• Contaminated soil. • Lead-based paints.	• Impaired mental functioning in children. • Learning disabilities in children. • Brain and kidney damage.
Toxic Air Contaminants (TACs)	• Cars and trucks (especially diesel vehicles). • Industrial sources, such as chrome platers. • Neighborhood businesses, such as dry cleaners and service stations. • Building materials and products.	• Cancer. • Reproductive and developmental effects. • Neurological effects.

[a] O_3 is not generated directly by these sources. Rather, precursor pollutants from these sources (ROG and NOX) react with sunlight to form O_3 in the atmosphere.

Source: CARB 2023a.

Carbon Monoxide

CO, an odorless, colorless gas, is usually formed as the result of incomplete combustion in fuels. The largest source of CO is motor vehicles. CO transport is limited; it disperses with distance from a source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels and adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections that operate at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue; impair central nervous system function; and induce angina (chest pain) in persons with serious heart disease. Extremely high levels of CO can be fatal.

Particulate Matter

Particulate matter is a class of air pollutants that consists of heterogeneous solid and liquid airborne particles from man-made and natural sources. Particulate matter is categorized according to two size ranges: PM_{10} for particles less than 10 microns in diameter and $PM_{2.5}$ for particles less than 2.5 microns in diameter. In the Bay Area, motor vehicles generate about half of the air basin's particulate matter through tailpipe emissions as well as brake wear and tire wear; travel over paved and unpaved roads also results in particulate matter in the form of suspended dust particles. Fireplaces and stoves that burn wood, industrial facilities, and construction involving ground-disturbing activities are other sources of such fine particulates, which are small enough to be inhaled into the deepest parts of the human lung and cause adverse health effects. According to CARB, studies in the United States and elsewhere have demonstrated a strong link between elevated particulate levels and premature deaths, hospital admissions, emergency room visits, and asthma attacks. Studies of children's health in California have demonstrated that particle pollution may significantly reduce lung function in children (CARB 2023b). Statewide attainment of particulate matter standards could reduce the number of premature deaths, hospital admissions for cardiovascular and respiratory disease, asthma-related emergency room visits, and episodes of respiratory illness in California.

Nitrogen Dioxide

NO_2, a reddish-brown gas, is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to O_3 formation, NO_2 also contributes to other pollution problems, including high concentrations of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on days with high levels of pollution, especially in conjunction with high O_3 levels. NO_2 decreases lung function and may reduce resistance to infection.

Sulfur Dioxide

SO_2 is a colorless acidic gas with a strong odor. It is produced from the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO_2 also reduces visibility and the level of sunlight at the ground surface.

Lead

Lead, a metal, is found naturally in the environment as well as manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in the air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the EPA established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of EPA regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air have decreased dramatically.

Toxic Air Contaminants

Although ambient air quality standards have been established for criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risks they present. Health risks from TACs are a function of both the concentration and the duration of exposure. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA) The primary TACs of concern associated with the project are asbestos and DPM.

Asbestos is the name given to several naturally occurring fibrous silicate minerals. Before the adverse health effects of asbestos were identified, asbestos was widely used as insulation and fireproofing in buildings, and for materials such as plaster, glue for flooring, and vinyl floor panels. It can still be found in some older buildings. It is also found in its natural state in certain kinds of rock and soil. The inhalation of asbestos fibers into the lungs can result in a variety of adverse health effects, including inflammation of the lungs, respiratory ailments (e.g., asbestosis, which is scarring of lung tissue that results in constricted breathing), and cancer (e.g., lung cancer and mesothelioma, which is cancer of the linings of the lungs and abdomen).

DPM is generated by diesel-fueled equipment and vehicles. Within the Bay Area, BAAQMD has found that of all controlled TACs, emissions of DPM are responsible for about 82 percent of the total ambient cancer risk (BAAQMD 2017a). Unlike TACs emitted from industrial and other stationary sources, most DPM is emitted from mobile sources, primarily diesel-powered construction and mining equipment, agricultural equipment, truck-mounted refrigeration units, and trucks and buses traveling on freeways and local roadways. Agricultural and mining equipment is not commonly used in the urban parts of the Bay Area, and construction equipment typically operates at various locations for only a limited time. As a result, the readily identifiable locations where DPM is emitted in the Bay Area include high-traffic roadways and other areas with substantial truck traffic.

Short-term exposure to DPM can cause acute irritation (e.g., eye, throat, and bronchial), neurophysiological symptoms (e.g., lightheadedness and nausea), and respiratory symptoms (e.g., cough and phlegm). The EPA has determined that diesel exhaust is “likely to be carcinogenic to humans by inhalation” (EPA 2003). Air pollutant exposures and their associated health burdens

vary considerably at particular locations in relation to the sources of the air pollutants. Motor vehicle traffic is perhaps the most important source of air pollution in urban areas. Air quality research consistently demonstrates that pollutant levels are substantially higher near freeways and busy roadways, and human health studies have consistently demonstrated that children living within 100 to 200 meters (328 to 656 feet) of freeways or busy roadways have reduced lung function and higher rates of respiratory disease (CARB 2005). Engine exhaust from diesel, gasoline, and other combustion engines is a complex mixture of particles and gases with collective and individual toxicological characteristics. At present, it is not possible to attribute the effects of roadway proximity on non-cancer health effects to one or more specific vehicle type or vehicle pollutant.

BAAQMD regulates TACs with a risk-based approach that uses a Health Risk Assessment (HRA) to determine which sources and which pollutants to control as well as the degree of control. An HRA is an analysis in which human exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances in order to provide a quantitative estimate of health risks.[6] As part of ongoing efforts to identify and assess potential health risks to the public, BAAQMD has collected and compiled air toxics emissions data from industrial and commercial sources of air pollution throughout the Bay Area. At the state level, CARB is exploring strategies to reduce DPM emissions, as noted above, such as developing rules and regulations to reduce emissions from transportation refrigeration units and municipal transit vehicles.

Odors

Although offensive odors rarely cause physical harm, they can be unpleasant and lead to considerable distress among the public. This distress often generates citizen complaints to local governments and air districts. BAAQMD's 2022 CEQA Guidelines identify several types of land uses as being commonly associated with odors, such as landfills, wastewater treatment facilities, food processing facilities, painting/coating operations, and metal smelting plants (BAAQMD 2023b). Odor impacts on nearby residential areas and other sensitive receptors, such as hospitals, worker sites, day care centers, and schools, warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, work sites, and commercial areas.

Environmental Burdens

OEHHA maintains the California Communities Environmental Health Screening Tool (CalEnviroScreen), which provides relative rankings of census tracts based on 21 environmental, health, demographic, and socioeconomic indicators (e.g., ozone concentrations, groundwater threats, education levels). Ranking scores are provided for each indicator, which are also combined to provide an overall ranking score for the census tract. The scores are not a measure of health risk; rather, they reflect the relative pollution burden and vulnerabilities in one census tract compared to other census tracts in the state. Scores are given on a scale of 0 to 100, with larger numbers representing areas with relatively high existing pollution burdens and population sensitivities.

[6] In general, a health risk assessment is recommended if BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggests a potential public health risk. Such an assessment generally evaluates chronic, long-term effects, including the increased risk of cancer as a result of exposure to one or more TACs.

Disadvantaged communities are defined as the census tracts ranking in the top 25th percentile for environmental burdens and socioeconomic conditions (i.e., CalEnviroScreen score of 75 or higher). Low-income communities are defined as the census tracts that are either at or below 80 percent of the statewide median income, or at or below the threshold designated as low-income by the California Department of Housing and Community Development's state income limits.

The proposed project is located within census tract 6081603802, which has a CalEnviroScreen percentile score of 29. This score indicates that the census tract experiences more-minor pollution and secondary effects than the rest of the state (OEHHA 2023). As the census tract has a CalEnviroScreen percentile score lower than 70 percent, it is not considered an overburdened community per BAAQMD guidance (BAAQMD 2023b).

Existing Air Quality Conditions

CARB and the EPA maintain ambient air quality monitoring stations within California. There are no monitoring stations in the City of San Bruno. The air quality monitoring station closest to the project site is the San Francisco-Arkansas monitoring station in San Francisco, which monitors criteria air pollutants. The air quality trends from this station are used to represent ambient air quality in the project area. Ambient air quality in the project area from 2019 to 2021 (the most recent available period) is shown in Table 3.2-3. The pollutants monitored at the San Francisco-Arkansas station are O_3, CO, NO_2, PM_{10}, and $PM_{2.5}$.

Existing TAC Sources and Health Risks

BAAQMD maintains an inventory of health risks associated with all permitted stationary sources within the SFBAAB, which is available online (BAAQMD 2020). Within 1,000 feet of the project site, there is one permitted facility with a background health risk: a Verizon Wireless generator at 250 Courtland Drive used for telecommunications purposes. Aside from stationary sources, emissions of TACs around the project site are also generated from mobile sources on roads and highways, including Interstate 280 and State Route 35. Health risks associated with the nearby permitted stationary source, as well as highways and surface streets, are considered in the analysis of the project's cumulative health risks. There are no rail sources of health risks in the project area.

Regional Attainment Status

Local monitoring data are used to designate areas as nonattainment, maintenance, attainment, or unclassified areas for ambient air quality standards. The four designations are defined below. Table 3.2-4 summarizes the attainment status of San Mateo County.

- Nonattainment—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment—assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- Unclassified—assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Table 3.2-3. Ambient Air Quality Data for the Project Area (2019–2021)

Pollutant Standards	2019	2020	2021
Ozone (O_3) at San Francisco-Arkansas station			
Maximum 1-hour concentration (ppm)	0.091	0.088	0.074
Maximum 8-hour concentration (ppm)	0.073	0.055	0.054
Fourth highest 8-hour concentration (ppm)	0.053	0.048	0.051
Number of days standard exceeded			
CAAQS 1-hour standard (> 0.09 ppm)	0	0	0
CAAQS 8-hour standard (> 0.070 ppm)	1	0	0
NAAQS 8-hour standard (> 0.070 ppm)	1	0	0
Carbon Monoxide (CO) at San Francisco-Arkansas station			
Maximum 8-hour concentration (ppm)	1	1.6	0.9
Maximum 1-hour concentration (ppm)	1.2	1.8	1.2
Number of days standard exceeded			
NAAQS 8-hour standard (≥ 9 ppm)	0	0	0
CAAQS 8-hour standard (≥ 9.0 ppm)	0	0	0
NAAQS 1-hour standard (> 35 ppm)	0	0	0
CAAQS 1-hour standard (≥ 20 ppm)	0	0	0
Nitrogen Dioxide (NO_2) from San Francisco-Arkansas station			
Maximum state 1-hour concentration (ppm)	0.061	0.047	0.049
Annual average concentration (ppm)	0.009	0.008	0.007
Number of days standard exceeded			
CAAQS 1-hour standard (0.18 ppm)	0	0	0
NAAQS 1-hour standard (0.100 ppm)	0	0	0
Particulate Matter (PM_{10}) at San Francisco-Arkansas station			
Maximum state 24-hour concentration (μg/m^3)	42.1	105.0	33.0
Maximum national 24-hour concentration (μg/m^3)	42.1	102.3	32.2
National annual average concentration	7.5	12.0	8.2
Measured number of days standard exceeded			
CAAQS 24-hour standard (50 μg/m^3)	0	2	0
NAAQS 24-hour standard (150 μg/m^3)	0	0	0
Particulate Matter ($PM_{2.5}$) at San Francisco-Arkansas station			
Maximum state 24-hour concentration (μg/m^3)	25.4	147.3	22.4
Maximum national 24-hour concentration (μg/m^3)	25.4	147.3	22.4
National annual average concentration	7.6	10.5	7.1
Measured number of days standard exceeded			
NAAQS 24-hour standard (> 35 μg/m^3)	0	8	0

Sources: CARB n.d.; EPA 2022.

ppm = parts per million; μg/m^3 = micrograms per cubic meter

An exceedance is not necessarily a violation.

State statistics are based on local conditions data; state statistics are based on California-approved samplers.

National statistics are based on standard conditions data. In addition, national statistics are based on samplers, using federal reference or equivalent methods. State criteria for ensuring data are adequate for calculating valid annual averages are more stringent than national criteria.

Table 3.2-4. Federal and State Attainment Status for San Mateo County Portion of the SFBAAB

Criteria Pollutant	Federal Designation	State Designation
Ozone (8-hour)	Marginal Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment
Particulate Matter (PM_{10})	Unclassified	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Moderate Nonattainment (2006)	Nonattainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(No Federal Standard)	Attainment
Hydrogen Sulfide	(No Federal Standard)	Unclassified
Visibility-Reducing Particles	(No Federal Standard)	Unclassified

Sources: CARB 2020b; EPA 2023.

Sensitive Receptors

Sensitive land uses are generally considered to include those land uses where exposure to pollutants could result in health-related risks to sensitive individuals, including children and the elderly. Per BAAQMD, "sensitive receptors include children, the elderly, offsite workers, students, and those with preexisting medical conditions. They are typically found in residences, schools, parks and playgrounds, daycare centers, nursing homes, and medical facilities, but some receptors are overlooked because they are found in an unlikely location…encampments for the unhoused, warehouses with indoor sports facilities for children and youth, privately operated indoor playgrounds for young children, and privately operated youth-serving facilities" (BAAQMD 2023b).

Sensitive receptors in the project area include the residences directly adjacent to the northern, western, and southern boundaries of the project site, Junipero Serra Park approximately 190 meters southeast of the project site, and churches (which may employ offsite workers) approximately 115 meters east and 385 meters northwest of the project site. There are no schools within 1,000 feet of the project site.

3.2.2 Environmental Impacts

Methods for Analysis

Construction Mass Emissions

Construction of the proposed project would generate ROG, NO_X, PM_{10}, and $PM_{2.5}$ emissions that could result in short-term air quality effects. Emissions would be released in the form of exhaust from off-road equipment; exhaust from employee vehicles, vendor trucks, and haul trucks; fugitive dust from site grading and earthmoving; suspended road dust from vehicle travel; and off-gassing from architectural coatings and paving.

Although the BAAQMD regional construction thresholds do not require quantification of fugitive dust emissions because the threshold of significance relates to implementation of best management practices (BMPs), this analysis estimates fugitive dust, because BAAQMD requires both exhaust and fugitive dust emissions be included for the $PM_{2.5}$ concentration analysis (see Impact AQ-3). Short-

term emissions generated by project construction were calculated using CalEEMod Version 2022.1, which uses vehicle emission factors from CARB's EMFAC2021, as recommended by BAAQMD and other air districts in California (CAPCOA 2022). Modeling was based on project-specific information where available, including demolition quantities, building types and sizes, expected construction phase durations, and the area to be graded or paved; assumptions for construction activities, such as the equipment inventory and number of truck trips; and default values from CalEEMod, which are generated by the model based on a project's location and land use type. Construction equipment and activities for the project variant would be the same as the proposed project. Detailed model assumptions and inputs for the calculations can be found in Appendix B, *Air Quality and Greenhouse Gas Emissions*.

Operation Mass Emissions

Project operation would generate emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ that could result in long-term air quality effects during the operations period. Conservatively, the proposed project could be fully operational by 2026 though the expected year is 2027; the ultimate schedule of home construction would depend on economic conditions. The methodologies used to estimate the operational criteria pollutant emission resulting from operation of the proposed project are described below.

During operations, the largest source of emissions would be motor vehicles (largely consisting of residents' vehicles) traveling to and from the project site. These emissions were estimated using traffic data provided by Fehr & Peers and CalEEMod, which uses vehicle emission factors from CARB's EMFAC2021. The traffic data (i.e., the daily vehicle trip rates) was entered into the mobile-source module of CalEEMod to estimate GHG emissions resulting from project-related vehicle trips.

Area-source emissions would result from the reapplication of architectural coatings as part of ongoing building maintenance, the use of consumer products, and the use of landscaping equipment. CalEEMod default values were used to estimate the project's area-source emissions.

For operational energy use, CalEEMod estimates criteria pollutant emissions from the onsite combustion of natural gas, but not from electricity consumption. Because the proposed project would not use any natural gas on site, criteria pollutant emissions associated with building energy use were assumed to be zero.

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. Increased use of the field facilities could result in additional vehicle trips to and from the project site, as well as corresponding increases in criteria pollutant emissions. However, at this time, the City has no certain future users, and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and cannot be further analyzed.

Operational activities for the project variant would be the same as the proposed project. Detailed model assumptions and inputs for the calculations can be found in Appendix B, *Air Quality and Greenhouse Gas Emissions*.

Health Risk Analysis

An HRA was prepared to quantify the levels of exposure from emissions of TACs and $PM_{2.5}$ at sensitive receptors for project construction. Project operation would not be a significant source of DPM, because operational activities involving the use diesel-fueled equipment and vehicles would be minor and infrequent. Furthermore, as described above, the BAAQMD mixed-use screening tool indicates that the proposed land use types and sizes would not result in emissions exceeding applicable BAAQMD operational thresholds (BAAQMD 2023a). Though the BAAQMD mixed-use screening tool applies to impacts from criteria pollutant emissions and precursors, rather than DPM, this conclusion provides evidence that project operation would not be a substantial source of any air pollutant. The HRA methods are described below, and all HRA modeling assumptions and results can be found in Appendix B, *Air Quality and Greenhouse Gas Emissions*.

DPM and $PM_{2.5}$

Project construction activities would generate DPM and $PM_{2.5}$ emissions. Because the project would introduce DPM and $PM_{2.5}$ emissions in an area near existing sensitive receptors, an HRA was conducted in accordance with BAAQMD guidelines. The HRA uses EPA's most recent air dispersion model, AERMOD (version 22112); cancer and chronic risk assessment values for DPM provided by OEHHA; and other assumptions for model inputs recommended in BAAQMD's 2022 CEQA Guidelines, Appendix E: *Recommended Methods for Screening and Modeling Local Risks and Hazards* (BAAQMD 2023b). The HRA applies the most recent guidance and calculation methods from OEHHA's *Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk Assessments* (OEHHA 2015). The HRA consists of three parts: an emissions inventory, air dispersion modeling, and risk calculations. A description of each part is included below.

Emissions Inventory

The emissions inventory includes DPM and $PM_{2.5}$ emissions from project construction. During construction, off-road equipment and on-road trucks would generate DPM emissions. The construction $PM_{2.5}$ inventory consists of $PM_{2.5}$ exhaust from equipment and vehicles, and fugitive dust emissions generated by onsite soil movement and the travel of trucks and construction worker vehicles on roadways.

Air Dispersion Modeling

The HRA used EPA's AERMOD model to model annual average DPM and $PM_{2.5}$ concentrations at existing sensitive receptors. Modeling inputs, including emission rates and source characteristics (e.g., release height, stack diameter, plume width) were based on guidance provided by OEHHA, BAAQMD, and the South Coast Air Quality Management District (SCAQMD).[7]

The project site is located closest to the San Francisco International Airport (KSFO) BAAQMD monitoring station. Meteorological data from KSFO air monitoring station was used to model pollutant concentrations at existing, offsite sensitive receptors. The AERMET data, provided by BAAQMD, represents 2013 through 2017 monitoring (BAAQMD 2022a).

[7] Emissions from off-road equipment were modeled using a release height consistent with SCAQMD guidance and representative of the proposed equipment types (SCAQMD 2008). This parameter does not depend on a project's geographic location and is appropriate for use outside of the SCAQMD's jurisdiction.

Construction

Onsite construction emissions from off-road equipment and onsite trucks were characterized as polygon area sources that outline the footprint of the project area. Release heights of 5.0 meters and 3.4 meters above the ground represented emissions from off-road equipment and onsite trucks, and onsite fugitive dust emissions (SCAQMD 2008; BAAQMD 2023b). The release height represents the height above the ground at which pollutants are emitted. On-road travel emissions from haul and vendor trucks (DPM and $PM_{2.5}$) and construction worker vehicles ($PM_{2.5}$ only) were characterized as line volume sources with a release height of 3.4 meters. Line volume sources utilize a series of volume sources to represent a line.

To account for the plume rise associated with mechanically generated air turbulence from construction emissions for the AERMOD run, the initial vertical dimensions of the area sources were modeled at 4.7 meters for emissions from offroad equipment and 3.2 meters for emissions from onsite trucks; for the line volume sources, the initial vertical dimensions were modeled as 3.2 meters for emissions from onroad trucks. Plume rise is the height that pollutants rise above a release height. For exhaust, plume rise occurs because of the temperature of the exhaust gas, because exhaust gas temperatures can be high, which causes the plume to rise. For dust, plume rise accounts for the mechanical entrainment of dust in the wheels of equipment and trucks. Emissions from off-road equipment were assumed to be generated throughout the construction footprint. Emissions from offsite trucks were modeled along the construction haul route road segments within 1,000 feet of the construction footprint. Construction haul routes were provided by the project applicant. The construction DPM emissions, source parameters, and figures highlighting the construction footprint modeled in the HRA are provided in Appendix B, *Air Quality and Greenhouse Gas Emissions*.

Modeling Domain and Receptor Network

The modeling of emissions from construction activities was based on typical construction hours and days (8 hours per day, 5 days per week). The urban dispersion option was used in the analysis because the project site is located in an urban area. Additionally, the surrounding areas are developed with buildings and paved surfaces that can influence how pollutants are dispersed in the area.

Offsite sensitive receptors were modeled in AERMOD at individual residential properties, worker sites, recreational uses, or school sites in all directions within at least 1,000 feet of the project site using a 20- by- 20-meter receptor grid. Receptors were given a height of 1.5 meters, consistent with BAAQMD guidance (BAAQMD 2023b).

Health Risk Exposure Estimation

The risk calculations incorporate OEHHA's age sensitivity factors, which account for increased sensitivity to carcinogens during early-in-life exposure. The approach for estimating cancer risk from long-term inhalation, including exposure to carcinogens, requires calculating a range of potential doses and multiplying by cancer potency factors in units corresponding to the inverse dose to obtain a range of cancer risks. For cancer risk, the risk for each age group is calculated using the appropriate daily breathing rates, age sensitivity factors, and exposure durations. The cancer risks calculated for individual age groups are summed to estimate the cancer risk for each receptor. Chronic cancer and hazard risks were calculated using values from OEHHA's 2015 HRA guidance (OEHHA 2015).

This analysis evaluates cancer risks at offsite receptor locations beginning in the third trimester of pregnancy, exposed to the full construction duration of 1.5 years.

Refer to Appendix B, *Air Quality and Greenhouse Gas Emissions*, for the risk calculations and additional assumptions.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the following conditions.

- Impact AQ-1: Conflict with or obstruction of implementation of the applicable air quality plan.
- Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard.
- Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations.
- Impact AQ-4: Result in other emissions (such as those leading to odors) affecting a substantial number of people.

Local Air District Thresholds

Regional Thresholds for Air Basin Attainment of State and Federal Ambient Air Quality Standards

This analysis evaluates the impacts of regional emissions generated by the project using a two-tiered approach that considers guidance recommended by BAAQMD in the agency's CEQA Air Quality Guidelines (BAAQMD 2023b). First, this analysis considers whether the proposed project would conflict with the most recent air quality plan (BAAQMD 2017a). Specifically, the impact analysis evaluates whether the project would support the primary goals of the 2017 Clean Air Plan, including applicable control measures, and whether it would disrupt or hinder implementation of any control measures. Secondly, calculated regional criteria pollutant emissions are compared with BAAQMD's project-level thresholds (BAAQMD 2023b). BAAQMD's thresholds, as summarized in Table 3.2-5, are recommended by the agency to evaluate the significance of a project's regional criteria pollutant emissions. According to BAAQMD, projects with emissions in excess of the project-level thresholds, shown in Table 3.2-5, would be expected to have a significant cumulative impact on regional air quality because an exceedance of the thresholds is anticipated to contribute to NAAQS and CAAQS violations.

Significance thresholds established by an air district are used to manage total regional and local emissions within an air basin, based on the air basin's attainment status for criteria air pollutants. The project-level emission thresholds, shown in Table 3.2-5, were established for individual development projects that could contribute to regional and local emissions and adversely affect or delay the air basin's projected attainment target goals for nonattainment criteria air pollutants.

Table 3.2-5. BAAQMD Project-Level Regional Criteria Pollutant Emissions Thresholds

Analysis	Thresholds
Regional Criteria Pollutants (Construction)	• Reactive Organic Gases (ROG): 54 pounds/day • Nitrogen Oxides: 54 pounds/day • Particulate Matter (PM_{10}): 82 pounds/day (exhaust only); compliance with BMPs (fugitive dust) • Fine Particulate Matter ($PM_{2.5}$): 54 pounds/day (exhaust only); compliance with BMPs (fugitive dust)
Regional Criteria Pollutants (Operations)	• Reactive Organic Gases (ROG): Same as construction • Nitrogen Oxides (NO_X): Same as construction • Particulate Matter (PM_{10}): 82 pounds/day • Fine Particulate Matter ($PM_{2.5}$): 54 pounds/day

Source: BAAQMD 2023b.

Because of the conservative nature of the significance thresholds, as well as the basin-wide context of individual development project emissions, there is no direct correlation between a single project and localized air quality–related health effects. One individual project that generates emissions that exceed a threshold does not necessarily result in adverse health effects for residents in the vicinity. This condition is especially true when the criteria air pollutants that exceed thresholds are those with regional effects, such as O_3 precursors (e.g., NO_X and ROG). Furthermore, by its very nature, air pollution is largely a cumulative impact. No single project is large enough by itself to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality is considered significant. In developing thresholds of significance for air pollutants, the air districts have considered the emission levels at which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts on the region's existing air quality conditions.

Health-Based Thresholds for Project-Generated Pollutants of Human Health Concern

All criteria pollutants generated by the proposed project are associated with some form of health risk (e.g., asthma, lower respiratory problems). Criteria pollutants can be classified as either regional pollutants or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. O_3 is considered a regional criteria pollutant, whereas CO, NO_2, SO_2, and lead are localized pollutants. Particulate matter can be both a local and a regional pollutant, depending on its composition. The primary criteria pollutants of concern generated by the proposed project would be O_3 precursors (i.e., ROG and NO_X), CO, and particulate matter, including DPM.

The sections that follow discuss thresholds and analysis considerations for regional and local project-generated criteria pollutants with respect to their human health implications.

Regional Project-Generated Criteria Pollutants (Ozone Precursors and Regional Particulate Matter)

BAAQMD's 2022 CEQA Guidelines note that, to comply with the Friant Ranch decision,[8] "lead agencies need to sufficiently explain the nature and magnitude of significant impacts identified by criteria air pollutant and precursor air quality analyses such that readers can meaningfully understand them. Moreover, lead agencies must make a reasonable effort to connect a project's emissions, where significant, to foreseeable health impacts or provide evidence as to why such an analysis is not scientifically possible" (BAAQMD 2023b).

As discussed above, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations as well as attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates that there are known safe concentrations of criteria pollutants. Although recognizing that air quality is a cumulative problem, air districts typically consider projects that generate criteria pollutant and O_3 precursor emissions that are below the thresholds to be minor in nature. Such projects would not adversely affect air quality or exceed the NAAQS or CAAQS. For projects generating emissions that exceed the mass emissions thresholds, BAAQMD recommends tying the project emissions to potential negative health consequences if scientifically feasible.

Localized Project-Generated Criteria Pollutant Emissions (Carbon Monoxide and Particulate Matter) and Air Toxics (Diesel Particulate Matter and Asbestos)

Localized pollutants generated by a project can be deposited near the emissions source, potentially affecting the nearby population. Although these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. The localized pollutants of concern that would be generated by the project are CO, particulate matter, DPM, and asbestos. The applicable thresholds for each pollutant are described below.

Carbon Monoxide

Heavy traffic congestion can contribute to high levels of CO. Individuals exposed to such "hot spots" may have a greater likelihood of developing adverse health effects. BAAQMD has adopted screening criteria that provide a conservative indication of whether project-generated traffic would cause a potential CO hot spot. If the screening criteria are not met, a quantitative analysis, through site-specific dispersion modeling of project-related CO concentrations, would not be necessary. A project would not cause localized violations of the CAAQS for CO if the BAAQMD's CO screening criteria, summarized below, are met (BAAQMD 2023b).

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, the regional transportation plan, and local congestion management agency plans.
- Project-generated traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.

[8] The California Supreme Court's 2018 decision in *Sierra Club v. County of Fresno* (6 Cal.5th 502), also referred to as the Friant Ranch Decision, included review of the long-term regional air quality analysis contained in the environmental impact report (EIR) for the proposed Community Plan Update and Friant Ranch Specific Plan. The court found that the EIR's air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time."

- Project-generated traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

Particulate Matter

BAAQMD adopted an incremental $PM_{2.5}$ concentration-based significance threshold in which a "substantial" contribution at the project level for an individual source is defined as total (i.e., exhaust and fugitive) $PM_{2.5}$ concentrations exceeding 0.3 $\mu g/m^3$. In addition, BAAQMD considers projects to have a cumulatively considerable $PM_{2.5}$ impact if sensitive receptors are exposed to $PM_{2.5}$ concentrations from local sources within 1,000 feet, including existing sources, project-related sources, and reasonably foreseeable future sources, that exceed 0.8 $\mu g/m^3$ (BAAQMD 2023b). BAAQMD's $PM_{2.5}$ thresholds apply to both new receptors and new sources.

BAAQMD has not established PM_{10} thresholds of significance. Rather, BAAQMD considers impacts related to fugitive PM_{10} from earthmoving activities to be less than significant with application of BAAQMD's basic construction measures.

Diesel Particle Matter

DPM has been identified as a TAC. It is particularly concerning because long-term exposure can lead to cancer, birth defects, and damage to the brain and nervous systems. BAAQMD has adopted incremental cancer and hazard thresholds to evaluate receptor exposure to single sources of DPM emissions. The "substantial" DPM threshold defined by BAAQMD is exposure of a sensitive receptor to an individual emissions source, resulting in an excess cancer risk level of more than 10 in 1 million or a non-cancer (i.e., chronic or acute) hazard index greater than 1.0 (BAAQMD 2023b). BAAQMD also considers projects to have a cumulatively considerable DPM impact if they contribute to DPM emissions that, when combined with cumulative sources within 1,000 feet of sensitive receptors, result in excess cancer risk levels of more than 100 in 1 million or a hazard index greater than 10.0. BAAQMD considers projects to have a significant cumulative impact if they worsen an existing health risk impact at a location where the combined exposure to all cumulative sources, including all past, present, and foreseeable future sources, within 1,000 feet (or greater where appropriate) is in excess of cumulative thresholds (BAAQMD 2023b).

Asbestos

BAAQMD's 2022 CEQA Guidelines state that projects that have the potential to disturb asbestos (from soil or building material) must comply with all the requirements of CARB's ATCM for Construction, Grading, Quarrying, and Surface Mining Operations and BAAQMD Regulation 11, Rule 2: Asbestos Demolition, Renovation and Manufacturing (BAAQMD 2023b). As described above under *Regulatory Setting*, CARB's ATCM for Construction, Grading, Quarrying, and Surface Mining Operations requires work practices that minimize asbestos emissions from activities where naturally occurring asbestos is found or is likely to be found. BAAQMD Regulation 11, Rule 2, controls emissions of asbestos to the atmosphere during demolition, renovation, and transportation. The rule requires lead agencies and their contractors to notify BAAQMD of any regulated renovation or demolition activity and provide a description of structures and methods utilized to determine whether asbestos-containing materials are potentially present. In addition, Regulation 11, Rule 2, requires any asbestos-containing material found on a site to be removed prior to demolition or renovation, thereby minimizing the release of airborne asbestos emissions. Thus, projects that

comply with the requirements of CARB's ATCM for Construction, Grading, Quarrying, and Surface Mining Operations and BAAQMD Regulation 11, Rule 2 would not have a significant air quality impact with respect to asbestos emissions.

Odors

According to BAAQMD's 2022 CEQA Guidelines, odor impacts could occur if a project proposes a new odor source near existing receptors. BAAQMD recommends that projects identify the location of planned odor sources and include policies to reduce potential odor impacts on existing receptors and provides recommended screening distances for siting new receptors near existing odor sources.

Impacts

Impact AQ-1: Would the project conflict with or obstruct the implementation of the applicable air quality plan? (Less than Significant)

As described under *Regulatory Setting*, the current air quality attainment plan for the SFBAAB is BAAQMD's 2017 Clean Air Plan, which defines control strategies to reduce emissions and ambient concentrations of air pollutants; safeguards public health by reducing exposure to air pollutants that pose the greatest health risk, with an emphasis on protecting the communities most heavily affected by air pollution; and reduces GHG emissions to protect the climate (BAAQMD 2017a). According to the BAAQMD CEQA Guidelines, the determination of 2017 Clean Air Plan consistency should consider the following for project-level analyses (BAAQMD 2023b).

- Does the project support the primary goals of the 2017 Clean Air Plan?
- Does the project include all applicable control measures from the 2017 Clean Air Plan?
- Does the project disrupt or hinder implementation of any 2017 Clean Air Plan control measures?

Each of these questions is addressed below for the project.

Support of Clean Air Plan Goals

The primary goals of the *2017 Clean Air Plan* are to reduce emissions and decrease concentrations of harmful pollutants, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce GHG emissions and protect the climate.

The project includes numerous improvements that will support regional attainment of the CAAQS and NAAQS. Specifically, the project would develop an all-electric residential community, including electric water heating systems, resulting in lower emissions than if the project were to use energy generated by fossil fuel energy sources, consistent with the goals of the Clean Air Plan. The recreational fields would also have all-electric power. To support efforts to reduce emissions for transportation, each of the project's 155 single-family homes would have an attached garage with space for bicycle parking and equipped with one Level 2 electric vehicle (EV) Ready space and one Level 1 EV Ready space. The project thus encourages electric vehicle use, which facilitates the transition away from internal combustion vehicles and thus reduces emissions. In addition, each of the proposed 155 single-family homes would include solar panels; energy efficient electric appliances; windows; insulation; and heating, ventilation, and air conditioning (HVAC) systems, which are design features that would reduce onsite energy consumption. Finally, the project would take part in the Recology/San Bruno recycling and composting programs and develop the site with

drought-tolerant and/or native landscaping and water-conserving irrigation systems including climate-sensitive controllers in common areas.

Based on the above analysis, the proposed project would support the primary goals of the *2017 Clean Air Plan* because it would reduce criteria pollutant and GHG emissions, relative to a typical development project, by facilitating the use of non-fossil fuel energy sources (i.e., onsite and grid-supplied renewable electricity and EVs). The reduction in emissions would also help to safeguard public health because there would be no harmful emissions from natural gas use, and the EV chargers would encourage the use of vehicles free from combustion emissions.

Include Applicable Clean Air Plan Control Measures

Control strategies in the Clean Air Plan include measures in the following categories: Stationary-Source Control Measures, Transportation Control Measures, Energy Control Measures, Building Control Measures, Agriculture Control Measures, Natural and Working Lands Control Measures, Waste Management Control Measures, and Water Control Measures. The project's consistency with each of these strategies is discussed below.

Stationary-Source Control Measures

The stationary-source control measures, which are designed to reduce emissions from stationary sources such as metal melting facilities, cement kilns, refineries, and glass furnaces, are incorporated into rules adopted by BAAQMD and then enforced by BAAQMD permit and inspection programs. Because the project does not propose the operation of any stationary sources, such as emergency generators, the stationary-source control measures from the Clean Air Plan are not applicable to the project.

Transportation Control Measures

As part of the Clean Air Plan, BAAQMD identifies transportation control measures to decrease emissions of criteria pollutants, TACs, and GHGs by reducing demand for motor vehicle travel, promoting efficient vehicles and transit service, decarbonizing transportation fuels, and electrifying motor vehicles and equipment.

The project would support efforts to electrify motor vehicles, as each of the project's 155 single-family homes would have an attached garage equipped with one Level 2 EV Ready space and one Level 1 EV Ready space, thus going beyond the requirements of the most ambitious voluntary standard in the current California Green Building Standards Code (CALGreen Tier 2).

The *2017 Clean Air Plan* also recognizes that community design dictates individual travel mode and that a key long-term control strategy to reduce emissions of criteria pollutants, TACs, and GHGs from motor vehicles is to channel future Bay Area growth into vibrant urban communities where goods and services are close at hand and people have a range of viable transportation options.

As described in Section 3.7, *Greenhouse Gas Emission,* the residential component of the project would support the achievement of a more balanced distribution of jobs and housing across the region by siting new residential dwellings in San Mateo County, where there are currently more jobs than housing, thus making it possible for more people to live near their workplaces (MTC/ABAG 2021).

Given these characteristics, the project would promote BAAQMD initiatives to electrify motor vehicles and equipment and reduce demand for motor vehicle travel through community design. Therefore, the project would be consistent with the applicable transportation control measures of the Clean Air Plan.

Energy Control Measures

The Clean Air Plan also includes energy control measures, which are designed to reduce emissions by decreasing the amount of electricity consumed in the Bay Area as well as the carbon intensity of electricity used by switching to less GHG-intensive fuel sources for electricity generation. Because these measures apply to electrical utility providers and local government agencies, and not individual projects, the energy control measures of the Clean Air Plan are not applicable to the project.

While the energy control measures of the Clean Air Plan are not applicable to the project, the project would nonetheless support efforts to switch to less GHG-intensive fuel sources and minimize electricity consumption through energy-efficient design. Specifically, the project would be an all-electric residential community and recreational facility, thereby reducing reliance on natural gas and increasing reliance on renewable energy. In addition, each of the proposed 155 single-family homes would include solar panels, energy efficient electric appliances, windows, insulation, and HVAC systems—design features that would reduce onsite energy consumption.

Building Control Measures

BAAQMD has authority to regulate emissions from certain sources in buildings, such as boilers and water heaters, but has limited authority to regulate buildings themselves. Therefore, the strategies in the control measures for this sector focus on working with local governments that do have authority over local building codes to facilitate adoption of BMPs and policies related to GHGs. Therefore, the building control measures of the Clean Air Plan are not applicable to the project.

While the building control measures of the Clean Air Plan are not applicable to the project, the project would nonetheless support efforts to reduce emissions from buildings by developing an all-electric residential community and recreational facility, including electric water heating systems, with energy-conserving design features, as described above. In addition, the project would develop the site with drought-tolerant and/or native landscaping, water-conserving irrigation systems including climate-sensitive controllers in common areas, and biological treatment of stormwater runoff. Finally, as described above, each garage would be equipped with one Level 2 EV Ready space and one Level 1 EV Ready space, as well as bicycle parking to allow an alternative mode of transit for residents.

Agriculture Control Measures

The agriculture control measures are designed to reduce primarily emissions of methane. Because the project would not include any agricultural activities, the agriculture control measures of the Clean Air Plan are not applicable to the project.

Natural and Working Lands Control Measures

The natural and working lands control measures focus on increasing carbon sequestration on rangelands and wetlands. They also encourage local governments to adopt ordinances that promote

urban tree planting. Because the project would not directly disturb rangelands or wetlands and urban tree planting would be a citywide, City-led effort, the natural and working lands control measures of the Clean Air Plan are not applicable to the project.

Waste Management Control Measures

The waste management control measures focus on reducing or capturing methane emissions from landfills and composting facilities, diverting organic materials away from landfills, and increasing waste diversion rates through efforts to reduce, reuse, and recycle.

The project would take part in the Recology/San Bruno recycling and composting programs. Therefore, the project would be consistent with the waste management control measures of the Clean Air Plan.

Water Control Measures

The water control measures focus on reducing emissions of criteria pollutants, TACs, and GHGs by encouraging water conservation, limiting GHG emissions from publicly owned treatment works, and promoting the use of biogas recovery systems. Because these measures apply to publicly owned treatment works and local government agencies, and not individual projects, the water control measures are not applicable to the project.

While the water control measures of the Clean Air Plan are not applicable to the project, the project would nonetheless support water conservation efforts by developing the site with drought-tolerant and/or native landscaping, water-conserving irrigation systems including climate-sensitive controllers in common areas, and biological treatment of stormwater runoff, as described above.

Disrupt or Hinder Implementation of 2017 Clean Air Plan Control Measures

As discussed above, the project would incorporate a variety of sustainable design features to reduce air pollutant emissions associated with transportation, energy, buildings, waste generation, and water usage. As a result, the project would not disrupt, delay, or otherwise hinder implementation of any applicable control measure from the 2017 Clean Air Plan. Rather, the project would support and facilitate implementation. The variant would have the same components as described for the proposed project and would therefore also support and facilitate implementation. Accordingly, the proposed project and variant would not fundamentally conflict with the 2017 Clean Air Plan or its measures. The impact would be **less than significant**.

Impact AQ-2: Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard? (Less than Significant with Mitigation)

According to the BAAQMD CEQA Guidelines, to meet air quality standards for criteria air pollutant and air precursor impacts, projects must not generate construction or operational emissions in excess of the thresholds shown in Table 3.2-5, above. The project's construction and operational emissions are evaluated in this section.

Construction

Construction activities for both the residential and recreational uses would generate emissions in the form of exhaust from off-road equipment; exhaust from employee vehicles, vendor trucks, and haul trucks; fugitive dust from site grading and earthmoving; suspended road dust from vehicle travel; and off-gassing from architectural coatings and paving. Construction equipment and activities for the project variant would be the same as the proposed project. The amount generated on a daily basis would vary, depending on the intensity and types of construction activities occurring simultaneously. Consistent with BAAQMD guidance, average daily emissions have been calculated to assess construction impacts (BAAQMD 2023b). The average daily criteria air pollutant emissions that would be generated during project construction are shown in Table 3.2-6 for an unmitigated scenario. Appendix B, *Air Quality and Greenhouse Gas Emissions*, contains air quality modeling input parameters, output files, and model assumptions.

Table 3.2-6. Estimated Unmitigated Average Daily Construction Emissions of Criteria Air Pollutants and Precursors

	Average Daily Emissions (lbs/day)[a]			
Construction Year	**ROG**	**NO_X**	**PM_{10} Exhaust**	**$PM_{2.5}$ Exhaust**
2024	<1	<1	<1	<1
2025	9	10	<1	<1
2026	7	3	<1	<1
Average Daily Emissions for All Years	**9**	**10**	<1	<1
BAAQMD Significance Thresholds	54	54	82	54
Exceeds Threshold?	**No**	**No**	**No**	**No**

[a] BAAQMD construction thresholds for PM_{10} and $PM_{2.5}$ evaluate only exhaust emissions.
lbs/day = pounds per day
Source: Appendix B, *Air Quality and Greenhouse Gas Emissions*.

As shown in Table 3.2-6, the project's estimated unmitigated average daily construction emissions for ROG, NO_X, and exhaust PM_{10} and $PM_{2.5}$ would not exceed the BAAQMD thresholds. Therefore, construction of the project would not result in a cumulatively considerable net increase in criteria air pollutants for which the SFBAAB is designated as a nonattainment area with respect to the federal or state ambient air quality standards. For both the proposed project and the variant, this impact would be considered **less than significant**.

Project construction activities, such as demolition, rough grading, and material hauling, would generate fugitive dust emissions (i.e., $PM_{2.5}$ and PM_{10}). As noted in BAAQMD's 2022 CEQA Guidelines, projects implementing the BAAQMD-recommended basic BMPs for construction-related fugitive dust emissions are considered to have a less-than-significant criteria air pollutant impact related to construction-generated fugitive dust emissions (BAAQMD 2023b). As such, before the inclusion of feasible BAAQMD-identified BMPs, the proposed project's construction-generated fugitive dust emissions would be considered **significant**, and mitigation would be required.

Mitigation Measure AQ-1: Require Implementation of BAAQMD Basic Best Management Practices for Construction-Related Fugitive Dust Emissions.

The project sponsors shall require their contractors, as a condition of contracts (e.g., standard specifications), to reduce construction-related fugitive dust emissions by implementing BAAQMD's basic BMPs, including (but not limited to) the following measures.

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material offsite shall be covered.
- All visible mud or dirt trackout onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.
- All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
- Unpaved roads providing access to sites located 100 feet or farther from a paved road shall be treated with a 6- to 12-inch layer of compacted wood chips, mulch, or gravel.
- Publicly visible signs shall be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number shall also be visible to ensure compliance with applicable regulations.

For the residential component of the project, the project sponsor shall submit evidence of compliance to the City prior to grading permit issuance. For the recreational component, the City shall document compliance by its contractor.

Mitigation measure AQ-1 requires the implementation of BAAQMD's basic BMPs. Thus, implementation of mitigation measure AQ-1 would reduce this impact to a less-than-significant level, and both the project and variant's impact with respect to construction-generated fugitive dust emissions would be **less than significant with mitigation**.

Recreational Site

Field improvements and the development of potential recreational amenities could result in emissions from grading, installing turf and field lighting, and minor paving or construction activities for recreational amenities. The emissions estimates in Table 3.2-6 for the residential component include rough grading activities necessary for the recreational site, which are expected to be the most emissions-intensive portion associated with development of the recreational site. As shown in Table 3.2-6, construction activities for the residential component, including rough grading within the recreational site, would be well below the applicable BAAQMD thresholds.

Given that the City design process of the recreational component is in progress, so that the precise scheduling of construction phases cannot currently be known, it would be speculative to quantify other potential sources of emissions resulting from construction of the recreational site. Instead, four projects proposing comparable but more intensive kinds of components and construction were identified to provide a worst-case evaluation of emissions resulting from potential construction activities within the recreational site for the City's development. This evaluation represents a conservative analysis, as any potential development activities within the recreational site are expected to be less intensive than the development proposed under the example projects. Table 3.2-7 shows the components and estimated emissions associated with construction of the example projects.

Table 3.2-7. Emissions from Example Recreational Site Improvement Projects

Example Project	Project Components	Emissions[a]			
		ROG	NO_X	PM_{10}	$PM_{2.5}$
Sonoma Valley HS Athletic Fields Renovation Project, 2019 (BAAQMD)[a]	New Track & Field facility, including seating, team rooms, storage, restrooms, and concession buildings. New and/or modernized fields for softball and Junior Varsity baseball. Relocation of the basketball courts.	0.7	7.2	0.4	0.3
Highlands High School Sports Complex Project, 2021 (SMAQMD)[b]	Replace the existing natural grass field and earthen track with synthetic turf and synthetic track surface. Install five LED light poles. Construct a 1,620-square-foot, one-story modular building containing a concession stand, and restrooms, eight 8-foot-high portable bleacher structures with seating for approximately 496 spectators, shotput area, and a small parcourse area. Install a scoreboard, new walkways, landscaping, and 1,467 linear feet of fencing up to 6 feet in height.	0.5	4.5	0.2	0.2
Monterey HS Stadium Improvements Project, 2020 (MBARD)[c]	Grade and create a softball field (2.2 acres) with synthetic turf Install stadium lights at existing football field. Install new visitor bleachers at football field. Construct new team weight room and press box.	2.4	25.1	1.2	1.1
Corona Del Mar MS/HS Sports Field Project, 2017 (SCAQMD)[d]	Replace and reconfigure the existing natural-turf field and rubber track with synthetic-turf field and track. Construct 1,000-seat capacity bleachers, a press-box, public address (PA) system, and nighttime lighting with four 80-foot poles. Construct a 3,000-square-foot building with two ticket booths, two restroom areas, a main concession area, and storage.	3.0	30.0	4.0	3.0

[a] Average daily emissions were calculated by subtracting grading emissions from the estimated average annual emissions associated with the highest-emitting construction year and converting to pounds per day.

[b] Average daily emissions were calculated by converting the estimated average annual emissions to pounds per day.

[c] Maximum daily emissions were calculated by subtracting grading emissions from the estimated maximum daily emissions associated with the highest-emitting construction year.

[d] The values in the table represent the estimated maximum daily emissions from the highest-emitting phase of construction, not including grading or demolition.
Sources: Sonoma Valley Unified School District 2019a. 2019b; Monterey Peninsula Unified School District 2020a, 2020b; Newport-Mesa Unified School District 2017; Twin Rivers Unified School District 2021.
SMAQMD = Sacramento Metropolitan Air Quality Management District; MBARD = Monterey Bay Air Resources District.

As shown in Table 3.2-7, average daily emissions range from 0.5 to 0.7 pounds per day for ROG, 4.5 to 7.2 pounds per day for NO_X, 0.2 to 0.4 pounds per day for PM_{10} exhaust, and 0.2 to 0.3 pounds per day for $PM_{2.5}$ exhaust among the representative projects. Maximum daily emissions ranged from 2 to 3 pounds per day for ROG, 25 to 30 pounds per day for NO_X, 1 to 4 pounds per day for PM_{10} exhaust, and 1 to 3 pounds per day for $PM_{2.5}$ exhaust.

Average daily emissions associated with the residential component, including demolition and rough grading for the recreational site, were summed with the highest maximum daily emissions from the example projects to account for other potential construction activities necessary for the recreational site, as shown in Table 3.2-8.

Table 3.2-8. Combined Emissions from Residential Component and Example Recreational Projects

Example Project	Emissions (lbs/day)[a]			
	ROG	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
Residential Component[b] (Average Daily)	9	10	<1	<1
Recreational Component[c] (Maximum Daily)	3	30	4	3
Worst-Case Daily Emissions	**12**	**40**	**4**	**3**
BAAQMD Significance Thresholds[d]	54	54	82	54
Exceeds Threshold?	**No**	**No**	**No**	**No**

[a] BAAQMD construction thresholds for PM_{10} and $PM_{2.5}$ evaluate only exhaust emissions.
[b] Average daily emissions from the highest-emitting year of construction for the residential component, including grading for the recreational site.
[c] Maximum daily emissions from the highest-emitting example recreational project.
[d] Note that this represents a conservative analysis, as BAAQMD recommends comparing average daily emissions to applicable mass emissions thresholds.
lbs/day = pounds per day.

As shown in Table 3.2-8, combined emissions from the residential component and highest-emitting example recreational project would not exceed the BAAQMD average daily emissions thresholds. Moreover, activities associated with the recreational site would be less emissions-intensive than those evaluated for the residential component (i.e., construction of 155 homes, utility trenching, street paving, installation of other infrastructure) because it would involve construction of just one small building (restrooms/concession stand), paving of a small parking area, fine grading, and turf and lighting installation). The residential component resulted in emissions well below BAAQMD thresholds, such that even doubling its emissions would still be below the significance threshold. As activities within the recreational site would be less emissions-intensive than those necessary for the residential component, and emissions would not exceed the BAAQMD thresholds even when incorporating worst-case emissions estimates prepared for more intensive (but comparable in type of use and construction activities) projects, development of the recreational site would not result in a cumulatively considerable net increase in criteria air pollutants for which the SFBAAB is designated as a nonattainment area with respect to the federal or state ambient air quality

standards. For both the proposed project and the variant, this impact would be considered **less than significant**.

Consistent with the analysis of fugitive dust emissions for the residential component, fugitive dust emissions resulting from development of the recreational site would be considered **significant** before the inclusion of feasible BAAQMD-identified BMPs, and mitigation would be required. Implementation of mitigation measure AQ-1, which requires the implementation of BAAQMD's basic BMPs, would reduce this impact to a less-than-significant level. Thus, both the project and variant's impact with respect to construction-generated fugitive dust emissions from the recreational site would be **less than significant with mitigation**.

Operation

Operation of the residential uses would generate long-term air pollutant emissions from motor vehicles traveling to and from the project site and landscape maintenance equipment as well as long-term air pollutant emissions from area sources, including cleaning supplies and architectural coatings. The proposed project would not result in any direct building energy emissions because the residences would be all-electric and no natural gas infrastructure would be constructed. Operational activities for the project variant would be the same as the proposed project.

The estimated unmitigated daily operational emissions for conservative full buildout year 2026 emissions are presented in Table 3.2-9 and compared to BAAQMD's recommended mass emission thresholds. Appendix B, *Air Quality and Greenhouse Gas Emissions*, contains the assumptions used in the modeling and air quality emissions calculations.

Table 3.2-9. Estimated Unmitigated Average Daily Operational Emissions

	Average Daily Emissions (lbs/day)			
Emissions Source	**ROG**	**NO_X**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Mobile Sources	4	3	9	2
Area Sources	10	<1	<1	<1
Energy Sources	-	-	-	-
Total – Proposed Project	14	3	9	2
BAAQMD Significance Threshold	54	54	82	54
Exceeds Threshold?	**No**	**No**	**No**	**No**

[a] BAAQMD operational thresholds for PM_{10} and $PM_{2.5}$ include both fugitive dust and exhaust emissions.
Notes:
Modeling files are provided in Appendix B, *Air Quality and Greenhouse Gas Emissions*.
Individual rows may not add up to the totals shown due to rounding.
lbs/day = pounds per day

As shown in Table 3.2-9, the project's estimated unmitigated average daily operational emissions would not exceed the BAAQMD thresholds. Therefore, project operations would not result in a cumulatively considerable net increase in criteria air pollutants for which the SFBAAB is designated as a nonattainment area with respect to the federal or state ambient air quality standards. For both the proposed project and the variant, this impact would be considered **less than significant**.

Recreational Site

Operation of the fields and potential recreational amenities could result in emissions from vehicle trips traveling to and from the site, landscape maintenance equipment, use of cleaning supplies, and application of architectural coatings. The project would not result in any direct building energy emissions because no natural gas infrastructure would be constructed. The emissions estimates in Table 3.2-9 for the residential component include emissions resulting from the use of landscape maintenance equipment and consumer products at the recreational site, as well as vehicle trips traveling to and from the site.[9] As shown in Table 3.2-9 above, operational activities, including the vehicle trips traveling to and from the site and use of landscape maintenance equipment and consumer products within the recreational site, would generate emissions well below the applicable BAAQMD thresholds.

Localized Carbon Monoxide Hot Spots

Continuous engine exhaust may elevate localized CO concentrations, resulting in hot spots. Receptors exposed to these CO hot spots may have a greater likelihood of developing adverse health effects. CO hot spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations.

Peak-hour traffic volumes at all roadways in the vicinity were analyzed to determine whether CO emitted by project-generated traffic would exceed the BAAQMD screening criteria. Based on data provided by Fehr & Peers, the maximum peak hour traffic volume at an affected intersection would be 2,414 vehicles per hour. Thus, maximum traffic volumes at the affected intersections would be far less than BAAQMD's recommended screening criterion of 44,000 vehicles per hour, as well as the screening criterion of 24,000 vehicles per hour that BAAQMD recommends for areas where vertical and/or horizontal mixing is substantially limited. In addition, the TDM requirements of the City/County Association of Government's Congestion Management Plan are not applicable to single-family residential projects, such as the proposed project. As a result, the project would not exceed BAAQMD's screening criteria for local CO hot spots, and the project can be assumed not to result in, or contribute to, a localized concentration of CO that would exceed the applicable NAAQS or CAAQS. For both the proposed project and the variant, this impact would be considered **less than significant**.

Regional Health Impacts of Criteria Air Pollutants

Adverse health effects induced by regional criteria pollutant emissions generated by the project (ozone precursors and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). Ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale. Emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollution may be transported over long distances or formed through atmospheric reactions. As such, the magnitudes and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous

[9] As described in Section 3.15, *Transportation*, because the number and timing of trips associated with the recreation/open space area is already captured in background trips, the recreation/open space area was not added into the travel demand analysis. The analysis in this EIR represents the level of recreation activity expected, based on existing and past use, and is a conservative analysis from a vehicle miles traveled (VMT) perspective.

sources throughout a region, as opposed to a single individual project. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an adverse health effect—as discussed above, there are large individual differences in the intensity of symptomatic responses to air pollutants. These differences are influenced, in part, by the underlying health condition of an individual, which cannot be known.

Models and tools have been developed to correlate regional criteria pollutant emissions to potential community health impacts. While there are models capable of quantifying ozone and secondary PM formation and associated health effects, these tools were developed to support regional planning and policy analysis and have limited sensitivity to small changes in criteria pollutant concentrations induced by individual projects.

As discussed above, BAAQMD's regional thresholds consider existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants. Although BAAQMD recognizes that air quality is a cumulative problem, it considers projects that generate criteria pollutant and O_3 precursor emissions that fall below the thresholds to be minor in nature; therefore, such projects would not adversely affect air quality to the extent that the health-protective NAAQS or CAAQS would be exceeded.

As shown in Tables 3.2-6 and 3.2-7, project construction and operation would not generate regional criteria pollutants in excess of applicable BAAQMD thresholds. As such, the project would not be expected to contribute a significant level of air pollution that would degrade air quality within the SFBAAB. Consequently, regional health impacts from criteria pollutant emissions generated by the proposed project or the variant would be **less than significant**.

Impact AQ-3: Would the project expose sensitive receptors to substantial pollutant concentrations? (Less than Significant)

Sensitive land uses are generally considered to include those land uses where exposure to pollutants could result in health-related risks to sensitive individuals. As described above, the nearest offsite sensitive land uses are the residences located west of the project site. The primary pollutants of concern for health risks for sensitive receptors are asbestos, DPM, and localized $PM_{2.5}$. Note that asbestos presents a health risk concern to any person exposed, whether or not they are considered a sensitive individual. This impact differs from Impact AQ-2 because Impact AQ-2 evaluates regional health impacts, while this impact discussion evaluates local health impacts.

Toxic Air Contaminants

Asbestos

Asbestos is a naturally occurring mineral that was previously used in building construction because of its heat resistance and strong insulating properties. Exposure to asbestos, however, has been shown to cause many disabling and fatal diseases, including lung cancer, mesothelioma, and pleural plaques. The potential for naturally occurring asbestos on site is low, and demolition of the existing hardscape (asphalt and concrete) and buildings on the project site may expose workers and nearby receptors to asbestos if the material was used during construction of the original hardscape and buildings. However, the project would comply with CARB's ATCM for Construction, Grading, Quarrying, and Surface Mining Operations and BAAQMD Regulation 11, Rule 2: Asbestos, Demolition, Renovation, and Manufacturing. Because the proposed project and the variant would be

required to control asbestos emissions according to applicable CARB and BAAQMD regulations, receptors would not be exposed to substantial asbestos risks, and impacts associated with asbestos emissions would be **less than significant.**

Diesel Particulate Matter and Localized $PM_{2.5}$

DPM is a carcinogen contained in the exhaust of diesel internal-combustion engines. Project-related construction activities would generate DPM (i.e., PM_{10} exhaust from diesel vehicles)[10] from off-road equipment, onsite trucks, and on-road travel of heavy-duty trucks. PM_{10} exhaust and fugitive dust emissions would be generated from off-road equipment, onsite soil movement, onsite trucks, and on-road travel of heavy-duty trucks and worker vehicles.

Health impacts from exposure to DPM include cancer risks and chronic non-cancer risks. The HRA for the project includes an evaluation of annual concentrations of PM_{10} from exhaust and $PM_{2.5}$ from fugitive dust sources.

As discussed in Impact AQ-2, the unmitigated emissions generated by project construction and operation would not exceed the applicable BAAQMD thresholds. Therefore, the project's estimated unmitigated emissions were used to estimate health risks impacts at offsite sensitive receptors. Table 3.2-10 presents the maximum unmitigated health risks resulting from project-generated DPM and $PM_{2.5}$ emissions at analyzed sensitive receptor locations.

Table 3.2-10. Estimated Unmitigated Project-Level Health Risk Results from Modeled Scenarios

Offsite Receptor Type	Cancer Risk (cases per million)	Non-Cancer Chronic Risk	Annual $PM_{2.5}$ Concentrations ($\mu g/m^3$)
Maximally Exposed Individual (DPM)	2.7	0.003	--
Maximally Exposed Individual ($PM_{2.5}$)	--	--	0.1
BAAQMD Significance Threshold	10.0	1.0	0.3
Exceeds Threshold?	**No**	**No**	**No**

As shown in Table 3.2-10, the project's estimated cancer risk, chronic hazard index, and annual $PM_{2.5}$ concentration would be below applicable BAAQMD significance thresholds at the maximally exposed individual receptor locations. Thus, the project would not expose sensitive receptors to substantial pollutant concentrations resulting in significant health risk impacts. For both the proposed project and the variant, this impact would be considered **less than significant**.

Recreational Site

Construction of the fields and potential recreational amenities could result in DPM and $PM_{2.5}$ emissions from grading, installing turf and field lighting, and minor paving or construction activities for recreational amenities. The health risks in Table 3.2-10 for the residential component include rough grading activities necessary for the recreational site. However, as specific parameters and characteristics of the sports fields are currently under development, as discussed above, the City has no specific construction scheduling and activity information at this time.

As shown in Table 3.2-10, health risks associated with construction of the residential component, including rough grading for the recreational site, would be well below the applicable BAAQMD

[10] Per BAAQMD guidance, PM_{10} exhaust is used as a surrogate for DPM.

thresholds. Note that rough grading is expected to be the most emissions-intensive activity necessary for development of the recreational site. Compared to grading activities for the recreational site and construction activities for the residential component, emissions and associated health risks resulting from other activities necessary for the recreational site, such as installing turf and field lighting and minor paving or construction activities for recreational amenities, are expected to be more minor and shorter in duration.

Moreover, the maximally impacted receptors for health risks associated with DPM and $PM_{2.5}$ resulting from construction of the residential component and grading of the recreational site would be located approximately 1,200 feet from the southwestern border of the recreational site. DPM and $PM_{2.5}$ emissions resulting from the development of the recreational site would thus disperse substantially. Per BAAQMD's *Health Risk Calculator with Distance Multipliers*, risks from diesel internal combustion engines decrease by approximately 96 percent at a distance of 919 feet, the greatest distance for which a distance adjustment multiplier is provided (BAAQMD 2022b).

Given that (1) health risks associated with construction of the residential component and grading of the recreational site would be well below the applicable BAAQMD thresholds, (2) emissions and associated health risks resulting from recreational site activities other than grading would be minor and brief, and (3) health risks resulting from recreational site activities would decrease substantially over the distance to the maximally impacted receptors (more than 1,000 feet), development of the recreational site would not expose sensitive receptors to substantial pollutant concentrations resulting in significant health risk impacts. For both the proposed project and the variant, this impact would be considered **less than significant.**

Impact AQ-4: Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? (Less than Significant)

As discussed above, odor impacts could occur if a project proposes a new odor source near existing receptors. There are many sensitive receptors within 1,000 feet of the project site. Potential odor emitters during construction activities include diesel exhaust, asphalt paving, and the use of architectural coatings and solvents. Construction-related activities would be temporary, and construction activities would not be likely to result in nuisance odors that would violate BAAQMD Regulation 7. Odors during operation could result from vehicle exhaust and the reapplication of architectural coatings. These odors would be limited to areas adjacent to the building. Although such brief exhaust- and paint-related odors may be considered adverse, they would not affect a substantial number of people. Neither the proposed project nor the variant proposes any changes that would include odor-generating facilities. Therefore, odor impacts for the proposed project and the variant would be **less than significant**.

3.3 Biological Resources

This section evaluates the project's potential environmental impacts on biological resources. It first describes the existing biological resources in the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.3.1 Existing Conditions

Regulatory Setting

Federal

Federal Endangered Species Act

Pursuant to the federal Endangered Species Act (ESA) (16 United States Code, Title 16, Section 1531 et seq.), the U.S. Fish and Wildlife Service (USFWS) regulates the taking of species listed in the ESA as threatened or endangered. In general, persons subject to ESA (including private parties) are prohibited from "taking" endangered or threatened fish and wildlife species on private property, and from "taking" endangered or threatened plants in areas under federal jurisdiction or in violation of state law. Under Section 9 of the ESA, the definition of "take" is to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." USFWS has also interpreted the definition of "harm" to include significant habitat modification that could result in take. Section 10 of the ESA applies if a nonfederal agency is the lead agency for an action that results in take and no other federal agencies are involved in permitting the action. Section 7 of the ESA applies if a federal discretionary action is required (e.g., a federal agency must issue a permit), in which case the involved federal agency consults with USFWS.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, provides for protection of international migratory birds and authorizes the Secretary of the Interior to regulate the taking of migratory birds. The MBTA provides that it will be unlawful, except as permitted by regulations, to pursue, take, or kill any migratory bird, or any part, nest, or egg of any such bird. Under the MBTA, "take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities." A take does not include habitat destruction or alteration, as long as there is not a direct taking of birds, nests, eggs, or parts thereof. The current list of species protected by the MBTA can be found in Title 50 of the Code of Federal Regulations, Section 10.13. The list includes nearly all birds that are native to the United States.

State

California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA), a permit from California Department of Fish and Wildlife (CDFW) is required for projects that could result in the "take" of a plant or animal

species that is listed by the state as threatened or endangered. Under CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species but does not include "harm" or "harass," as does the federal definition. As a result, the threshold for take is higher under CESA than under the federal ESA. Authorization for take of state-listed species can be obtained through a California Fish and Game Code Section 2081 incidental take permit.

California Fish and Game Code Sections 3503 and 3503.5—Protection of Bird Nests and Raptors

Section 3503 of the Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird. Section 3503.5 of the California Fish and Game Code states that it is unlawful to take, possess, or destroy any raptors (i.e., species in the orders Falconiformes and Strigiformes), including their nests or eggs. Typical violations include destruction of active nests as a result of tree removal or disturbance caused by project construction or other activities that cause the adults to abandon the nest, resulting in loss of eggs and/or young.

Fully Protected Species (California Fish and Game Code)

A fully protected species is one that cannot be taken or possessed at any time. Protection of fully protected species is described in Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code. These sections of the code prohibit take or possession of fully protected species and do not provide for authorization of incidental take. Senate Bill 147 was signed into law on July 10, 2023, to amend the fully protected species statutes and create a temporary 10-year period where proponents of a limited set of activities can receive project approval even if there could be take of fully protected species.

Local

City of San Bruno General Plan

The San Bruno General Plan contains several policies directly or indirectly related to biological resources and the project, including the following.

- **ERC-5:** Preserve critical habitat areas and sensitive species within riparian corridors, hillsides, canyon areas, tree canopies, and wetlands that are within the City's control. Protect declining or vulnerable habitat areas from disturbance during design and construction of new development.
- **ERC-9:** Preserve mature trees and vegetation, including wildflowers, within open canyon areas and along the city's scenic roadways.
- **ERC-10:** Require incorporation of native plants into landscape plans for new development as feasible— especially in areas adjacent to natural areas, such as canyons or scenic roadways Require preservation of mature trees, as feasible, during design and construction.
- **ERC-11:** Prohibit the use of any new non-native invasive plant species in any landscaped or natural area. Develop a program for abatement of non-native invasive species in open space or habitat areas.
- **ERC-16**: Conduct presence/absence biological surveys for sensitive plant and animal species in natural areas prior to any construction activities proposed adjacent to or within identified natural areas. If no special status species are detected during these surveys, then construction-related activities may proceed. If listed special status species are found with the construction zone, then avoid these species and their habitat or consult with U.S. Fish and Wildlife Service and/or California Department of Fish and Game.

- **ERC-17:** If construction activities, including tree removal activities, are required adjacent to or within natural areas, then avoid activities during March through June unless a bird survey is conducted to determine that the tree is unused during the breeding season by avian species that are protected under California Fish and Game Codes 3503, 3503.5, and 3511.

San Bruno Tree Ordinance

Chapter 8.25 of the San Bruno Municipal Code contains the city's heritage tree ordinance. The ordinance defines a heritage tree as follows.

- Any native bay (*Umbellularia californica*), buckeye (*Aesculus species*), oak (*Quercus* species), redwood (*Sequoia sempervirens*), or pine (*Pinus radiata*) tree that has a diameter of six inches or more measured at fifty-four inches above natural grade;
- Any tree or stand of trees designated by resolution of the city council to be of special historical value or of significant community benefit;
- A stand of trees, the nature of which makes each dependent on the others for survival; or
- Any other tree with a trunk diameter of ten inches or more, measured at fifty-four inches above natural grade.

Per section 8.25.030, any person who wishes to remove or prune any heritage tree from any parcel of property is required to obtain a tree removal permit. Section 8.25.050(B) of the ordinance also outlines general reforestation requirements.

> Trees removed with a valid tree removal permit shall be replaced in accordance with the recommendation of the director of public works or designee. Replacement recommendations shall be formulated on the basis of location, condition, value, age, and reasons for tree removal. Tree replacement shall be a minimum of either two twenty-four-inch box size trees, or one thirty-six-inch box size tree, for each heritage tree removed, to be determined by the director of public works or designee[.]

Section 8.25.050(D) describes the path for compliance in the case that replanting is not feasible.

> Where the director of public works or designee determines that replanting is not feasible and/or appropriate, e.g., sufficient trees exist on site, conflicts with utilities, the director may require that a payment of equal value to the cost of the purchase and installation of the replacement tree(s) be made to the city tree planting fund.

Environmental Setting

Vegetation

Developed areas, including school grounds, comprise approximately 24 acres of the project area and include buildings, walkways, roadways, parking areas, grass fields, maintenance yards, storage facilities, and several mature landscape trees and bushes (e.g., deodar cedar [*Cedrus deodara*] and London plane tree [*Platanus* × *hispanica*]). Mixed pine eucalyptus forest is located along the margins of the project area, primarily on slopes, and is dominated by an overstory of Monterey pine (*Pinus radiata*) and red gum (*Eucalyptus camaldulensis*) with a dense understory of poison oak (*Toxicodendron diversilobum*) and Cushing manzanita (*Arctostaphylos glandulosa* subsp. *cushingiana*). Ruderal grassland is generally located in the margin between the developed and forested habitats and is dominated by ruderal grasses and forbs including Italian rye grass (*Festuca perennis*) and ripgut brome (*Bromus diandrus*).

Common Wildlife Species

Given the site's location within urbanized lands, typical urban mammals such as raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), native gray fox (*Urocyon cinereoargenteus,* (nonnative) red fox (*Vulpes vulpes*), coyotes (*Canis latrans*), and feral and domestic cats (*Felis catus*) and dogs (*Canis lupus familiaris*) would be expected to occur on site. The proximity to the Santa Cruz mountains may enable species such as the western grey squirrel (*Sciurus griseus*), striped skunk (*Mephitis mephitis*), and bobcat (*Lynx rufus*) to access the site from time to time. Some onsite structures and forested areas could be utilized as roosting habitat and/or nesting habitat by some bird and bat species.

Sensitive Biological Resources

Special-Status Species

Special-status species are defined as species that are legally protected or that are otherwise considered sensitive by federal, state, or local resource agencies. Special-status species are species, subspecies, or varieties that fall into one or more of the following categories, regardless of their legal or protection status.

- Species listed or candidates for listing by the State of California as threatened or endangered under CESA (14 California Code of Regulations [CCR] Section 670.5).
- Species identified by CDFW as Species of Special Concern. The term "California species of special concern" is applied by CDFW to animals not listed under ESA or CESA, but that are considered to be declining at a rate that could result in listing, or that historically occurred in low numbers and known threats to their persistence currently exist.
- Species listed as Fully Protected under the California Fish and Game Code (Section 3511 for birds, Section 4700 for mammals, Section 5050 for reptiles and amphibians, and Section 5515 for fish). CDFW's fully protected status was California's first attempt to identify and protect animals that were rare or facing extinction. Most species listed as fully protected were eventually listed as threatened or endangered under CESA; however, some species remain listed as fully protected but do not have simultaneous listing under CESA. Fully protected species may not be taken or possessed at any time and no take permits can be issued for these species except for scientific research purposes or for relocation to protect livestock.
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.).
- Species afforded protection under local or regional plans, policies, or ordinances.
- Plants considered by CDFW to be "rare, threatened or endangered in California" (California Rare Plant Ranks of 1A, presumed extinct in California and either rare or extinct elsewhere; 1B, considered rare or endangered in California and elsewhere; 2A, presumed extinct in California but common elsewhere; and 2B, considered rare or endangered in California but more common elsewhere). Note, that while these rankings do not afford the same type of legal protection as ESA or CESA, the uniqueness of these species requires special consideration under Section 15380 of the California Environmental Quality Act (CEQA) Guidelines (14 CCR Section 15000 et seq.); or taxa (i.e., taxonomic category or group) that otherwise meet the definition of rare or endangered under Section 15380 of the State CEQA Guidelines (14 CCR Section 15000 et seq.).

Appendix C, *Biological Resources*, contains the results of the evaluation of which special-status species could potentially occur in the project vicinity. The list was developed through a review of observations made during the May 1, 2023 site surveys, as well as a query of CDFW's California Natural Diversity Database (CNDDB), California Natural Plant Society's (CNPS) Rare Plant Inventory, USFWS's Information for Planning and Consulting (IPaC), USFWS's National Wetlands Inventory (NWI), Google Earth, the applicant-prepared biological resources assessment (Live Oak Associates 2022a), and the applicant-prepared arborist report (Live Oak Associates 2022b). The results of these queries were then reviewed, and a determination made as to whether they could occur on site. The determination was made based on whether suitable habitat was present on site, as well as the proximity of known occurrences.

Special-Status Plants

Of the 64 special-status plant species that are known to occur regionally (CDFW 2022), 4 have the potential to occur on the site: Anderson's manzanita (*Arctostaphylos andersonii*), Montara manzanita (*Arctostaphylos montaraensis*), western leatherwood (*Dirca occidentalis*), and San Mateo woolly sunflower (*Eriophyllum latilobum*), all of which are known to only occur in wooded habitats. However, the grasslands and developed areas of the site would not support these species. Manzanita shrubs were observed in a wooded portion of the site along the southeastern margin of the site. These were confirmed to be the nonspecial-status Cushing manzanita. Therefore, the project site does not contain any special-status plant species.

Special-Status Wildlife

Of the 21 special-status wildlife species that are known to occur regionally just one was originally presumed extant on the site. The San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) is a California species of special concern whose presence on site was confirmed during the April 2022 site visit through observations of woodrat stick nests and fresh scat in woodlands. Special-status bats, including, Townsend's big-eared bat (*Corynorhinus townsendii*), big free-tailed bat (*Nyctinomops macrotis*), and pallid bat (*Antrozous pallidus*), as well as protected nesting migratory birds may also use the site for breeding or foraging. No evidence of bats was observed during the April 2022 site visit or the May 2023 biological survey. Special-status bats and nesting migratory birds may nest in or among vegetation and buildings on the site.

Sensitive Natural Communities and Habitats

Sensitive natural communities include those that are of special concern to resource agencies or are afforded specific consideration through CEQA or other federal or state laws. Sensitive habitats include habitats considered important to conservation by local, regional, and state agencies. Most types of wetlands and riparian communities are considered sensitive habitats due to their limited distribution in California, and these habitats are regulated under state and federal laws. There are no sensitive natural communities within or adjacent to the project site. A review of the NWI was done to determine the closest jurisdictional aquatic features to the proposed project. However, field observations from ICF biologists on May 1, 2023, indicate that neither intermittent stream at the eastern boundary of the project exist. No ordinary-high water marks were observed, and the vegetation of these areas did not differ from the surrounding mixed pine eucalyptus forest habitat. There is a more substantial intermittent drainage that parallels Crystal Springs Road, but it lacks connectivity with the project site Although a portion of the forested slopes in the western part of the site was inaccessible during the April 2022 survey, this area was undifferentiated in both vegetative

composition and slope from accessible areas; therefore, it is presumed that this area does not include wetlands. Additionally, no aquatic habitats were identified during a May 2023 site visit.

Wildlife Movement Corridors

The project site has no contiguous habitat areas that provide for movement of wildlife through the project site.

Heritage Trees

Based on the arborist report prepared by HortScience | Bartlett Consulting, 268 of the 361 trees surveyed are classified as heritage status (HortScience | Bartlett Consulting 2023). The city's Heritage Tree Ordinance declares such trees, whether located on city or private property, to be an asset to the community at large and provides penalties for removing or improperly pruning these trees. In addition, all public trees are protected.

Habitat Conservation Plans and Natural Community Conservation Plans

San Bruno Mountain Habitat Conservation Plan (HCP) is the closest HCP, located approximately 12 miles northeast of the project area but does not cover or apply to the project area.

3.3.2 Environmental Impacts

Methods for Analysis

This impact evaluation is based on data collected from a biological survey that was conducted by an ICF biologist and botanist. The survey entailed documenting baseline biological conditions on the project and a 100-foot buffer (survey area). The biological survey focused on characterizing and mapping suitable habitat for special-status species (including woodrat middens/nests, bat habitat, nesting bird/raptors, special-status plants). Lists of species observed during the field survey were recorded. The results of the biological field survey were compared to those found in the applicant-prepared biological resources assessment (Live Oak Associates 2022) and updated arborist report (HortScience | Bartlett Consulting 2023).

Prior to conducting the field survey, ICF reviewed existing and available online resources including CDFW's CNDDB, CNPS's Rare Plant Inventory, USFWS's IPaC, USFWS's NWI, Google Earth, the applicant-prepared biological resources assessment (Live Oak Associates 2022), and the original applicant-prepared arborist report (HortScience | Bartlett Consulting 2022).

Although it is foreseeable that the existing leagues that use the fields would continue to use the fields once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. This could result in additional use of the fields during the day and increase use of nighttime lighting. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and therefore cannot be further analyzed.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the following conditions.

- Impact BIO-1: A substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
- Impact BIO-2: A substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
- Impact BIO-3: A substantial adverse effect on state- or federally protected wetlands (e.g., marshes, vernal pools, coastal wetlands) through direct removal, filling, hydrological interruption, or other means.
- Impact BIO-4: Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedance of the use of native wildlife nursery sites.
- Impact BIO-5: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Impact BIO-6: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

Impacts

Impact BIO-1: Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? (Less than Significant with Mitigation)

San Francisco Dusky-footed Woodrat

Construction

Woodrat stick nests were observed within the mixed pine eucalyptus forest habitat during the May 1, 2023, field survey and were also documented in the applicant-prepared biological resources assessment (Live Oak Associates 2022). It is expected that avoidance of all or most of the woodrat nests should be feasible, as most of the area where construction would occur is already developed and is unsuitable habitat for nest development; however any construction or demolition activity that results in harm or mortality to this species, or in nest abandonment, may be considered a significant impact under CEQA. Most nests are present in the wooded area and could potentially be removed or disturbed by vegetation management work during construction. These impacts would be **potentially significant**.

Mitigation measure BIO-1a would be implemented to reduce the potential for impacts on San Francisco dusky-footed wood rat through conducting preconstruction surveys to identify any nests

30 days prior to the onset of construction. This survey timing would allow for the scheduling of and relocation of woodrat nests, if necessary. The survey should encompass all construction zones It is expected that avoidance of all or most of the nests would be feasible for construction, as most of the area where construction would occur is already developed and is unsuitable habitat for nest development. Impacts under the variant would be the same as the proposed project because vegetation removal and management activities would be the same. Impacts would be **less than significant with mitigation**.

Operations

Similar impacts due to ongoing vegetation management during project operations would pose a similar threat to the woodrat nests, though to a lesser degree and would be **potentially significant**.

Mitigation measure BIO-1a would be implemented to reduce the potential for impacts on San Francisco dusky-footed wood rat through conducting surveys to identify any nests 30 days prior to the vegetation maintenance activities that could potentially have an impact on woodrat nests. This survey timing would allow for the scheduling of and relocation of woodrat nests, if necessary. The survey should encompass all construction zones, and, for ongoing vegetation management activities, areas where vegetation treatment would occur and surrounding lands within 50 feet of these zones. Impacts under the variant would be the same as the proposed project because vegetation removal and management activities would be the same. Impacts would be **less than significant with mitigation**.

Nesting Birds

Construction

Tree removal and project construction could potentially remove habitat or disturb nests of nesting or migratory birds. Construction impacts would be potentially significant, because of the potential to remove active nests. Trees, shrubs, and buildings occurring on and adjacent to the site could be used by raptors and other migratory birds for nesting. Project-related activities that adversely affect the nesting success of raptors and migratory birds (i.e., lead to the abandonment of active nests) or result in mortality of individual birds constitute a violation of state and federal laws. Disturbance of nesting bird species during nesting season could result in nest abandonment or the loss of fertile eggs or fledglings. This impact would be potentially significant.

Mitigation measure BIO-1b includes preconstruction and construction requirements to avoid and minimize potential impacts on migratory and nesting birds. Construction would occur either outside of the nesting season or, if it occurs during the nesting season, avoidance and buffers would be implemented to prevent nest abandonment. Impacts under the variant would be the same as the proposed project because vegetation removal activities would be the same. Impacts would be **less than significant with mitigation**.

Operations

Research indicates that urban nighttime lighting can adversely affect birds. There is evidence to show that in some cases lighting can impact bird species by drawing them toward development where they may collide with structures; however, these studies largely relate to sources of light that are substantially prominent and intense in comparison to their surroundings such as offshore oil platforms (Huppop et al. 2016) and the light beams that are part of the September 11 memorial in

New York City (Furuya 2017). The latter study found that the light installation "strongly concentrates and disorients migrants flying over a heavily urbanized area" (Furuya 2017). Even if birds do not collide with structures, there is a concern that once a bird is within a light beam, they are reluctant to return to darker areas and will fly until exhaustion (Ogden 1996). As discussed in Impact AES-4, lighting at the site would largely be well within industry standards for light and glare. Use of the athletic field lighting would be limited to evening practices and games ending by 10:00 p.m., at which time the stadium lights would be shut off. The proposed lighting would be visible with minor prominence in nighttime lighting conditions when compared to the existing nighttime baseline. As a result, the proposed project does not mimic the conditions in studies of avian deaths associated with light sources, and such impacts cannot be attributed to the proposed project.

Vegetation management activities could pose a similar risk to nesting birds as construction activities if they involve tree trimming or tree or vegetation removal pursuant to the vegetation management plan (Appendix H) when the trees or vegetation have active nests, or use of loud equipment (e.g., chainsaws, mowers) near active nests. Similar to construction, this impact would be **potentially significant**.

Mitigation measure BIO-1b includes requirements to avoid and minimize potential impacts on migratory and nesting birds that would also reduce impacts during vegetation management activities that have the potential to impact nesting birds. Vegetation management would occur either outside of the nesting season, or, if it occurs during the nesting season, avoidance and buffers would be implemented to prevent nest abandonment. Impacts under the variant would be the same as the proposed project because lighting and vegetation management activities would be the same. Impacts would be **less than significant with mitigation**.

Bats

Construction

No evidence of bats was observed during the April 2022 site visit however, the presence of bats inside the onsite buildings or within tree cavities within the forested portions of the site cannot be fully discounted. It is also possible the wooded area has larger trees with cavities that could also serve as roosting habitat for locally occurring bat species. Special-status bats known to occur in the region include Townsend's big-eared bat, big free-tailed bat, and pallid bat. Tree removal or ground disturbance activities during construction and demolition could disturb active nests and result in mortality of roosting bats. Project-related activities that adversely affect the nesting success of bats (i.e., lead to the abandonment of active nests) or result in mortality of individual bats could be a potentially significant impact.

Implementation of mitigation measure BIO-1c would require conducting preconstruction surveys within the project footprint and within a 50-foot buffer of the project footprint. If a nonbreeding or nonwintering bat colony is found, the individuals shall be humanely evicted via the partial dismantlement (two-step removal) of the trees or buildings prior to removal under the direction of a qualified biologist to ensure that no harm or take would occur to any bats as a result of removal activities. If a maternity colony or overwintering colony is detected in the trees or buildings of the site, then a construction-free buffer should be established and remain in place until it has been determined that the nursery or overwintering colony is no longer active. Impacts under the variant would be the same as the proposed project because construction activities that could impact bats would be the same. Impacts would be **less than significant with mitigation**.

Operations

Foraging bats may be found in the project area at night. Nighttime lighting can adversely affect bats while foraging at night. For example, insects may be attracted to certain kinds of light, which would then attract bats. Some bat species avoid LED lights. Studies generally focus on overall urban lighting (e.g., Rowse et al. 2015), although at least one study has focused on sport stadiums (Schoeman 2015). Some species benefit through better foraging, while others do not, which could lead to a reduction in biodiversity. However, similar to lighting impacts on birds, lighting at the site would largely be well within industry standards for light and glare. The number of nighttime activities would be limited in quantity and duration. Stadium lighting would be on for a limited time and would not be used any later than 10:00 p.m. except for limited circumstances where athletic games continue past their planned end times. As a result, the lighting may have some effect on bat foraging, but evidence does not exist to definitively conclude it would result in effects on biodiversity.

Impacts on bats may occur similar to construction during vegetation management activities that involve tree removal pursuant to the vegetation management plan (Appendix H). Mitigation measure BIO-1c would be implemented to similarly reduce these impacts. Impacts under the variant would be the same as the proposed project because vegetation removal and management activities would be the same. Impacts would be **less than significant with mitigation**.

Mitigation Measure BIO-1a: Conduct Preconstruction Survey for Dusky-footed Woodrat and Implement Appropriate Measures

Prior to project demolition/construction and prior to the vegetation maintenance activities that could potentially have an impact on woodrat nests, a qualified biologist shall conduct a preconstruction survey for San Francisco dusky-footed woodrat nests within and adjacent to the project footprint no more than 30 days prior to the onset of construction activities; demolition activities; and vegetation management activities that may impact woodrat nets, as defined in the vegetation management plan with input from a qualified biologist. This survey timing allows for the scheduling of and relocation of woodrat nests, if necessary. The survey shall encompass all construction zones and surrounding lands within 50 feet of these zones.

All identified nests shall be avoided, where possible. Woodrat nests that occur within 50 feet of the project work area shall have a construction-free physical buffer established around them demarcated by flagging, exclusion fencing, or other suitable materials, as determined by a qualified biologist. If avoidance of a nest is not possible, the nest(s) shall be manually relocated when young are not present using the following methods.

- To safely dismantle a nest, the dismantling process shall occur in October through December under the direction of a qualified biologist. If this timing is not feasible or compatible with the timing of construction, the biologist could dismantle the nest at a different time, but if baby woodrats (i.e., pups) are exposed during the process, the nest shall be rebuilt over the pups, and the nest shall be buffered for approximately 3 weeks before dismantling can recommence. To start dismantling, a landscape crew or other qualified crew shall be present on site with the qualified biologist to clear vegetation for the qualified biologist to access the nest(s). All persons involved in the removal of materials (biologist and landscape crew) shall wear a respirator, long sleeves, and gloves during the disassembling and removal process to reduce the potential for exposure to hantavirus, rotavirus, and other diseases that woodrat nests may contain. Two to three temporary shelters such as an upside-down half-wine

barrel or wooden box with rodent-sized opening shall be placed near the nest to be disassembled to provide any evicted woodrats a safe cover (refugia). Deconstruction of the nest shall be conducted by the biologist on the opposite side of the nest as temporary refugia so that woodrats have a direct path to the refugia.

- Disassembling work shall be conducted by a qualified biologist in afternoon/evening hours to the extent practicable to limit stress to any evicted woodrats. Deconstructed nest material shall be placed on a tarp to either dispose of it or to use it to rebuild a nest with the same material in a different location. Materials on the tarp shall include structural, nesting chamber, and stored food. Relocation of nests shall be built as close as possible with a center chamber at the bottom with nesting material and food stores with sticks forming a chamber above this. If forming a nest chamber is difficult given the material of the original nest, additional sticks from the surrounding areas can be used or a wooden box with a hole cut for the entrance can be used based on the judgment of the qualified biologist.
- Survey results and any disassembling and relocation work (if needed) shall be documented in a report provided to the city.

Mitigation Measure BIO-1b: Avoid Impacts on Nesting Birds

To address impacts on nesting raptors and migratory birds, project-related activities (i.e., demolition, construction, vegetation management) that occur during the breeding season (February 1 through August 31) should be constrained in the vicinity of any active nests. If tree removal, use of powered equipment (e.g., chainsaws, line trimmers, mowers), or ground-disturbance activities are scheduled to commence during the breeding season, nesting bird surveys shall be conducted by a qualified biologist to identify possible nesting activity. A qualified biologist shall conduct preconstruction/pre-activity surveys for nests on any tree, other vegetation, or structure within 500 feet of the project/activity footprint no more than 14 days before demolition, construction, or vegetation management activities begin. If no active nests are found during focused surveys, no further action under this measure will be required. No tree shall be removed or trimmed if an active bird nest is present. If necessary, modifications to the project design to avoid removal of occupied habitat while still achieving project objectives shall be evaluated and implemented to the extent feasible.

If avoidance of the nesting season is not feasible or conflicts with project objectives, demolition, construction, and vegetation management with powered equipment shall be prohibited within a buffer (generally 50 to 100 feet for songbirds and 250 to 500 feet for raptors, depending on the location and the professional judgment of the qualified biologist) of the nest to avoid disturbance until the nest is no longer active. Buffers may be reduced according to the discretion and professional judgment of the qualified biologist. The buffer shall be clearly marked and maintained until the young have fledged and are foraging independently. Prior to construction, demolition, or vegetation management activities, the qualified biologist shall conduct baseline monitoring of each nest to characterize "normal" bird behavior and establish a buffer distance, which allows the birds to exhibit normal behavior. The qualified biologist shall monitor the nesting birds during applicable activities and increase the buffer if birds show signs of unusual or distressed behavior (e.g., defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman/vegetation management lead shall have the authority to cease all work in the area until the young have fledged and the nest is no longer active.

A survey report shall be prepared and provided to the city to document the survey results. If monitoring is needed, the report shall also include the results of monitoring. An activity-free buffer of suitable dimensions must be established around any active raptor and migratory bird nests (generally 50 to 100 feet for songbirds and 250 to 500 feet for raptors, depending on the location and the professional judgment of the qualified biologist) for the duration of the construction, demolition, or vegetation management activity or until it has been determined that the chicks have fledged and are independent of their parents.

Mitigation Measure BIO-1c: Avoid Impacts on Bats

To address any potential impacts on bats, a preconstruction/predemolition or, for ongoing vegetation management activities, a pre-tree removal survey for roosting bats shall be conducted within the project/tree removal footprint and within a 50-foot buffer of the project footprint/tree removal footprint within 14 days before the start of those activities. If a nonbreeding or nonwintering bat colony is found, the individuals shall be humanely evicted via the partial dismantlement (two-step removal) of the trees or buildings prior to removal under the direction of a qualified biologist (with specialized knowledge of bats) to ensure that no harm or take would occur to any bats as a result of removal activities. If a maternity colony or overwintering colony is detected in the trees or buildings of the site, then a construction-free/activity-free buffer should be established around the tree(s) and/or building(s) and remain in place until it has been determined that the nursery or overwintering colony is no longer active. The size of the buffer shall be highly dependent on bat species, nesting/roosting location, level of existing disturbances, etc., and shall be decided at the discretion and professional judgment of a qualified biologist.

A survey report shall be prepared and provided to the city to document the survey results. If monitoring is needed, the report shall also include the results of monitoring, which shall be the obligation of the applicant/developer with oversight by the City, with all costs, including City oversight costs, paid for by the applicant/developer.

Impact BIO-2: Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? (No Impact)

Riparian habitat in San Bruno have been identified in Junipero Serra Park and Crestmoor Canyon. No areas meeting the regulatory definition of jurisdictional waters, were observed within the proposed development envelope or elsewhere on the site. The project variant would have the same physical location as the proposed project and would therefore have the same impact as the proposed project. Therefore, there would be **no impact** during construction or operation.

Impact BIO-3: Would the project have a substantial adverse effect on state- or federally protected wetlands (e.g., marshes, vernal pools, coastal wetlands) through direct removal, filling, hydrological interruption, or other means? (No Impact)

Direct removal, filling, or hydrological interruption to state or federally protected wetlands are not included as part of the project; thus, there will be no construction-related or operational impacts. No indirect impacts are expected on the more substantial intermittent drainage that parallels Crystal Springs Road due to the distance and lack of connectivity with the project site as well as with the

implementation of general construction best management practices (BMPs). Therefore, there would be **no impact**.

Impact BIO-4: Would the project substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedance of the use of native wildlife nursery sites? (No Impact)

There are no migratory wildlife corridors, established native residents, or migratory fish or wildlife species identified within the project site. Future development patterns would largely mimic the buildings currently on the site and would maintain the vegetated hillside area located in the western portion of the project site. Urban wildlife could still move throughout the area during construction and operations. The project variant would have the same physical location as the proposed project and would therefore have the same lack of construction-related and operational impacts as the proposed project. Therefore, the project would have **no impact**.

Impacts related to nesting birds and bats are addressed in Impact BIO-1.

Impact BIO-5: Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? (Less than Significant with Mitigation)

Trees on the site that qualify as protected heritage trees under the city's heritage tree ordinance would be removed as part of the project. According to the most recent landscape plan, for the residential component of both the proposed project and the project variant, about 250 trees would be removed from the site, about 162 of which are heritage trees. The applicant has indicated that 315 replacement trees would be provided for the project and variant and would be in accordance with the recommendations of the City of San Bruno. The project would also obtain a tree removal permit and would therefore not conflict with the San Bruno Tree Ordinance. Additionally, eucalyptus trees may be removed from the vegetation management area. Stumps of removed eucalyptus may be treated with herbicides to control resprouting because they can readily resprout when cut, grazed, or burned. Monterey pines, or any other trees, that are dead or in declining health would also be considered for removal. Trees that are otherwise healthy would be selected for removal if they are deemed a fire hazard after other methods for fuel reduction (e.g., crown raising) have been considered. Any subsequent removal of trees as part of vegetation management or ongoing maintenance of the site would also be subject to San Bruno Tree Ordinance requirements, and permits would be obtained as needed.

The following General Plan policy relates to landscape plans for new development.

> **ERC-10:** Require incorporation of native plants into landscape plans for new development as feasible— especially in areas adjacent to natural areas, such as canyons or scenic roadways. Require preservation of mature trees, as feasible, during design and construction.

While the residential area is adjacent to natural areas, the proposed project and variant contain a 70-foot area zoned as defensible space. Plant palettes for the residential component contain some native plants (e.g., *rosa California*) but also contain numerous nonnative plants (e.g., *pittosporum tobira lomandra confertifolia*, *3.3-13erium oldeander*). As a result, there is likely a conflict with policy ERC-10. However, the site already contains nonnative plants (*Deodar cedar, Platanus × hispanica*, *Eucalyptus camaldulensis*, *Pinus radiata*, and *Festuca perennis*). Therefore, there would be no environmental impact resulting from the conflict with this General Plan policy.

Activities such as grading, installation of utilities, and construction of new homes may damage adjacent tree crowns and roots adjacent to the project area, which could potentially damage heritage trees. This impact would be potentially significant.

Mitigation measure BIO-5 includes guidelines that would be implemented to mitigate any potential impact on surrounding trees. Through designation of a tree protection zone and modification of activities to reduce potential impacts, these impacts would *be* **less than significant with mitigation**.

Mitigation Measure BIO-5: Protect Retained Heritage Trees

The project proponent shall establish tree protection zones for retained heritage trees and specific measures to minimize impacts related to tree removal:

- Project Design
    - Ensure adequate but not excessive water is supplied to trees; in most cases occasional irrigation will be required. Avoid directing runoff toward trees.
- Tree Protection Zones
    - Establish a Tree Protection Zone around each tree to be preserved. For trees outside the project area, the Tree Protection Zone shall be the existing fence line on all sides.
    - After tree removals are determined among the 182 perimeter trees surveyed, the project's security fence shall define the Tree Protection Zone. Fences are to remain until all grading and construction is completed. Where demolition must occur close to trees, such as removing curb and pavement, install trunk protection devices such as winding silt sock wattling around trunks or stacking hay bales around tree trunks.
    - Any approved grading, construction, demolition, or other work within the Tree Protection Zone should be monitored by the Consulting Arborist. The Arborist shall also determine approval for any root pruning for construction purposes outside the Tree Protection Zone.
    - All grading within the dripline of trees shall be done using the smallest equipment possible. The equipment shall operate perpendicular to the tree and operate from outside the Tree Protection Zone. Any modifications must be approved and monitored by the Consulting Arborist.
- Open Space Management and Project Operations
    - A qualified arborist shall provide input on a management plan for the future open space areas that addresses ongoing management of heritage trees consistent with the guidance in this mitigation measure and with the San Bruno Tree Ordinance. The input shall address actions to protect retained heritage trees during ongoing vegetation management activities.
    - Use only herbicides safe for use around trees and labeled for that use, even below pavement.
    - All pruning shall be done by a State of California Licensed Tree Contractor (C61/D49) who is a Certified Arborist or Certified Tree Worker and shall be conducted in accordance with the Best Management Practices for Pruning (International Society of

Arboriculture 2002) and adhere to the most recent editions of the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300).

Impact BIO-6 Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan? (No Impact)

There is no applicable HCP or natural community conservation plan. Therefore, the proposed project would not conflict with any adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plans. There would be **no impact**.

3.4 Cultural Resources

This section evaluates the project's potential environmental impacts on cultural resources. It first describes the existing cultural resources and background of the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.4.1 Existing Conditions

Regulatory Setting

State

California Environmental Quality Act and Guidelines (Section 15126.2[a])

The California Environmental Quality Act (CEQA) requires that certain public or private projects financed or approved by state or local public agencies be assessed to determine their potential to affect historical resources. CEQA uses the term *historical resources* to include buildings, sites, structures, objects, or districts, each of which may have historical, prehistorical, architectural, archaeological, cultural, or scientific importance.

The State CEQA Guidelines state that if implementation of a project would result in significant effects on historical resources, then alternative plans or mitigation measures must be considered; however, only significant historical resources need to be addressed (14 California Code of Regulations [CCR] 15064.5, 15126.4). Therefore, before impacts and mitigation measures can be identified, the significance of historical resources must be determined.

The State CEQA Guidelines define three ways that a property may qualify as a historical resource for the purposes of CEQA review.

1. The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR).
2. The resource is included in a local register of historical resources, as defined in Section 5020.1[k] of the California Public Resources Code (PRC) or identified as significant in a historical resource survey meeting the requirements of Section 5024.1[g] of the PRC, unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3. The Lead Agency determines the resource to be significant, as supported by substantial evidence in light of the whole record (CCR, Title 14, Division 6, Chapter 3, section 15064.5[a]).

Each of these ways of qualifying as a historical resource for the purpose of CEQA is related to the eligibility criteria for inclusion in the CRHR (PRC Sections 5020.1[k], 5024.1, 5024.1[g]). A historical resource may be eligible for inclusion in the CRHR if it meets any of the following conditions:

1. The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

2. The resource is associated with the lives of people important in our past.
3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of an important creative individual or possesses high artistic values.
4. The resource has yielded, or may be likely to yield, information important in prehistory or history.

Properties that are listed in or eligible for listing in the National Register of Historic Places (NRHP) are considered eligible for listing in the CRHR and thus are significant historical resources for the purpose of CEQA (PRC Section 5024.1[d][1]. The criteria (36 CFR 60.4) for determining NRHP eligibility are as follows.

1. The property is at least 50 years old (however, properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP);
2. It retains integrity of location, design, setting, materials, workmanship, feeling, and associations; and
3. It possesses at least one of the following characteristics:
    A. Association with events that have made a significant contribution to the broad patterns of history (events).
    B. Association with the lives of persons significant in the past (persons).
    C. Distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant, distinguishable entity whose components may lack individual distinction (architecture).
    D. Has yielded, or may be likely to yield, information important to prehistory or history (information potential).

Listing in the NRHP does not entail specific protection or assistance for a property, but it does guarantee recognition in planning for federal or federally assisted projects, eligibility for federal tax benefits, and qualification for federal historic preservation assistance. Additionally, project effects on properties listed in the NRHP must be evaluated under CEQA.

According to the State CEQA Guidelines, a project that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant impact on the environment (14 CCR 15064.5[b]). Under State CEQA Guidelines, a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired. Actions that would materially impair the significance of a historic resource are any actions that would demolish or adversely alter the physical characteristics that convey the property's historical significance and qualify it for inclusion in the CRHR or in a local register or survey that meet the requirements of PRC Sections 5020.1(k) and 5024.1(g).

The State CEQA Guidelines include in their definition of historical resources "any object [or] site … that has yielded or may be likely to yield information important in prehistory" (State CEQA Guidelines Section 15064.5[3]), which is typically interpreted as including fossil materials and other

paleontological resources. Impacts on paleontological resources are addressed in Section 3.6, *Geology, Soils, and Paleontology*.

California Health and Safety Code—Treatment of Human Remains

Health and Safety Code Section 7050.5

California Health and Safety Code Section 7050.5 requires that, in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined that the remains are not subject to the provisions of Section 27491 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner, and cause of any death. If the coroner determines that the remains are not subject to his or her authority and if the coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (NAHC).

Public Resources Code Section 5097.94: Native American Heritage Commission Powers and Duties

PRC Section 5097.94 outlines the powers and duties of the NAHC. PRC Section 5097.94(k)(1) gives them the power to "mediate, upon application of either of the parties, disputes arising between landowners and known descendants relating to the treatment and disposition of Native American human burials, skeletal remains, and items associated with Native American burials." Section 5097.94(l) also gives the NAHC the power "[t]o assist interested landowners in developing agreements with appropriate Native American groups for treating or disposing, with appropriate dignity, of the human remains and any items associated with Native American burials."

Public Resources Code Section 5097.98: Notification of Most Likely Descendant

PRC Section 5097.98 states that the NAHC, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code Section 7050.5, shall immediately notify the most likely descendant of the deceased. With permission of the landowner or a designated representative, the most likely descendant may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The most likely descendant shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

Public Resources Code Section 5097.99: Possession of Native American Artifacts and Remains

PRC Section 5097.99(b) makes it a felony to "knowingly or willfully obtains or possesses any Native American artifacts or human remains which are taken from a Native American grave or cairn after January 1, 1988, except as otherwise provided by law or in accordance with an agreement reached pursuant to subdivision (l) of Section 5097.94 or pursuant to Section 5097.98 . . . ."

Assembly Bill 52

Refer to Section 3.16, *Tribal Cultural Resources*, for a description of Assembly Bill (AB) 52, which established tribal cultural resources as environmental resources under CEQA.

Senate Bill 18

Refer to Section 3.16, *Tribal Cultural Resources*, for a description of California Government Code Section 65352.3 (adopted pursuant to the requirements of SB 18), which requires local governments to contact, refer plans to, and consult with tribal organizations prior to making a decision to adopt or amend a general or specific plan.

Local

The City of San Bruno does not maintain a city-wide historic resource inventory, nor is a local historic preservation ordinance currently in effect.

The *San Bruno General Plan* (City of San Bruno 2009) outlines a vision for the long-range physical and economic development of the community through 2025. The General Plan land use designations, policies, and implementing actions will guide local officials in making decisions on private development proposals and public facilities. The General Plan contains an Environmental Resources and Conservation Element, which outlines policies relating to biological resources and habitat, water quality, air quality, global climate change, historical and cultural resources, and environmental resources and conservation policies. The applicable policies for the proposed project and variant include:

- **Guiding Policy ERC-F**. Preserve and enhance historic and cultural resources within the city, particularly within the historic Downtown area.
- **Historical and Cultural Resources Implementing Policies**:
    - **ERC-39**. Continue to protect archaeological sites and resources from damage. Require that areas found to contain significant indigenous artifacts be examined by a qualified archaeologist for recommendations concerning protection and preservation.

Environmental Setting

Project Location

The proposed project is located within unsectioned lands of Township 4 South, Range 5 West Mount Diablo Base Line and Meridian, as depicted on the United States Geological Survey (USGS) Montara Mountain, California 7.5-minute topographic quadrangle. Freshwater sources, often linked to human habitation sites, in the project area include the San Bruno Creek, which is less than 1 mile northwest of the project site. Currently, San Andreas Lake is located less than 0.5 mile southwest of the project site. However, the lake is a result of an earth dam that was built across San Andreas Creek in 1868 (USGS 1864; Hynding 1982; Thompson and Johnson 1892). Prior to the building of the dam, the area was characterized by sag ponds, which form when fresh water collects in strike-slip faults, such as the San Andreas Fault.

The project site is located west of the San Francisco Bay, and east of the Santa Cruz Mountains, just east of the San Andreas Fault. The entirety of the project site is landward of the predevelopment bay shoreline. The majority of the project site is underlain by the Merced Formation (an upper Pliocene-early Pleistocene formation), with some Holocene slope wash (formed via the downslope movement of sediment), and historic-age artificial fill (Pampeyan 1994). The Merced Formation is composed of Cenozoic-aged (less than 66 million years old) sedimentary rock, that formed as sediment was deposited in a basin created by the San Andreas Fault (Andersen et al. 2001).

Precontact

Prior to the arrival of Europeans and the development of Spanish missions, Native American groups occupied the San Francisco Peninsula for at least 7,800 years. Most known Native sites in San Francisco are midden deposits of shellfish and occupation debris that accumulated at locations where groups resided or gathered and processed shellfish near the shores of San Francisco Bay or the coast. Subsequent development has resulted in most of these mounds being eroded away, removed during construction activities, or buried, as the marshy bayshore was raised and the land leveled for buildings and roads.

The following summarizes the pre-European contact period of the Bay Area by geologic time segments; it should be noted that these periods are academic constructs and are not necessarily reflective of the views of the descendants of the original Native American peoples.

Terminal Pleistocene (13,500–11,600 cal BP[1])

Throughout California, Terminal Pleistocene occupation is infrequently encountered and poorly understood and most often represented by isolated fluted points (Byrd et al. 2010; Erlandson et al. 2007; Rondeau et al. 2007); however, no fluted points or archeological deposits dated to this time have been documented in the Bay Area (Byrd et al. 2010). Several factors have likely contributed to the lack of evidence of this period in the Bay, including what is assumed to be the small, mobile, and quickly moving nature of initial human populations.

Early Holocene (11,600–7700 cal BP)

The Early Holocene cultural landscape of central California was characterized by semimobile hunter-gatherers exploiting a wide range of food resources from marine, lacustrine, and terrestrial contexts (Erlandson et al. 2007; Jones et al. 2002; Moratto 2002); however, little cultural evidence of the Early Holocene has been documented in the Bay Area. There are four known and dated Early Holocene sites in or near the Bay Area, all of which were found in terrestrial contexts (Rosenthal and Meyer 2004:30–32).

Middle Holocene (7700-3800 cal BP)

The Middle Holocene was characterized by a diverse range of habitation sites and artifact assemblages, which suggests higher population levels, more complex adaptive strategies, and longer seasonal occupation than during the Early Holocene (Byrd et al. 2010). More than 30 Bay Area archeological sites have produced radiocarbon dates indicating occupation during this period, including isolated human burials (SFR-28, SFR-205, SMA-273), and one submerged shell midden in Mission Bay (SFR-220) (Byrd et al. 2010; Lentz et al. 2018).

Late Holocene (3800-170 cal BP)

The Late Holocene is generally divided into the following five main archeological time periods: Early (4500/3800–2450 cal BP), Early-Middle Transition (2450–2050 cal BP), Middle (2050–900 cal BP), Middle-Late Transition (900–700 cal BP), and Late (700–170 cal BP). There are more than 200 documented Late Holocene sites in the Bay Area. The Early Period of the Late Holocene marks the establishment of several large shellmounds. Artifacts and exotic material types suggest that an extensive trade network had been established by this time (Byrd et al. 2010). The Middle Period of

[1] cal BP = calibrated years before the present.

the Late Holocene is characterized by greater settlement permanence, mound building, and increasing social complexity (Lightfoot 1997; Lightfoot and Luby 2002). The bow and arrow first appeared during the Late Period, and extensive trade relations with neighboring groups continued. Funerary rituals were strongly patterned and included flexed interment positions and "killed" grave offerings (Byrd et al. 2010).

Ethnographic Background

The San Francisco Peninsula was traditionally inhabited by the Yelamu people (Milliken 1995:260). The Yelamu were one of eight small tribes (or tribelets) of the Ohlone people. The territory of the Ohlone people extended along the coast from the Golden Gate Bridge in the north to just below Carmel to the south and along several inland valleys that led from the coastline (Levy 1978:485–486) to the northern tip of the San Francisco Peninsula in the late eighteenth century (Milliken 1995:260). At the time of contact, the northern portion of the San Francisco Peninsula was composed of dunes and coastal prairie. Here, the Yelamu were organized into three small bands who occupied various locations on the peninsula at different times of the year. Each band had its own preferred locations and did not appear to occupy locations inhabited by the other bands. Mission records indicate that people from each of these villages were present at Mission San Francisco from 1777 to 1787 (Milliken 1995:68, 260).

Spanish colonization and subsequent rule by Mexico in 1821 and the United States in 1848 translated into dramatic disruptions in the Ohlone population (Milliken 1995). The Spanish brought many Native Americans into the missions, often by force, and they were held captive there. The Spanish subjected Native American neophytes (mission converts) to disrupted subsistence and trade patterns, physical punishment, efforts to eradicate native religion, and new disease. With the secularization of the missions in Mexico, a new class of Hispanic rancho landowners found a readily exploitable supply of labor in the Native Americans cut loose from the Missions, many of whom occupied the lower social stratum in pueblos.

Although they have yet to receive formal recognition from the federal government, the Ohlone persevered and are actively maintaining their ancestral heritage through political advocacy, education, and working for tribal sovereignty.

Historical Setting

Prior to California statehood, the project area in San Bruno was part of the large Rancho Buri Buri that included the southern portion of San Bruno Mountain, South San Francisco, San Bruno, Millbrae, and the northern part of Burlingame. The Rancho was gradually subdivided and sold to multiple landowners. Around 1853, Alfred Green established a dairy in the area that would become the city of San Bruno. From the 1850s through early 1900s, the area was primarily used for raising cattle and other agricultural purposes. One notable development in the area was the Tanforan Racetrack. The racetrack was established in 1898 and remained in operation until 1963. When San Bruno officially incorporated as a municipality on December 23, 1914, it was a small rural town with 1,400 residents with limited residential and commercial development located to east along El Camino Real. San Bruno's primary business remained agriculture, with ranches providing food, dairy products, and flowers for the urban San Francisco population (San Bruno Mayor and City Council 2014:2; ESA 2023:7; Stanger 1938:245–259; Still 2014:9–10).

The advent of World War II brought major changes to the small community. Like many parts of the peninsula, the government transformed large areas of farmland and other undeveloped land for use

as barracks, training grounds, and military support infrastructure. This growth was augmented by the increasing importance of the San Francisco Municipal Airport, which had been established in 1927 and eventually became the San Francisco International Airport. Proximity to the airfield made San Bruno a desirable location for military planners. Within San Bruno, the Tanforan Racetrack was converted into a Japanese American internment camp and the U.S. Army's Western Region Advance Personnel Depot was constructed immediately west of the racetrack.

In the decades following World War II, the farmland west of El Camino Real was subdivided for residential developments. The land immediately to the west of the project site was purchased by developer George Williams, who established the Crestmoor Park residential subdivision in the early 1950s (Bay Area Census 1950). The increasing development of the city led to the need for additional schools to be built to accommodate the growth in the student population and to relieve the congestion at Capuchino High School and Mills High School (SMUHSD 2022). Between 1940 and 1960, the population of San Bruno grew from 6,500 to 29,000, and increased again to 36,000 by 1970 (Bay Area Census 1950, 1960, 1970). During this period of substantial postwar development, Interstate 280 (I-280) (Junipero Serra Freeway) was constructed, linking the residents and commercial interests of San Bruno with the wider Bay Area.

Present Day Conditions

Archaeology

As of the writing of this document, the general scientific consensus regarding the timing of human occupation of North America is that humans have occupied the continent since around at least 13,500 years BP, or just before the end of the Pleistocene epoch (Braje et al. 2017; Erlandson et al. 2007; Waters et al. 2011). This means that landforms formed before this period probably have limited sensitivity for containing buried archaeological resources, whereas landforms formed after this period retain sensitivity for containing buried archaeological resources.

Based on a review of the relevant geologic literature, the majority of the project area is composed of late Pliocene to early Pleistocene formations, as well as Holocene slope wash and historic-age artificial fill. It is unlikely that deeply buried archaeological resources will be encountered within the late Pliocene to early Pleistocene deposits. However, buried pre-contact archaeological deposits may be encountered in the Holocene slope wash or below the historic-age artificial fill. Studies have generally observed that as distance to fresh water decreases, the frequency of archaeological sites and range of archaeological site types increases (Christenson 1990; Robbins-Wade 1990; Lothrop et al. 1987; Ingbar and Hall 2014). Thus, the proximity of San Bruno Creek and the previously existing sag ponds associated with the San Andreas Fault do suggest a higher sensitivity for buried archaeological sites. Buried historic-age archaeological deposits may also be encountered within the artificial fill, which is considered to have moderate sensitivity for buried archaeological sites.

Built Environment

The project site was originally developed as the Crestmoor High School campus and is located between I-280 to the east and the Crestmoor Park residential subdivision to the north and west. Surrounding land uses are residential except for the San Bruno Chinese Church to the northeast, which is separated from the project site by a landscaped hill. The Crestmoor Park residential subdivision was constructed in the 1950s, prior to the completion of the high school campus. The subdivision is characterized by single-family houses in modest variations of Mid-Century Modern and Minimal Traditional styles, primarily one story in height with site plans and curving streets

adapted for the hilly topography. Dense vegetation to the north and west separates the Crestmoor Park residential subdivision from the project site. To the southeast, dense vegetation separates the project from I-280.

Crestmoor High School was completed in 1962 (*San Mateo Times* 1962:4). The 40.2-acre parcel was most recently occupied by the Pen/Crest Center school but is currently vacant, though the recreational fields continue to be used by two soccer leagues and the public. The site was operated for uses such as the San Mateo County Superior Court (early 1990s), and a preschool (2000s –2020) and a church (2011–2017). The parcel includes six connected buildings in the Minimalist style, three small parking lots near the south end of the school, two sports fields, and a large parking lot near the north end of the school. The six rectangular-plan building modules are connected by a common roof structure, arranged around two offset interior courtyards in a shape resembling diagonal checkerboard squares. The northern courtyard is fully occupied by two swimming pools. The southern courtyard contains a raised concrete platform, benches, and minimal landscaping. A review of historic aerial photographs indicates that the subject property very closely resembles its original design. There have been no significant additions or alterations to the six connected buildings since their completion in 1962.

3.4.2 Environmental Impacts

Methods for Analysis

To assess potential impacts of the proposed project and alternatives, publications, maps, and websites for archaeological and environmental information about the project site were reviewed. The purpose of this review was to determine the potential for unrecorded precontact and historical archaeological deposits—including buried deposits—to occur within the project site. The literature reviewed included General Land Office plats, aerial photographs, USGS topographic maps, and relevant geologic literature.

Although it is foreseeable that the existing athletic leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. There would be no additional impact because intensity and frequency of use are not associated with impacts on cultural resources. Therefore, the potential for increased use, which is not currently definable, is not analyzed further.

Archaeological Resources

To identify the presence of previously recorded archaeological resources, including those potentially considered tribal cultural resources, ICF conducted a record search on May 23, 2023, at the Northwest Information Center (NWIC) in Rohnert Park, California, a part of the California Historic Resource Information System. No archaeological resources were identified within the project site, and two previously recorded archaeological resources were identified within 0.25 mile of the site. Both resources (P-41-000096, P-41-000098) are precontact shell middens, and one of them contained human remains.

Additionally, the results of a cultural resources investigations conducted by ESA (2022) were reviewed in detail. ESA also conducted archival research at the NWIC in Sonoma County on May 9, 2022 (File No. 21-1814.), reviewed the information regarding existing conditions in the project area,

and reviewed project maps and the surrounding topography to independently assess the sensitivity for the presence of cultural resources within the project area.

Historic Resources

The former Crestmoor High School building was constructed in 1961/1962. The building is over 45 years in age and meets the California Office of Historic Preservation's age threshold for consideration as a historical resource.

The project site at 300 Piedmont Avenue is not currently listed in the California Office of Historic Preservation's Built Environment Resource Directory (BERD) for San Mateo County. It is also not on file at the NWIC. This indicates that it is not currently listed in the National Register of Historic Places, California Register of Historical Resources (CRHR), or a local register. A record search for the property was conducted at the NWIC on May 9, 2022 (File No. 21-1814). Additionally, ESA staff conducted online archival research to document the development of the subject property and relevant historic contexts. The sources accessed included San Mateo Unified School District general information, the San Mateo County Property Maps Portal, City of San Bruno building permits, Newspapers.com for local newspaper articles (1960s), University of California Santa Barbara's FrameFinder for historic aerial photographs (1960s–2000s), and the USModernist® Architecture Magazine Library.

Based on a site survey, archival research, and the analysis presented in their *Historic Resource Evaluation for 300 Piedmont Avenue* (Appendix D),[2] ESA concluded that the former Crestmoor High School campus at 300 Piedmont Avenue is ineligible for individual listing in the CRHR under any criteria. There is no evidence to suggest that the building is associated with any events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. The building is not associated with a significant person. The building also does not embody the distinctive characteristics of a type, period, region, or method of construction, nor does it represent the work of a master, or possess high artistic values. The City of San Bruno does not maintain a citywide historic resource inventory, and a local historic preservation ordinance is not currently in effect. Therefore, 300 Piedmont Avenue would not be considered a historical resource for the purposes of CEQA (ESA 2023:2,15–16).

The geographic limits for the analysis of potential impacts on historical resources is the project site at 300 Piedmont Avenue. All historic-age development adjacent to the project site is physically and visually separated from the site. The San Bruno Chinese Church to the northeast is separated from the project site by a landscaped hill. Dense vegetation and rolling topography to the north and west separate the Crestmoor Park residential subdivision from the project site. There are no built environment historical resources on the project site, and there is no potential for the proposed project and variant to result in visual impacts on potential historical resources in the project area.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the following conditions.

- Impact CUL-1: A substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.

[2] ICF conducted a peer review of this evaluation.

- Impact CUL-2: A substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
- Impact CUL-3: Disturbance of any human remains, including those interred outside of formal cemeteries.

Impacts

Impact CUL-1: Does the project have the potential to cause a substantial adverse change in the significance of a historical resource (State CEQA Guidelines Section 15064.5), including physical demolition, destruction, relocation, or alteration of historical resources or their immediate surroundings, such that their significance would be materially impaired? The significance of a historical resource is considered materially impaired when a project demolishes or adversely materially alters those physical characteristics that convey its historical significance and that justify its eligibility for or inclusion in the CRHR or in registers meeting the definitions in PRC 5020.1(k) or 5024.1(g). (No Impact)

Implementation of the proposed project and variant would require the demolition of the former Crestmoor High School building currently within the project site at 300 Piedmont Avenue. The campus is not considered a historical resource for the purposes of CEQA, as described above and based on a site survey, archival research, and the analysis presented in the 2023 *Historic Resource Evaluation for 300 Piedmont Avenue* (Appendix D). Therefore, there would be **no impact** on historical resources from a construction or operational perspective. No mitigation is required.

Impact CUL-2: Would the project have the potential to cause a substantial adverse change in the significance of an archaeological resource, or potential disturbance to undiscovered archaeological resources (State CEQA Guidelines Section 15064.5)? (Less than Significant with Mitigation)

The records search conducted at the NWIC did not identify any previously recorded archaeological resources within the project site. However, the presence of two precontact midden deposits within 0.25 mile of the project site indicates increased potential for encountering as-yet undocumented archaeological deposits during project-related ground disturbance. No additional ground disturbance would occur during operation and so there would be no additional impact. For construction, however, this impact would be **potentially significant**. Implementation of Mitigation Measure CUL-2a and Mitigation Measure CUL-2b would reduce this potentially significant impact on archaeological resources during construction to a **less-than-significant** level by ensuring that project activities would not result in the inadvertent destruction of an archaeological resource.

Mitigation Measure CUL-2a: Conduct Cultural Resource Awareness Training Prior to Project-Related Ground Disturbance and Stop Work if Archaeological Deposits Are Encountered During Ground-Disturbing Activities

Prior to any project- or project variant–related ground disturbance, the applicant and/or City shall ensure that all construction workers receive training overseen by a qualified professional archaeologist who is experienced in teaching nonspecialists to ensure that contractors can recognize archaeological resources in the event that any are discovered during construction.

Construction staff directly overseeing excavation, or operating ground-disturbing vehicles during excavation activities, shall be required to participate in this preconstruction training.

Mitigation Measure CUL-2b: Stop Work if Buried Cultural Deposits are Encountered During Construction Activities

In the event that previously unidentified archaeological, historical, or tribal cultural resources are uncovered during site preparation, excavation, or other construction activity, the applicant and/or City shall cease or ensure the ceasing of all such activity within 50 feet of the discovery until the resources have been evaluated by a qualified professional (cultural resources specialist or archaeologist) and specific measures can be implemented to protect these resources in accordance with PRC Sections 21083.2 and 21084.1.

Preservation in place (avoidance) is the preferred method of mitigation for impacts on cultural resources (State CEQA Guidelines Section 15126.4(b)(3)(A)) and is required unless the cultural resources specialist or archaeologist determines that another method would provide superior mitigation of impacts on the resource. No additional mitigation is necessary if the resource can be completely avoided, but the resource shall be recorded on Department of Parks and Recreation (DPR) 523 forms, which shall be filed with the Northwest Information Center. The qualified cultural resources specialist shall follow the procedures below if the resource cannot be completely avoided:

- **Determine if the resource is an historical resource:** The qualified cultural resources specialist or archaeologist shall determine if there is a potential for the resource to be a historical resource. Work can resume if there is no potential for the resource to qualify as a historical resource. If there is a potential for the resource to be a historical resource, the qualified cultural resources specialist or archaeologist shall prepare an Evaluation Plan.
- **Prepare an Evaluation Plan:** The Evaluation Plan shall be prepared specific to the resource and shall contain procedures used to determine if the discovered resource is an historical resource. The Evaluation Plan shall include enough discussion of background and context to provide for evaluation of the resource under the historical resource criteria. It shall include a description of procedures that will be used to gather information for the evaluation, which may include but not be limited to excavation, written documentation, interviews, and photography. For any archaeological resource testing, the Evaluation Plan shall describe testing procedures, such as surface collection, test excavations, analysis methods, and reporting procedure.
- **Implement Evaluation Plan:** The evaluation plan shall be implemented in the field, and the subsequent report shall evaluate the resource based on the criteria contained in the Evaluation Plan, making a conclusion whether the resource is historical. If the resource is not historical, protective barriers can be removed and work can continue in the area. If the resource is historical, the qualified cultural resources specialist or archaeologist shall prepare a Data Recovery Plan.
- **Prepare a Data Recovery Plan:** A Data Recovery Plan shall be prepared consistent with State CEQA Guidelines Section 15126.4(b)(3)(C) and Public Resources Code Section 21083.2. The Data Recovery Plan will contain a description of how data recovery will mitigate impacts on the resource to less than significant. It shall contain a description of level of effort (e.g., quantity of excavation units), excavation procedures, laboratory methods, types of samples to be collected (e.g., sediment), and the techniques that will be

used to obtain information about the features of the site that make it a historical resource. Additionally, the Data Recovery Plan shall include a description of the reporting procedure. Once the Data Recovery Plan is completed, field work can commence. Work can resume in the area once the qualified cultural resources specialist/archaeologist determines that no additional information needs to be recovered to satisfy fieldwork, reporting, and documentation requirements to reduce impacts to less than significant.

- **Prepare a Data Recovery Report:** A Data Recovery Report shall be prepared following completion of data recovery field work. The Report shall present results of data recovery, including field methods used, location and size of excavations, and analysis of materials recovered. It shall contain conclusions made based on the field work as well as where any recovered artifacts, samples, and documentation will be curated. Curation facilities must meet requirements of 36 Code of Federal Regulations 79. The Data Recovery Report shall be submitted to the Northwest Information Center, with all impacted known resources recorded on DPR 523 forms.

Impact CUL-3: Would the project have the potential to disturb or potentially disturb any undiscovered human remains, including those interred outside of formal cemeteries? (Less than Significant)

As stated above, no previously identified archaeological resources have been recorded within the project site. The historic-period maps and aerial photographs indicate that no known previously recorded dedicated cemeteries or cultural resources that include human remains are located within or adjacent to the project site. However, the presence of two precontact midden deposits, one of which contained human remains, within 0.25 mile of the project site, indicates that there is increased potential for project-related ground disturbance to encounter human remains.

If human remains or suspected human remains are identified, the applicant and City would comply with relevant California law, including, but not limited to State CEQA Guidelines Section 15064.5(e); Public Resources Code Sections 5097.94, 5097.98, and 5097.99; and California Health and Safety Code Section 7050.5. These statutes require that, if human remains are discovered during construction activities, potentially damaging ground-disturbing activities in the area of the remains shall be halted immediately and the county coroner shall be immediately notified. As the statutory and regulatory processes unfold, significant impacts could occur if the remains are further disturbed.

Therefore, construction of the proposed project and variant has the potential to encounter as-yet undocumented human remains. No additional ground disturbance would occur during operation, and so there would be no additional impact. For construction, the laws discussed above would be implemented in the case of such an encounter, and impacts would be **less than significant**.

3.5 Energy

This section evaluates the project's potential environmental impacts on energy. It first describes the existing energy use characteristics of the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those impacts.

3.5.1 Existing Conditions

Regulatory Setting

State

Assembly Bill 1493, Pavley Rules (2002, amendments 2009)/Advanced Clean Cars Program (2022)

Known as Pavley I, Assembly Bill (AB) 1493 provided the nation's first greenhouse gas (GHG) standards for automobiles. AB 1493 required the California Air Resources Board (CARB) to adopt vehicle standards that will lower GHG emissions from new light-duty autos to the maximum extent feasible beginning in 2009. Additional strengthening of the Pavley standards (referred to previously as Pavley II and now referred to as the Advanced Clean Cars II regulations) was adopted for vehicle model years 2026–2035 in 2022. Together, the two standards are expected to increase average fuel economy to zero emissions by 2035.

California Energy Efficiency Standards (CALGreen) for Residential and Nonresidential Buildings—Green Building Code (2011), Title 24 Updates

The California Green Building Standards Code (Part 11, Title 24) (CALGreen) was adopted as part of the California Building Standards Code (24 California Code of Regulations [CCR]). CALGreen applies to the planning, design, operation, construction, use, and occupancy of newly constructed buildings, and requires the installation of energy- and water-efficient indoor infrastructure for all new projects beginning after January 1, 2011. CALGreen also requires newly constructed buildings to develop a waste management plan and divert at least 50 percent of the construction materials generated during project construction.

The current 2022 Building Energy Efficiency Standards for Residential and Nonresidential Buildings were adopted in 2021 and took effect on January 1, 2023. The 2025 Building Energy Efficiency Standards are currently in the pre-rulemaking phase. The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, and strengthens ventilation standards, to name a few (CEC 2023). As part of the 2022 California Energy Code update, the City has also adopted local amendments related to building electrification and electric vehicle infrastructure that are more stringent than the State's adopted standards. These amendments are codified in the City's Municipal Code, Chapters 11.06 and 11.07.

Senate Bill 350 (2015), Chapter 547—Clean Energy and Pollution Reduction Act of 2015

Senate Bill (SB) 350 DeLeon, also known as the Clean Energy and Pollution Reduction Act of 2015, was approved by the California legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions are to require the following by 2030: (1) a Renewable Portfolio Standard (RPS) of 50 percent and (2) to double statewide energy efficiency savings in natural gas and electricity end uses. In order to help meet these provisions, SB 350 requires that large utilities develop and submit integrated resource plans to detail how the utility will reduce GHG emissions and increase use of clean energy resources, while meeting the customers' needs.

Senate Bill 100—The 100 Percent Clean Energy Act of 2018 (2018)

SB 100 builds on SB 350, increasing the 2030 RPS target set in SB 350 to 60 percent and requiring an RPS of 100 percent by 2045.

Local

Peninsula Clean Energy 2018 Integrated Resource Plan

Peninsula Clean Energy (PCE) is a community choice energy (CCE) program that serves the entirety of San Mateo County, including the city of San Bruno. Its 2018 Integrated Resource Plan contains the following strategic goals that are relevant to the project.

- Design a diverse power portfolio that is GHG free.
    - 100 percent GHG free by 2021. As of 2023, PCE provides clean energy from sources such as wind and solar and is 100 percent carbon-free. Since 2016, PCE has saved over 1.2 million metric tons of carbon emissions (PCE 2023a).
    - 100 percent RPS-eligible renewable energy by 2025.
    - Minimum of 20 megawatts of new local power by 2025.
- Stimulate development of new renewable energy projects and clean-tech innovation in San Mateo County and California through PCE's procurement activities.
- Implement programs to further reduce GHG emissions by investing in programs such as local clean power production, electric vehicles, energy efficiency, and demand response, and partnering effectively with local businesses, schools, and nonprofit organizations.

PCE meets its renewable energy requirements with a combination of RPS-eligible energy products. According to the 2018 Integrated Resource Plan, PCE procured enough renewable energy to meet a 50 percent voluntary target as of 2017. The proportion of PCE's resource mix that is sourced from bundled renewable energy products will significantly increase as PCE transitions toward 100 percent renewable energy content in 2025. As stated, currently PCE provides clean energy from sources such as wind and solar and is 100 percent carbon-free. Since 2016, PCE has saved over 1.2 million metric tons of carbon emissions. Based on targeted renewable energy percentages, PCE intends to significantly outpace California's annual RPS procurement mandates throughout the 2018–2027 planning period.

San Mateo County Energy and Water Strategy 2025

San Mateo County adopted this strategy in March of 2019 as a way to increase collaboration and impact to achieve local and state climate goals, while preserving the diverse natural and cultural

richness of the area. The mission of the 2025 Strategy is to ensure a safe, equitable, and coordinated transition toward clean energy and a One Water approach[1] by leveraging new technologies, policy, funding resources, and opportunities for collaboration in San Mateo County. The vision of the 2025 Strategy is a successful collaboration of municipal, private, and public stakeholders, providing a sustainable utilization of energy and water resources and systems that are safe and reliable, in support of the county's climate action goals, energy infrastructure, and water supply (San Mateo County 2019).

City of San Bruno General Plan

The San Bruno General Plan, adopted in 2009, includes goals and policies that relate to energy use and reduction. The General Plan has identified Public Facilities and Services policies related to energy use and reduction. These policies include, but are not limited to, measures such as implementing the City's design guidelines that promote energy efficiency and requiring all new development to comply with Title 24 (CALGreen) standards. These measures contribute to energy reduction and use throughout the City, while promoting the use of renewable energy resources.

Environmental Setting

Energy resources in the state include natural gas, electricity, water, wind, oil, coal, solar, geothermal, and nuclear. Both energy production and use deplete nonrenewable resources, such as oil, natural gas, and coal, and result in the emissions of pollutants. The following discusses the existing conditions related to energy statewide, regionally, and at the project site.

State Energy Resources and Use

In 2020, California ranked second in the nation in total renewable energy generation, at 1,013.9 trillion British thermal units (BTUs). Additionally, due to its mild Mediterranean climate and strict energy-efficiency conservation requirements, the state has lower energy consumption rates than most parts of the country. California's per capita energy consumption of 200 million BTUs is one of the lowest in the nation and ranked 48th among all states as of 2020 (EIA 2020a). California also has among the lowest annual electrical consumption rates per person of any state, and its industrial uses consume 5.4 percent of the total energy consumed nationwide (EIA 2020b). The transportation sector consumed the highest quantity of energy (2,355.5 trillion BTUs), followed by the industrial (1,701.2 trillion BTUs), commercial (1,358.3 trillion BTUs), and residential (1,507.7 trillion BTUs) sectors (EIA 2020a).

Per capita energy consumption, in general, is declining because of improvements in energy efficiency and design. However, despite this reduction in per capita energy use, the state's total overall energy consumption (i.e., non–per capita energy consumption) is expected to increase over the next several decades as a result of growth in population, jobs, and vehicle travel.

Regional Energy Resources and Use

Pacific Gas and Electric Company (PG&E) provides natural gas services to the vast majority of Northern California, including the city of San Bruno and the project site. PG&E's service extends

[1] The One Water approach emphasizes that all water has value during its continuous movement of water through all the phases of the natural hydrological and reuse cycle, including stormwater and recycling water for potable and non-potable uses.

from Eureka to Bakersfield (north to south) and from the Sierra Nevada to the Pacific Ocean (east to west). PG&E purchases natural gas from a variety of sources, including other utility companies. They also obtain energy supplies from power plants and natural gas fields in northern California. PG&E operates a grid distribution system that channels all power produced at the various generation sources into one large energy pool for distribution throughout the service territory. In San Mateo County, a total of 117.82 million therms of natural gas were consumed in 2021, which is the most current data available (CEC n.d.).

PCE, which is discussed in the local regulatory setting above, is San Mateo County's default electricity provider. Individuals can opt out of PCE and switch to PG&E at any time, but PCE is the county's default provider, and their rates are lower or comparable to PG&E, depending on the selected PCE rate plan (PCE 2023b). Therefore, it is reasonably presumed that they would be the provider for the proposed project. PCE provides electricity to the city of San Bruno, including the project site. Their power comes from a mix of various sources, including solar, wind, geothermal, biomass and biowaste, and hydroelectric generation resources. PCE delivers power to its customers via existing PG&E utility infrastructure. They allow customers to choose between two different electricity product operations: ECOplus, which contains 50 percent renewable resources as electricity sources, and ECO100, which is 100 percent renewable resources as electricity sources (PCE 2019). Table 3.5–1 outlines PCE's power mix in 2021 compared to the power mix for the state. The PCE intends to be carbon free by 2026, which is the anticipated first year of full build out of the proposed project. In 2021, the most recent year for which data is available, PCE provided approximately 49.2 percent of San Bruno's electricity from eligible renewable energy resources for the ECOplus option, and 100 percent of the city's electricity from eligible renewable energy resources for the ECO100 option (PCE 2019). Electricity usage for different land uses varies substantially by the type of uses in a building, the type of construction materials used, and the efficiency of the electricity-consuming devices used. However, generally energy consumption in the city has decreased over recent years despite a growing population (San Mateo County n.d.).

Table 3.5-1. PCE and the State of California Power Mix in 2017

Energy Resources	PCE Option: ECOplus	PCE Option: ECO100	2021 California Power Mix
Eligible Renewable	49.2%	100%	33.6%
Biomass & biowaste	9%	0%	2.3%
Geothermal	0%	0%	4.8%
Eligible hydroelectric	0.6%	0%	1.0%
Solar	20.3%	50%	14.2%
Wind	19.4%	50%	11.4%
Coal	0%	0%	3%
Large Hydroelectric	50.8%	0%	9.2%
Natural Gas	0%	0%	37.9%
Nuclear	0%	0%	9.3%
Other	0%	0%	0.2%
Unspecified Sources	0%	0%	6.8%
TOTAL	**100%**	**100%**	**100%**

Source: PCE 2021

Project Site Energy Resources and Use

The project site currently contains the former Crestmoor High School, as well as playing fields, parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. The high school campus is currently vacant. Crestmoor High School closed in 1980, and Peninsula Alternative High School vacated the project site in 2021. Therefore, there are no active ongoing energy uses on site other than for incidental uses such as security lighting, maintenance equipment, and occasional maintenance. The recreational fields are currently utilized by local sport leagues. Energy is also consumed by visitors to the site, including those who drive to the fields for both organized recreation (e.g., soccer games) and occasional recreation activities (e.g., walking).

As stated previously, PG&E and PCE provide natural gas and electricity, respectively, to the city of San Bruno, and thus the project site via right-of-way electric and natural gas lines. A substation supporting a 60-kilovolt (kV) electric transmission line is located approximately 0.5 mile northeast of the project site, along Pepper Drive. Additionally, a 230-kV electric transmission line is located along Huntington Avenue, approximately 1.20 miles northeast of the project site. Distribution lines are conveyed from these electric transmission lines to electricity users within the project site (CEC 2017).

3.5.2 Environmental Impacts

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the following conditions below.

- Impact EN-1: Result in wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operations.
- Impact EN-2: Conflict with or obstruction of a state or local plan for renewable energy or energy efficiency.

Impacts

Impact EN-1: Would the project result in wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation? (Less than Significant)

Construction

Project construction activities would include demolition, rough grading, utility construction, paving activities, and vertical construction. These activities would require the operation of mobile and stationary construction equipment and on-road vehicles, including haul trucks for demolition debris removal, vendor trucks for deliveries, and employee vehicles. Construction equipment and activities for the project variant would be the same as the proposed project. Energy use would vary substantially depending on the specific construction phase, daily construction operations, types of equipment, and number of personnel; however, energy needs for project construction would be temporary and would not require additional capacity or increase peak or base period demands for electricity or other forms of energy. Unnecessary idling would be limited (13 CCR 2485), and equipment would be properly maintained. Standard best management practices would discourage unnecessary idling in accordance with the Airborne Toxic Control Measure to Limit Diesel-Fueled

Commercial Motor Vehicle Idling (13 CCR 2485) and the operation of poorly maintained equipment during construction, and no construction equipment is expected to use natural gas. Thus, construction of the proposed project or variant would not result in wasteful, inefficient, or unnecessary consumption of energy.

Operation

During the operational phase, the proposed project and variant would consume energy as a result of a number of residential project components and uses, including heating, cooling, landscaping activities, and vehicle trips. The proposed project and variant are expected to generate the same number of residents and therefore have identical operational energy demand. Natural gas use is assumed to be zero, as the project would not use natural gas on site.

Appendix F of the State CEQA Guidelines provides guidance on determining whether a project would result in wasteful, inefficient, or unnecessary consumption of energy resources. As stated in Appendix F, the goal of conserving energy implies the wise and efficient use of energy, and the means of achieving this goal includes the following.

- Decreasing overall per capita energy consumption.
- Decreasing reliance on fossil fuels such as coal, natural gas, and oil.
- Increasing reliance on renewable energy sources.

Default values from CalEEMod, which are generated by the model based on a project's location and land use type, were used to determine the proposed project's electricity use and adjusted to reflect the project's increased electricity consumption, consistent with California Air Pollution Control Officers Association (CAPCOA) methodology (CAPCOA 2021). The project would develop 40.2 acres, or 1,751,112 square feet, into 155 single-family homes with associated open space and infrastructure, including the athletic field changes. The project is anticipated to generate 388 onsite residents in the 155 new housing units. The project would adhere to the California Energy Code and CALGreen and incorporate water conservation measures, such as the potential use of artificial turf (natural grass may also be used instead), and energy-efficient design elements. The project and project variant would include drought-tolerant and/or native landscaping, water-conserving irrigation systems, including climate-sensitive controllers in common areas, and biological treatment of stormwater runoff, in addition to potentially using artificial turf on the recreational fields. All of these would decrease water use and subsequent energy use. The project could also achieve additional energy use reduction by implementing sustainability features such as rooftop solar equipment; however, these features were not quantified because the exact number of installed systems and affected structures are currently unknown. Thus, this analysis may overstate the project's actual operational energy impacts. Because existing energy use at the project site is unknown, no credit was given in these calculations to account for existing energy use.

The proposed project could increase energy use at the site by upwards of 962,477 kilowatt hours (kWh) per year. The city's General Plan assumes an increase in electricity consumption of 1,445,000 kWh/year, or 7,336 kWh each year per additional residence. The U.S. Energy Information Administration (EIA) determined the average annual electricity consumption by type of home and census region in 2015 and found that single-family detached homes' annual electricity consumption was 10,330 kwh/year and single-family attached homes' annual electricity consumption was 6,816 kWh/year (EIA 2015). The project estimates energy use of 6,209.5 kWh/year per housing unit, and electric vehicle (EV) chargers, if used by residents, could consume an additional 4,896 kWh/year per

vehicle charging station (EnergySage 2023). The household-specific energy consumption for the proposed project and project variant is below the household estimate included in the General Plan and the averages provided by the EIA. Electric vehicles are more efficient than their gasoline consuming counterpart; specifically, an EV electric drive system is only responsible for a 15 to 20 percent energy loss compared to 64 to 75 percent for a gasoline engine (U.S. Department of Energy 2023). The project, therefore, meets the goal in Appendix F of the State CEQA Guidelines of decreasing per capita energy consumption.

Greenhouse gas and air quality impacts associated with the increase in vehicle trips is discussed in Sections 3.7, *Greenhouse Gas Emissions,* and 3.2, *Air Quality*.

The General Plan also includes provisions for sustainable development standards and requires that all new residential development be pre-wired for optional photovoltaic roof energy systems and/or solar water heating, comply with the most recent Building Energy Efficiency Standards for Residential and Nonresidential buildings, incorporate passive heating and natural lighting strategies, utilize sustainable landscaping techniques to facilitate energy efficiency, distribute energy efficiency information to all residents, facilitate environmentally sensitive construction practices, and convert street lights and traffic signals to more efficient technologies, all of which the proposed project would comply with (City of San Bruno 2008). The proposed project would be an all-electric residential community, thereby reducing reliance on natural gas and increasing reliance on renewable energy. The project would include water-efficient native landscape and biological treatment of stormwater runoff and would reduce GHG emissions by omitting natural gas facilities. Each home would also include solar panels, energy-efficient appliances, and efficient insulation and cooling. Additionally, garages would have space for bicycle parking to allow alternative modes of transit for residents.

Although it is foreseeable that the existing sports leagues that use the recreational fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. Consequently, field lights could be on for longer periods of time if nighttime use becomes more frequent, increasing energy consumption. However, at this time, the City has no certain future users; therefore, the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined and further analyzed at this time. Motor vehicle trips associated with spectators to and from the recreational fields for sporting events and other activities would utilize energy in the form of petroleum products and electricity, although this is in line with the current vehicle energy use. There would be new vehicle trips associated with the additional residents and their EV charging stations, as discussed above. Non-electric vehicles may also be used by residents, but these trips must be viewed in context of broader energy use. Taking into the account the various energy uses and various measures to reduce energy use across the project site for the proposed development and activities, the proposed project and variant would not result in the wasteful, inefficient, or unnecessary consumption of energy, and energy use impacts would be **less than significant.**

Impact EN-2: Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency? (Less than Significant)

State and local renewable energy and energy efficiency plans that are applicable to the proposed project and variant are discussed under the *Regulatory Setting* section, above. State plans include AB 1493 Pavley Rules, California Title 24 energy efficiency standards, SB 350, and SB 100. Each of these contain required standards related to energy efficiency and renewable energy development.

Local plans that address energy efficiency and are designed to achieve the state's RPS mandates include PCE's 2018 Integrated Resource Plan and the San Mateo Energy and Water Strategy 2025. The City's General Plan also includes goals and policies that relate to energy use and reduction.

The proposed project and variant would encourage implementation of sustainability and transportation features, and energy use by square foot is below the General Plan estimates, as discussed above. The project and variant would be required to comply with state and local renewable energy and energy efficiency plans, including solar panels fitted on each new home. Vehicle type and energy use from increased vehicle miles traveled (VMT) and average daily trips (ADT) within the area are expected to become increasingly more efficient as a result of the regulations included in Pavley, which addresses average fuel economy and commercialization of zero-emissions vehicles. Building energy efficiency is also expected to increase as a result of compliance with Title 24 building codes, which are expected to move toward zero net energy for newly constructed buildings, and the shift toward 100 percent renewable energy under SB 350 and SB 100 regulations. As result, the proposed project and variant's impacts would be **less than significant.**

3.6 Geology, Soils, and Paleontological Resources

This section evaluates the project's potential environmental impacts on geologic resources. It first describes the existing geologic setting and resources of the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.6.1 Existing Conditions

Regulatory Setting

Federal

National Pollutant Discharge Elimination System Permit

The U.S. Environmental Protection Agency (EPA) has granted the State of California (the State Water Board and Regional Water Boards) primacy in administering and enforcing the provisions of Clean Water Act (CWA) and National Pollutant Discharge Elimination System (NPDES) permit. NPDES is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States. Generally, construction activities that disturb 1 acre of land or more are required to obtain coverage under the NPDES General Permit for Construction Activities (Construction General Permit). The Construction General Permit requires the applicant to file a notice of intent (NOI) to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP). The SWPPP includes a site map and a description of proposed construction activities, along with a demonstration of compliance with relevant local ordinances and regulations, and an overview of the best management practices (BMPs) that would be implemented to prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources.

State

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Earthquake Fault Zoning Act (California Public Resources Code [PRC] Section 2621 et seq.) is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (Earthquake Fault Zones). Under the Alquist-Priolo Act, faults are zoned and construction along or across them is strictly regulated if they are 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 purposes of the act as referring to approximately the last 11,000 years).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (PRC Section 2690–2699.6) aims to reduce damage resulting from earthquakes. The act addresses earthquake-related hazards other than surface fault rupture, including ground shaking, liquefaction, and seismically induced landslides. The state must identify and map areas at risk of strong ground shaking, liquefaction, landslides, and other hazards, and cities and counties must regulate development within mapped Seismic Hazard Zones. Permit review is the primary mechanism for local regulation of development under the Seismic Hazards Mapping Act.

California Building Code

The California Building Code (CBC) is included in Title 24 of the California Code of Regulations (CCR) and composes part of the California Building Standards Code. The CBC addresses reduction of earthquake risk to structures. Chapter 16 of the CBC deals with General Design Requirements, including, but not limited to, regulations governing seismically resistant construction (Chapter 16, Division IV) and construction to protect people and property from hazards associated with excavation cave-ins and falling debris or construction materials. Chapters 18 and A33 deal with site demolition, excavations, foundations, retaining walls, and grading, including requirements for seismically resistant design, foundation investigations, stable cut and fill slopes, and drainage and erosion control.

Local

2009 City of San Bruno General Plan

The current *City of San Bruno General Plan*, adopted in 2009, includes goals and policies associated with geology and soils (City of San Bruno 2009). The City of San Bruno General Plan has identified policies from Environmental Resources and Conservation, and Health and Safety element, related to geological resources. These goals and policies include guidelines for evaluating seismic safety and minimizing hazards related to ground shaking, liquefaction, landslides, and erosion. Policies specifically relevant to the project include the following.

- **Implementing Policy HS-3.** Requires geotechnical investigation of all sites, except single-family dwellings, proposed for development in areas where geologic conditions or soil types are subject to landslide risk, slippage, erosion, liquefaction, or expansive soils. (Requires submission of geotechnical investigation and demonstration that the project conforms to all recommended mitigation measures prior to City of San Bruno approval.)
- **Implementing Policy HS-4.** Prevent soil erosion by retaining and replanting vegetation, and by siting development to minimize grading and land form alteration.
- **Implementing Policy HS-5.** Requires preparation of a drainage and erosion control plan for land alteration and vegetation removal on sites greater than 10,000 square feet.
- **Implementing Policy HS-7.** Development in areas subject to seismic hazards, including ground shaking, liquefaction, and seismically-induced landslides (Figure 7-2) will comply with guidelines set forth in the most recent version of the California Division of Mines and Geology Special Publication 117.

- **Implementing Policy HS-18.** Require developers to implement erosion and sedimentation control measures to maintain an operational drainage system, preserve drainage capacity, and protect water quality.
- **Implementing Policy HS-22.** Require that construction-related grading and other activities comply with the Association of Bay Area Governments' (ABAG) Manual of Standards for Erosion and Sediment Control Measures and with the California Stormwater Quality Association (CASQA), Stormwater Best Management Practice Handbook for Construction.

City of San Bruno Municipal Code

Section 12.12.010 of the San Bruno Municipal Code sets forth the following general provisions, permitting requirements, grading regulations, and specific elements required in requested soil and engineering reports.

- An adequate description of the geology of the project site.
- Conclusions and recommendations regarding the effects of geologic conditions on the proposed development.
- Opinions and recommendations covering the adequacy of sites to be developed by the proposed grading.
- Data regarding the nature, distribution, strength, and in-place relative compaction of existing soils.
- Conclusions and recommendations for grading procedures and design criteria for corrective measures when necessary.
- Groundwater conditions.
- Data on erodibility of the soil.
- Draft specifications for erosion control measures. For purposes of such draft specifications, reference is made to the *Association of Bay Area Governments Manual for Surface Runoff Control Measures*, pages 1-45, through 1-151, inclusive. (Ord. 1369 § 1, 1981; prior code § 9-1.7(a))

City of San Bruno Building Code

The 2022 California Building Code has been adopted and incorporated into the City of San Bruno code, except that as part of the most recent update the City also proposed local codes and ordinances that are stricter than the state code.

Emergency Response Planning

San Mateo County drafted a Multijurisdictional Local Hazard Mitigation Plan in October 2021. The plan is designed to reduce the risk of hazards including earthquakes, major fires, and flooding. The draft plan is available for review on the county's website.[1]

[1] The plan is available for review at https://www.smcgov.org/ceo/2021-multijurisdictional-lhmp#:~:text=The%20Plan%20will%20enable%20the,public%20meetings%20to%20give%20input.

Environmental Setting

Regional Setting

The project site is in the Coast Ranges geomorphic province of California that is characterized by rugged northwest-trending mountain chains, valleys, and ridges. The predominant geologic structure and these topographic features are controlled by folds and faults that resulted from the collision of the Farallon plate and North American plate, and subsequent strike-slip faulting along the San Andreas fault system. The San Andreas fault is more than 600 miles long, from Point Arena in the north to the Gulf of California in the south. The Coast Ranges province is bordered on the east by the Great Valley and on the west by the Pacific Ocean.

The geologic structure in the area is dominated by the San Andreas and Serra faults. The Serra fault extends from Hillsborough to near Daly City. The fault lies approximately 0.9 mile to 1.9 miles northeast of the San Andreas fault, and because it dips toward the San Andreas fault, the two faults probably intersect at depth (Appendix E, *Final Geotechnical and Geological Investigation*). The bedrock in the area is mapped as Jurassic to late Cretaceous-age (200 to 65 million years ago [Ma]) Franciscan Complex consisting of sandstone, shale, chert, greenstone, and serpentinite, and Upper Pliocene-age (5.3 to 2.6 Ma) Merced Formation overlain by Quaternary-age (1.8 Ma to the present), Colma Formation, hill slope (colluvium), alluvium, landslide deposits, and artificial fill.

Project Site Geology

Much of the project site was previously graded as part of construction of the currently unoccupied Crestmoor High School and is, therefore, relatively level, with an increase in elevation from north to south. The area of proposed development has a grade change of approximately 44 feet, with the northern portion of the project site at 376 feet above mean sea level and the southern portion at 420 feet above mean sea level. However, hills along the western and southern portions of the project site are considerably sloped with approximately 100 feet of elevation change.

The project site is primarily underlain by the upper Pliocene Merced Formation. Test borings indicate the presence of moderately consolidated, friable, brownish yellow to dark gray silty sandstone and weakly consolidated, dense to very dense silty sand (Merced Formation) about 1 foot below ground surface (bgs). There are minor localized pockets of artificial fill along the west, east, and north ends of the prominent north–northeast-trending ridge that encompasses the site.

Strike and dip symbols on the available published geologic maps suggest that the prominent north–northeast-trending ridge is structurally characterized by north–northeast striking and steeply to vertical dipping beds that appear to be folded along the axis of the ridge. Furthermore, the geologic investigation observed near-vertical abrupt contacts of brownish-yellow silty sandstone over dark gray silty sandstone, and other structural indicators such as steeply dipping bedding planes and repeating and alternating strata units that suggest a north–northeast striking fold or folds encompassing the ridge underlying the site. Intensely deformed, steeply dipping strata and folding are likely the result of the proximity to and movement along the San Andreas and Serra faults, which are approximately 1,400 feet to the west and 410 feet to the east of the project site, respectively.

During the subsurface investigation at the site, up to about 8 feet of undocumented artificial fill overlying the bedrock across the project site was observed in two borings. The thicker accumulations of artificial fill appear to have been placed during the original grading of the site. The thickest accumulations of fill are in the topographically lower northwest part of the site along the

margins or upper breaks-in-slope that wrap around the northern half of the site, and at the arcuate heads of prominent drainages that extend down from the prominent ridge in the west and east.

Geologic Hazards

The results of the field investigation were used to evaluate the potential for ground surface rupture, landslides, liquefaction, lateral spreading, and cyclic densification on the project site.

Ground Shaking

Intensity of ground shaking depends on earthquake magnitude; distance from the fault source; the earthquake's directivity, or the focusing of earthquake energy along the fault in the direction of the rupture; and site-specific soil conditions. The western edge of the project site is about 1,800 feet from the San Andreas fault. Therefore, there is potential for a large earthquake to induce very strong to violent ground shaking at the project site during the life of the project (Appendix E, *Final Geotechnical and Geological Investigation*).

Ground Surface Rupture and Co-Seismic Ground Deformation

Historically, ground surface displacements closely follow the trace of geologically young faults. The project site is not within an Earthquake Fault Zone, as defined by the Alquist-Priolo Earthquake Fault Zoning Act, and no known active or potentially active faults exist on the site. As such, the risk of offset at the site from a known active fault is very low (Appendix E, *Final Geotechnical and Geological Investigation*).

Landslide Hazards

The western portion of the project site is mapped within an earthquake-induced landslide zone, per the California Geological Survey (CGS). Based on the geologic reconnaissance, the potential for landsliding at the project site, under both static and seismic conditions, is low because of the shallow depth of the bedrock and the shear strength of the soil above the bedrock. The project site is largely graded, and a prominent fill wedge wraps around the site. While it is likely that some perched groundwater exists above the native bedrock seasonally, lack of evidence of past slope instability in these areas throughout the project site and vicinity since at least since 1947 suggests that the grading and compaction around the perimeter of the site and the competence of the underlying soil has been affected little by the perched groundwater condition. Furthermore, groundwater was only encountered within one exploratory boring located near the middle of the upper field, suggesting the perched groundwater is localized and minor (Appendix E, *Final Geotechnical and Geological Investigation*).

During the project's geologic investigation, some evidence of surficial slope erosion on the western side of the project site was observed. Evidence of shallow slope instability was observed on the slope above properties 270 through 280 Madison Avenue. Photographs from 2005 show a landslide scare behind 340 Madison Avenue, with plastic sheeting visible in aerial photos from 2008. Later photos of the site show the sheeting gradually obscured by soil and/or vegetation. Most recent photos from September 2021 show no visible surficial slope movement at the location of the repair (Appendix E, *Final Geotechnical and Geological Investigation*).

The geotechnical report also included slope stability analyses. Based on those analyses, the existing slopes on and adjacent to the site are stable under both static and seismic conditions with estimated displacements of less than 8 inches near the tops of the slopes during a major earthquake. Following

periods of heavy rainstorms, localized slope shallow sloughing may develop due to concentrated groundwater flow along the soil/bedrock interface. However, these occasional surficial slope slips would not substantially impact the overall slope stability at the site (Appendix E, *Final Geotechnical and Geological Investigation*).

Liquefaction and Associated Hazards

Liquefaction is a phenomenon where loose, saturated, cohesionless soil experiences a temporary reduction in strength during cyclic loading, such as that produced by earthquakes. Lateral spreading is a phenomenon in which surface soil is displaced along a shear zone that has formed within an underlying liquefied layer. Upon reaching mobilization, the surficial blocks are transported downslope or in the direction of a free face by earthquake and gravitational forces. When a saturated, cohesionless soil liquefies, it experiences a temporary loss of shear strength created by a transient rise in excess pore pressure generated by strong ground motion. Soils susceptible to liquefaction include loose to medium-dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Flow failure, lateral spreading, differential settlement, loss of bearing strength, ground fissures, and sand boils are evidence of excess pore pressure generation and liquefaction.

The project site is not mapped within a liquefaction zone, per CGS. The results of the subsurface investigation indicate that specific locations on the site are blanketed by soil consisting of fill and/or native soil overlying bedrock. Neither the fill nor the native soil are susceptible to liquefaction because of their cohesion or relative density. Therefore, the potential for liquefaction and associated hazards (i.e., lateral spreading) to occur at the project site is very low (Appendix E, *Final Geotechnical and Geological Investigation*).

Cyclic Densification

Cyclic densification (also referred to as differential compaction) is a phenomenon in which nonsaturated, cohesionless soil is compacted by earthquake vibrations, causing ground-surface settlement. Cyclic densification of nonsaturated sand (sand above the groundwater table) can occur during an earthquake, resulting in settlement of the ground surface and overlying improvements. The results of the subsurface investigation indicate that the project site is underlain by medium-dense to very dense clayey sand and silty sand, as well as hard sandy clay overlying silty sandstone. These materials are not susceptible to cyclic densification due to their cohesion and/or relative density. Therefore, the potential for ground surface settlement at the site due to cyclic densification is very low (Appendix E, *Final Geotechnical and Geological Investigation*).

Expansive Soil

According to the *City of San Bruno General Plan*, the project site is not mapped on an area of expansive soil (City of San Bruno 2009: Figure 7-2).

Erosion

Erosion generally occurs on steeper slopes, particularly where unnatural slope cuts and grading have occurred. Much of the site is covered in buildings, asphalt, concrete, or vegetation (e.g., turf), limiting the potential for erosion on the site under current conditions. However, the site is mapped as an area that is susceptible to erosion (City of San Bruno 2009, Figure 7-2).

Paleontological Resources

As previously described, the project site is primarily underlain by the upper Pliocene Merced Formation. Test borings indicate the presence of moderately consolidated, friable, brownish yellow to dark gray silty sandstone and weakly consolidated, dense to very dense silty sand (Merced Formation) about 1 foot bgs. There are minor localized pockets of artificial fill along the west, east, and north ends of the prominent north–northeast-trending ridge that encompasses the site. The Merced Formation contains many fossils, although one resources notes that "most of them have no age significance" (Northern California Geological Society 2021).

3.6.2 Environmental Impacts

Methods for Analysis

The impact analysis for geology, soils, and paleontological resources is based on information from review of technical reports and documents pertaining to the project site including CGS technical maps and guides, as well as project-specific studies. The analysis is also informed by the provisions and requirements of federal, state, and local laws and regulations that apply to geologic resources.

In *California Building Industry Association v. Bay Area Air Quality Management District*, the California Supreme Court held that CEQA generally does not require an evaluation of impacts of the environment on the users or occupants of a project unless a project would risk exacerbating an existing environmental hazard. Therefore, the impact analysis is focused on whether the proposed project would exacerbate existing conditions related to geologic hazards.

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. Additional use of the field would have no additional impacts related to geology, soils, and paleontology because those resources are not affected differently by intensity of use of the recreational fields. Increased use would not change the size, location, or design of facilities, and therefore would not involve excavation, grading, or other activities that could potentially impact geology, soils, and paleontological resources. Therefore, the potential for increased use, the amount and types of which are currently undefinable, is not analyzed further.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the following conditions.

- Impact GEO-1: 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 California State Geologist for the area or based on other substantial evidence of a known fault.
    - Strong seismic ground shaking.
    - Seismic-related ground failure, including liquefaction.
    - Landslides.

- Impact GEO-2: Substantial soil erosion or the loss of topsoil.
- Impact GEO-3: Placement of project-related facilities on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Impact GEO-3: Placement of project-related facilities 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.
- Impact GEO-4: Placement of project facilities on soils 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.
- Impact GEO-5: Direct or indirect destruction of a unique paleontological resource or site or unique geologic feature.

Impacts

Impact GEO-1: Would the project result in potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides? (No Impact)

The project site is considered subject to strong to very strong ground shaking due to its proximity to the San Andreas fault. Generally, types of activities that exacerbate seismic conditions are very limited and include activities such as groundwater injection. The project and the project variant would not involve these kinds of activities during construction or operation and, therefore, would not exacerbate existing seismic conditions nor would there be any increase in indirect seismicity impacts, such as fault rupture, ground shaking, liquefaction, or landslides. There would be **no impact**.

Impact GEO-2: Would the project result in substantial soil erosion or the loss of topsoil? (Less than Significant)

Construction

Construction activities associated with both the residential component and recreation area would temporarily expose soils and increase the potential for soil erosion from wind or stormwater runoff. Construction activities at both the recreation facility and in the residential area would disturb more than 1 acre of soil, so that both would require coverage under the statewide Construction General Permit. Coverage under the Construction General Permit requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP would be required to identify temporary BMPs to prevent the transport of earthen materials from construction sites during periods of precipitation or runoff, and temporary BMPs would be required to prevent wind erosion of earthen materials. Mandatory compliance with adopted regulations would require the project to minimize erosion and loss of topsoil during construction.

Operation

Once homes are constructed and landscaping is installed, the possibility of erosion would be reduced. In addition, once the turf is installed on the proposed field, all exposed soil materials in that

area would be covered or otherwise held in place with grass, and there would be limited potential for soil erosion to occur. Additionally, the project design would follow recommendations outlined in the project-specific geotechnical report (Appendix E, *Final Geotechnical and Geological Investigation*). This would include protecting fill slopes against erosion by hydroseeding or hydromulching with deeply rooted, fast-growing vegetation after construction is complete. If that vegetation would not establish prior to rains, the recommendation is to protect slopes using measures like hay bales and silt fences (Appendix E). Operations and maintenance would not require additional soil disturbance other than for small-scale landscape maintenance activities and would not result in erosion or loss of topsoil. Construction and operation activities that can result in erosion would be the same under the proposed project and the project variant.

The construction-related and operation impacts would be **less than significant**.

Impact GEO-3: Would the project result in the placement of project-related facilities on a geologic unit or soil that is unstable or has expansive soil or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse? (Less than Significant)

As discussed previously, the potential for landsliding at the project site, under both static and seismic conditions, is low. While it is likely that some perched groundwater exists above the native bedrock, it appears that the grading and compaction around the perimeter of the project site and the competence of the underlying soil has been affected little by the perched groundwater condition. The project site is not mapped within a liquefaction zone, and the subsurface investigation indicates that neither the fill nor the native soil are susceptible to liquefaction because of their cohesion or relative density. The area is not mapped as having expansive soil.

Additionally, the project design would follow recommendations outlined in the project-specific geotechnical report (Appendix E, *Final Geotechnical and Geological Investigation*). This would include recommendations regarding using engineered fill slopes as well as conducting remedial grading to remove disturbed soil that extends below proposed improvements and backfilling the resulting excavations with compacted engineered fill. Additionally, the geotechnical report recommends that the proposed residential buildings and stormwater basin be set back at least 8 feet from the tops of slopes (Appendix E). The project design would also comply with standard engineering and seismic safety design techniques, in accordance with the CBC, as well as applicable Building and Fire Codes adopted by the City of San Bruno to address site-specific geologic conditions. The stormwater features would be retention vaults and would not discharge water into the subgrade, so that the risk of slope instability would be low. The project would not exacerbate existing geologic hazard conditions. Construction and operation activities that can affect geologic and soil stability would be the same under the proposed project and the project variant.

The construction-related and operation impacts would be **less than significant**.

Impact GEO-4: Would the project result in placement of facilities on soils 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? (No Impact)

The project and the project variant would not include septic tanks or alternative wastewater disposal systems. There would be **no impact**.

Impact GEO-5: Would the project result in direct or indirect destruction of a unique paleontological resource or site or unique geologic feature? (Less than Significant with Mitigation)

While there are no known paleontological resources or unique geologic features on the project site, the site is underlain by the Merced Formation. This geologic unit is known to contain fossils. As a result, ground-disturbing activities such as grading and excavation in areas with native substrate may destroy or damage paleontological resources. This construction-related impact would be the same under the proposed project and the proposed variant. No impacts are expected as a result of project operations because no additional excavation would be conducted during operation. Construction-related impacts would be **potentially significant**.

Implementation of Mitigation Measure GEO-5 would ensure that workers are informed of the procedures to follow should they encounter subsurface paleontological resources. It also ensures that work is halted until all appropriate procedures are followed in the event that paleontological resources are discovered. Mitigation Measure GEO-5 would reduce impacts from ground-disturbing activities under the project and the project variant. Impacts would be **less than significant with mitigation**.

Mitigation Measure GEO-5: Provide Construction Personnel Training and Follow Unanticipated Paleontological Resources Discovery Protocol.

Prior to commencement of ground-disturbing activities, project personnel conducting ground-disturbing activities shall receive training regarding the potential for uncovering subsurface paleontological resources (a fossilized bone or other preserved plant or animal remains), work practices for implementing mitigation measures and complying with applicable laws and regulations, and how to recognize possible buried resources. The training shall include a presentation of procedures to follow upon discovery or suspected discovery of paleontological resources, their treatment (described below) and actions that may be taken if there is violation of applicable laws.

If a previously undiscovered paleontological resource is encountered during construction, ground-disturbing activity within 100 feet of the resource shall be stopped. A qualified paleontological resource specialist shall be retained to assess the significance of the find. An exclusion area shall be established with signage and protective barriers. Entry into the area shall be limited to authorized personnel and a qualified paleontological resource specialist, and the contractor shall immediately notify the City of San Bruno. Preservation in place (avoidance) is preferred mitigation for impacts on unique paleontological resources. No additional mitigation is necessary if the resource can be avoided, but the qualified paleontological resource specialist shall document the resource in accordance with professional standards such as the *Society of Vertebrate Paleontology Standard of Procedures for the Assessment of Adverse Impacts to Paleontological Resources* (SVP 2010). A significant paleontological resource under these standards is defined as follows.

> Significant paleontological resources are fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years).

Work can resume if there is no potential for the resource to be a unique paleontological resource. If there is a potential for the resource to be a unique paleontological resource and it cannot be avoided, the qualified paleontological resource specialist shall identify mitigation measures, which may include ensuring that fossils are recovered, prepared, identified, catalogued, and analyzed consistent with current professional standards. Methods of recovery, testing, and evaluation shall adhere to current professional standards such as the *Society of Vertebrate Paleontology Standard of Procedures for the Assessment of Adverse Impacts to Paleontological Resources* (SVP 2010). Work can commence after data recovery.

3.7 Greenhouse Gas Emissions

This section evaluates the project's potential environmental impacts related to greenhouse gas (GHG) emissions. It first describes the existing setting related to greenhouse gases and climate change and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.7.1 Existing Conditions

Regulatory Setting

Federal

Several federal executive orders (EO) have recently been signed by President Joe Biden related to GHG emissions and climate resiliency. EO 13990, signed in January 2021, set a national goal to achieve a 50 to 52 percent reduction from 2005 levels in economy-wide net GHG pollution in 2030. EO 14057, signed in December 2021, requires federal agencies to develop strategic processes for achieving, among other things, carbon-free electricity by 2030 and 100 percent zero-emission vehicle (ZEV) acquisitions by 2035. President Biden has also signed two bills—the Infrastructure Investment and Jobs Act (2021) and Inflation Reduction Act (2022)—that provide funding for infrastructure improvements that will reduce GHG emissions and bolster resilience to climate change. Despite these actions, there is currently no federal law or legislatively mandated national GHG reduction target.

Corporate Average Fuel Economy Standards

The National Highway Traffic Safety Administration's (NHTSA's) Corporate Average Fuel Economy (CAFE) standards require substantial improvements in fuel economy and reductions in GHG emissions generated by passenger cars and light-duty trucks sold in the United States. On August 2, 2018, the United States Environmental Protection Agency (EPA) and NHTSA proposed amendments to the current fuel efficiency standards for passenger cars and light-duty trucks and new standards for model years 2021 through 2026. Under the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule, current 2020 standards would be maintained through 2026.

On September 19, 2019, EPA and NHTSA issued a final action on the One National Program Rule, which is considered Part One of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards, withdrawing California's Clean Air Act (CAA) preemption waiver to set state-specific standards.[1] The EPA reinstated California's authority under the CAA to implement its own

[1] The One National Program Rule enabled EPA and NHTSA to provide nationwide uniform fuel economy and GHG vehicle standards by (1) clarifying that federal law preempts state and local tailpipe GHG standards, (2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and (3) withdrawing California's CAA preemption waiver to set state-specific standards.

GHG emissions standards and ZEV sales mandate on March 9, 2022.[2] The current CAFE standards require an industry-wide fleet average of approximately 49 miles per gallon (mpg) for passenger cars and light trucks in model year 2026, by increasing fuel efficiency by 8 percent annually for model years 2024 and 2025, and 10 percent annually for model year 2026 (U.S. Department of Transportation 2021).

State

Statewide GHG Emissions Targets and the Climate Change Scoping Plan

California has adopted statewide legislation addressing various aspects of climate change and GHG emissions mitigation. Much of this legislation establishes a broad framework for the state's long-term GHG reduction and climate change adaptation program. Senate Bill (SB) 32 requires the state to reduce emissions to 40 percent below the 1990 level by 2030. Assembly Bill (AB) 1279 requires California to achieve net zero GHG emissions (i.e., reach a balance between the GHGs emitted and removed from the atmosphere) no later than 2045 and to achieve and maintain net negative GHG emissions from then on. It also mandates an 85 percent reduction in statewide anthropogenic GHG emissions (from 1990 levels) by 2045. SB 1203 requires state agencies to aim to achieve net-zero GHG emissions resulting from their operations no later than 2035, or as soon as feasible thereafter.

The state's plan to reach these targets is presented in periodically updated scoping plans. The California Air Resources Board (CARB) adopted the 2017 Climate Change Scoping Plan in November 2017 to meet the GHG reduction requirement set forth in SB 32 (CARB 2017a). It proposed continuing the major programs of the previous Scoping Plan, including the Cap-and-Trade Regulation; low carbon fuel standards; more efficient cars, trucks, and freight movement; Renewables Portfolio Standard (RPS); and reducing methane emissions from agricultural and other wastes. In December 2022, CARB adopted its Final 2022 Scoping Plan Update for Achieving Carbon Neutrality (2022 Scoping Plan), which identifies a technologically feasible, cost-effective, and equity-focused path to achieve carbon neutrality by 2045, pursuant to AB 1279 (CARB 2022b). The plan also assesses the state's progress towards meeting the GHG emissions reduction goal called for in SB 32.

The state has also passed the following, more detailed, legislation to address GHG emissions associated with transportation, electricity generation, and energy consumption.

Vehicle Efficiency and Zero-Emissions Standards

AB 1493 (Pavley I) required CARB to develop and implement regulations to reduce automobile and light-truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. Additional strengthening of the Pavley standards (referred to previously as Pavley II and now referred to as the Advanced Clean Cars measure) was adopted for vehicle model years 2017–2025 in 2012. Together, the two standards are expected to increase average fuel economy to roughly 54.5 mpg in 2025.

[2] California, 22 other states, the District of Columbia, and two cities filed suit against Part One of the SAFE Vehicles Rule on September 20, 2019 (*California et al. v. United States Department of Transportation et al.,* 1:19-cv-02826, U.S. District Court for the District of Columbia). On December 12, 2021, NHTSA repealed the SAFE Vehicles Rule, Part One.

In August 2022, CARB voted to approve the Advanced Clean Cars II proposal, which would dramatically reduce emissions from passenger cars for model years 2026 through 2035. This requires an increasing proportion of new vehicles to be ZEVs, with the goal of 100 percent ZEVs for new vehicles sold by 2035 (CARB 2022a).

CARB also adopted the Advanced Clean Truck Regulation to accelerate a large-scale transition of medium- and heavy-duty ZEVs. The regulation requires the sale of medium- and heavy-duty ZEVs as an increasing percentage of total annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55 percent of Class 2b–3 truck sales, 75 percent of Class 4–8 straight truck sales, and 40 percent of truck tractor sales. By 2045, every new medium- and heavy-duty truck sold in California would be zero-emission. Large employers including retailers, manufacturers, brokers, and others are required to report information about shipments and shuttle services to better ensure that fleets purchase available zero-emission trucks.

Low Carbon Fuel Standard

With EO S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard (LCFS) for California in 2007, leading to approval of the LCFS regulation in 2009. In 2018, CARB approved amendments to the regulation strengthening the carbon intensity benchmarks through 2030 in line with California's 2030 SB 32 GHG emissions reduction target (CARB 2023). Under the LCFS, the carbon intensity of California’s transportation fuels is to be reduced by at least 20 percent by 2030.

Legislation Associated with Electricity Generation

The state passed legislation that requires increasing use of renewables to produce electricity for consumers. Specifically, California utilities are required to generate 52 percent of their electricity from renewables by 2027 (SB 100), 60 percent by 2030 (SB 100), 90 percent by 2035 (SB 1020), 95 percent by 2040 (SB 1020), and 100 percent by 2045 (SB 100/SB 1020). SB 1020 also requires state agencies to rely on 100 percent renewable energy and zero-carbon resources to serve their own facilities by 2030.

Building Energy Efficiency Standards (Title 24, Part 6)

The energy consumption of new residential and nonresidential buildings in California is regulated by the California Code of Regulations (CCR), Title 24, Part 6, Building Energy Efficiency Standards (California Energy Code). The California Energy Commission (CEC) updates the California Energy Code every 3 years with more stringent design requirements to reduce energy consumption, resulting in lower GHG emissions. The 2022 California Energy Code, which took effect on January 1, 2023, requires builders to use more energy-efficient building technologies to comply with requirements regarding energy use.

Regional

Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) is the metropolitan planning organization for the nine counties that make up the San Francisco Bay Area and the San Francisco Bay Area Air Basin (SFBAAB), including the city of San Bruno. The first per capita GHG emissions reduction targets for the SFBAAB were 7 percent by 2020 and 15 percent by 2035 relative to 2005 levels. In 2013, MTC adopted a Sustainable Communities Strategy (SCS) as part of its Regional Transportation Plan (RTP)

for the SFBAAB. This was known as Plan Bay Area. The plan goes beyond regional per capita targets and calls for 10 and 16 percent reductions in per capita GHG emissions by 2020 and 2035, respectively (MTC/ABAG 2013). On July 26, 2017, the strategic update to this plan, known as Plan Bay Area 2040, was adopted by the Association of Bay Area Governments (ABAG) and the MTC. As a limited and focused update, Plan Bay Area 2040 builds upon the growth pattern and strategies developed in the original Plan Bay Area but with updated planning assumptions that incorporate the key economic, demographic, and financial trends since 2013 (MTC/ABAG 2017). As required by SB 375, CARB updated the per capita GHG emissions reduction targets in 2018. The new targets (i.e., reductions in per capita GHG emissions of 10 percent by 2020 and 19 percent by 2035 relative to 2005 levels) are addressed in the latest update to Plan Bay Area, Plan Bay Area 2050, which was approved by ABAG and the MTC in October 2021. Plan Bay Area 2050 carries forward many of the development and funding strategies of Plan Bay Area 2040 (MTC/ABAG 2021).

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the primary agency responsible for addressing air quality concerns in the San Francisco Bay Area, including San Mateo County. Its role is discussed further in Section 3.3, *Air Quality*. BAAQMD also recommends methods for analyzing project-related GHGs in CEQA analyses as well as multiple GHG reduction measures for land use development projects.

BAAQMD formally adopted new California Environmental Quality Act (CEQA) GHG thresholds and released its *Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans* (BAAQMD Justification Report) in April 2022 (BAAQMD 2022). These update the CEQA GHG thresholds from the 2017 CEQA Guidelines, which were not consistent with the statewide GHG target established by SB 32. The new CEQA GHG thresholds presented in the BAAQMD Justification Report are included in the most recent version of BAAQMD's CEQA Air Quality Guidelines. These new GHG thresholds of significance were updated to consider newer state reduction targets (e.g., SB 32) and eventual carbon neutrality by 2045 (e.g., EO B-55-18), as well as evolving case law. In summary, the updated thresholds emphasize (1) avoiding wasting electricity and developing fossil fuel infrastructure in new buildings that will be in place for decades and thus conflict with carbon neutrality by 2045; (2) compliance with the 2022 California Green Building Standards Code, Title 24, Part 11 (CALGreen) Tier 2 electric vehicle requirements and per capita vehicle miles traveled (VMT) reductions consistent with SB 743; and (3) consistency with a qualified greenhouse reduction strategy (also known as a Climate Action Plan).

BAAQMD published the most recent version of the CEQA Air Quality Guidelines in April 2023 (2022 CEQA Guidelines). The 2022 CEQA Guidelines include guidance for evaluating plan- and project-level air quality and climate impacts, as well as best practices for centering environmental justice, health, and equity thresholds for evaluating a project's impact on air quality (BAAQMD 2023). The evidence provided in the BAAQMD Justification Report underpins the air district's updated GHG thresholds and recommendations for assessing project-level climate impacts provided in the 2022 CEQA Guidelines.

This analysis was prepared consistent with guidance and recommendations from the most recent 2022 CEQA Guidelines.

Local

City of San Bruno General Plan

The San Bruno General Plan, adopted in 2009, includes goals and policies that relate to climate change and GHG emissions reduction (City of San Bruno 2009). The General Plan includes the following goals and policies associated with climate change and GHG emissions reductions.[3]

- **ERC-28.** Incorporate air quality beneficial programs and policies into local planning and development activities, with a particular focus on subdivision, zoning, and site design measures that reduce the number and length of single-occupant automobile trips.
- **ERC-30.** Encourage new residential developments to incorporate measures such as shuttle services to major employment centers, commercial areas and transit areas, and provision of adequate transit facilities.
- **ERC-33.** Require all large construction projects to mitigate diesel exhaust emissions through use of alternate fuels and control devices.

In addition, the San Bruno General Plan has identified Land Use and Urban Design, Transportation, Open Space and Recreation, Environmental Resources and Conservation, Health and Safety, and Public Facilities and Services policies related to climate change and sustainability. Though these policies do not directly address GHG emissions, they aim to promote sustainable development practices such as protecting the natural environment, encouraging mixed-used development, and implementing best management practices (e.g., water conservation). These sustainability practices may contribute to GHG emissions reduction. The project's consistency with applicable goals and policies in the General Plan is evaluated in Section 3.6, *Land Use*.

City of San Bruno Reach Code

As part of the 2022 California Energy Code update, as described above, the City has adopted local amendments related to building electrification and electric vehicle infrastructure that are more stringent than the State's adopted standards. These amendments are codified in the City's Municipal Code, Chapters 11.06 and 11.07.

Environmental Setting

Global Climate Change

The process known as the *greenhouse effect* keeps the atmosphere near Earth's surface warm enough for the successful habitation by humans and other life forms. The greenhouse effect is created by sunlight that passes through the atmosphere. Some of the sunlight striking Earth is absorbed and converted to heat, which warms the surface. The surface emits a portion of this heat as infrared radiation, some of which is re-emitted toward the atmosphere by GHGs. Human activities that generate GHGs increase the amount of infrared radiation absorbed by the atmosphere, thereby enhancing the greenhouse effect and amplifying the warming of Earth.

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution (IPCC 2007). Rising atmospheric

[3] The city's General Plan also includes policies associated with Transportation, encouraging transportation alternatives, such as walking, bicycling, carpooling, transit-ridership, and flex-scheduling, which reduce transportation-related GHG emissions.

concentrations of GHGs, in excess of natural levels, have resulted in increasing global surface temperatures—a process commonly referred to as *global warming*. Higher global surface temperatures have, in turn, resulted in changes to Earth's climate system, including increases in ocean temperature and acidity, reduced sea ice, variable precipitation, and increases in the frequency and intensity of extreme weather events (IPCC 2018a). Large-scale changes to Earth's climate system are collectively referred to as *climate change.*

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that human-induced warming reached approximately 1 degree Celsius (°C) above pre-industrial levels in 2017 and is increasing at a rate of 0.2°C per decade. Under the current nationally determined contributions of mitigation from each country until 2030, global warming is expected to rise to 3°C by 2100 and continue afterward (IPCC 2018a). Large increases in global temperatures could have substantial adverse impacts on the natural and human environments in California and worldwide.

Greenhouse Gases

The principle anthropogenic (human-made) GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride, hydrofluorocarbons (HFCs), and perfluorocarbons. The primary GHGs that would be emitted by project-related construction and operations include CO_2, CH_4, and N_2O.

Carbon dioxide enters the atmosphere through the combustion of fossil fuel (i.e., oil, natural gas, coal), solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., from manufacturing cement). CO_2 is also removed from the atmosphere, or *sequestered*, when it is absorbed by plants as part of the biological carbon cycle.

Methane is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and agricultural practices as well as the anaerobic decay of organic waste in municipal solid waste landfills.

Nitrous oxide is emitted by agricultural and industrial activities as well as the combustion of fossil fuels and solid waste.

Methods have been set forth to describe emissions of GHGs in terms of a single gas to simplify reporting and analysis. The most commonly accepted method for comparing GHG emissions is the global warming potential (GWP) methodology defined in IPCC reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2. By definition, CO_2 has a GWP of 1.

Table 3.7-1 lists the global warming potential of CO_2, CH_4, and N_2O and their lifetimes in the atmosphere.

Table 3.7-1. Lifetimes and Global Warming Potentials of Key Greenhouse Gases

Greenhouse Gas	Global Warming Potential (100 years)	Lifetime (years)
Carbon dioxide (CO_2)	1	--[a]
Methane (CH_4)	25	12
Nitrous oxide (N_2O)	298	114

Source: CARB 2020

[a] No lifetime (years) for CO_2 was presented by CARB.

CARB recognizes the importance of reducing emissions of short-lived climate pollutants to achieve the state's overall climate change goals. Short-lived climate pollutants have atmospheric lifetimes on the order of a few days to a few decades, and their relative climate-forcing impacts, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2 (CARB 2017b). Given their short-term lifespan and warming impact, short-lived climate pollutants are measured in terms of CO_2e using a 20-year time period. The use of GWPs with a time horizon of 20 years captures the importance of the short-lived climate pollutants and gives a better perspective as to the speed at which emissions controls will affect the atmosphere relative to CO_2 emissions controls. CH_4 has a lifetime of 12 years and a 20-year GWP of 72. HFC gases have lifetimes of 1.4 to 52 years and a 20-year GWP of 437 to 6,350. Anthropogenic black carbon has a lifetime of a few days to weeks and a 20-year GWP of 3,200 (CARB 2017b).

Greenhouse Gas Reporting

A GHG inventory is a quantification of all GHG emissions and sinks[4] within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a building or person). Several agencies have developed emissions inventories, which provide comprehensive accounts of total GHG emissions at varying scales, and tools for quantifying emissions from specific sources. Table 3.7-2 shows results of the most current emissions inventories at the international, national, state, regional, and city levels, as quantified by the IPCC, EPA, CARB, BAAQMD, and the City of San Bruno, respectively.

Table 3.7-2. Global, National, State, and Local GHG Emissions Inventories

Emissions Inventory	CO_2e (metric tons)
2017 IPCC Global GHG Emissions Inventory	53,500,000,000
2021 EPA National GHG Emissions Inventory	6,340,200,000
2020 CARB State GHG Emissions Inventory	369,200,000
2011 BAAQMD GHG Emissions Inventory	86,600,000
2015 City of San Bruno GHG Emissions Inventory	248,098

Sources: IPCC 2018b; EPA 2023; CARB 2022d; BAAQMD 2011; County of San Mateo n.d.

Potential Climate Change Effects

Climate change is a complex process that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result in sea level rise, both globally and in San Francisco Bay, as well as changes in climate and rainfall, among other effects,

[4] A GHG sink is a process, activity, or mechanism that removes a GHG from the atmosphere.

there remains uncertainty about characterizing precise local climate characteristics and predicting precisely how various ecological and social systems will react to changes in the existing climate at the local level. Regardless of this uncertainty, it is widely understood that substantial climate change has occurred and will continue to occur in the future, although the precise extent will take further research to define. Specifically, the effects from global climate change in California and worldwide include the following.

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates, with a corresponding increase in atmospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures (CNRA 2018).
- Rising average global sea levels, due primarily to thermal expansion in the oceans and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets (IPCC 2018a).
- Changing weather patterns, including changes in precipitation and wind patterns, and more energetic episodes of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and intense tropical cyclones (IPCC 2018a).
- Declining Sierra Nevada snowpack levels, which account for approximately half of the surface water storage in California. Snow levels could decline by 70 to as much as 90 percent over the next 100 years (CNRA 2018).
- Increases in the number of days that could be conducive to ground-level ozone formation (e.g., clear days with intense sunlight) by the end of the 21st century in areas with high levels of ozone. The number of days could increase by 25 to 85 percent, depending on the future temperature scenario (CNRA 2018).
- Increases in the potential for erosion of California's coastlines as well as seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level (CNRA 2018).
- Exacerbation of the severity of drought conditions in California (e.g., durations and intensities could be amplified, ultimately increasing the risk of wildfires and consequential damage) (CNRA 2018).
- Under changing climate conditions, experience lower agricultural crop yields due to extreme heat waves, heat stress, increased water needs of crops and livestock (particularly during dry and warm years), and new and changing pest and disease threats (CNRA 2018).

The impacts of climate change, such as increases in the number of heat-related events, droughts, and wildfires, pose direct and indirect risks to public health, with people experiencing worsening episodes of illness and earlier deaths. Indirect impacts on public health include increases in incidents of vector-borne diseases, stress, and mental trauma due to extreme events and disasters, economic disruptions, and residential displacement (CNRA 2018).

3.7.2 Environmental Impacts

Methods for Analysis

Construction

Short-term GHG emissions generated by project construction were calculated using CalEEMod Version 2022.1, which uses vehicle emissions factors from CARB's EMFAC2021, as recommended

by BAAQMD and other air districts in California (CAPCOA 2022). Emissions would be released in the form of exhaust from off-road equipment; exhaust from employee vehicles, vendor trucks, and haul trucks; and indirect GHG emissions from electricity consumption.

Modeling was based on project-specific information where available, including demolition quantities, building types and sizes, expected construction phase durations, and the area to be graded or paved; assumptions for construction activities, such as the equipment inventory and number of truck trips; and default values from CalEEMod, which are generated by the model based on a project's location and land use type. Detailed model assumptions and inputs for the calculations can be found in Appendix B, *Air Quality and Greenhouse Gas Emissions*.

Operations

During operations, the largest source of GHG emissions would be motor vehicles traveling to and from the project site. These emissions were estimated using traffic data provided by Fehr & Peers (2023) and CalEEMod, which uses vehicle emissions factors from CARB's EMFAC2021. The traffic data was entered into the mobile-source module of CalEEMod to estimate GHG emissions resulting from project-related vehicle trips.

GHG emissions associated with water consumption, electricity use, solid waste generation, landscape maintenance, and refrigerant use were estimated using the corresponding modules of CalEEMod. Emissions associated with onsite water consumption were estimated using water consumption data provided by West Yost and default assumptions from CalEEMod (West Yost 2022). Default waste generation rates in CalEEMod were used to estimate GHG emissions from waste generation. GHG emissions associated with consumption of natural gas were assumed to be zero, as the project would not use natural gas on site. For the project's electricity consumption, the default CalEEMod values were adjusted to reflect the project's electricity consumption, consistent with CAPCOA methodology (CAPCOA 2021). Carbon intensity factors for Peninsula Clean Energy (PCE), which would supply electricity to the project site, are included in CalEEMod for multiple years.[5] For the project analysis, the PCE GHG intensity factors used to model emissions represent the first year of full buildout (2026). As PCE's electricity products will be carbon-free in 2026, the corresponding GHG intensity factors are zero, so the project's electricity consumption would not be a source of GHG emissions (PCE n.d.).

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. Increased use of the field facilities could result in additional vehicle trips to and from the project site, as well as corresponding increases in GHG emissions. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and therefore cannot be further analyzed.

All GHG calculations and modeling data are provided in Appendix B, *Air Quality and Greenhouse Gas Emissions*.

[5] As PCE is San Mateo County's default electricity provider, as discussed in Section 3.5, *Energy*, it is reasonably assumed that PCE would supply electricity to the project site.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant impact if it would result in any of the following conditions.

- Impact GHG-1: Generation of greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

State CEQA Guidelines Section 15064.4(b) also states that, when assessing the significance of impacts from GHG emissions, a lead agency should consider (1) the extent to which a project may increase or reduce GHG emissions compared with existing conditions, (2) whether a project's GHG emissions would exceed a threshold of significance that the lead agency has determined to be applicable to the project, and (3) the extent to which a project would comply with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. These three factors are considered when identifying an appropriate approach to determine the significance of the project's construction and operational GHG emissions.

Construction-generated Emissions of Greenhouse Gases

The BAAQMD's CEQA Guidelines or Justification Report do not identify a GHG emissions threshold for construction-related emissions (BAAQMD 2022, 2023). Nonetheless, BAAQMD's 2022 CEQA Guidelines recommend the quantification and disclosure of construction GHG emissions. Even though the significance of construction GHG emissions is not determined, the 2022 State CEQA Guidelines provide best management practices (BMPs) that projects should incorporate to reduce construction GHG emissions (BAAQMD 2023).

Operational Emissions of Greenhouse Gases

According to the Justification Report, BAAQMD recommends that the evaluation of land-use projects focus on a project's impact on California's efforts to meet the state's long-term climate goals. If a project would contribute its "fair share"[6] of what will be required to achieve those long-term climate goals, then a reviewing agency can find that the impact would not be significant because the project would help to solve the problem of global climate change (BAAQMD 2022). Applying this approach, BAAQMD has found that a new land use development project being built today needs to incorporate the design elements provided in Table 3.7-3 to do its "fair share" toward meeting the SB 32 2030 target and the goal of carbon neutrality by 2045.

[6] The BAAQMD defines "fair share" as the design elements that need to be incorporated into a project to lay the foundation for achieving carbon neutrality by 2045. These design elements are elements that the project has influence or control over. For example, becoming carbon neutral by 2045 will require California's electrical power generators to shift to 100-percent carbon-free energy resources, which is not something that can be controlled through the design of new land use projects, and would not be a part of a project's fair share. Other sources that would not be part of the "fair share" is vehicle fleet mix or indirect offsite emissions (e.g., methane emissions from wastewater or solid waste).

Table 3.7-3. BAAQMD GHG Thresholds for Land Use Projects

Thresholds for Land Use Projects (Must Include A or B)
A. Projects must include, at a minimum, the following project design elements: 1. Buildings a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development). b. The project will not result in any wasteful, inefficient, or unnecessary electrical usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines. 2. Transportation a. Achieve compliance with electric vehicle requirements in the most recently adopted version of CALGreen Tier 2. b. Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA: i. Residential projects: 15 percent below the existing VMT per capita ii. Office projects: 15 percent below the existing VMT per employee iii. Retail projects: no net increase in existing VMT
B. Projects must be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).

Source: BAAQMD 2022.

If a project is designed and built to incorporate the design elements listed in Table 3.7-3 (Threshold Option A) or is consistent with a local GHG reduction strategy under Section 15183.5 of the State CEQA Guidelines (Threshold Option B), then it would contribute its portion of what is necessary to achieve California's long-term climate goals—its "fair share"—and would not make a cumulatively considerable contribution to global climate change. If the project does not incorporate these design elements and is not consistent with a local GHG reduction strategy, then it should be found to have a significant climate impact because it would hinder the state's efforts to address climate change.

Because the City of San Bruno does not have a Climate Action Plan that is considered a local GHG reduction strategy per Section 15183.5 of the State CEQA Guidelines, this analysis evaluates the project's consistency with the BAAQMD land use GHG thresholds (Threshold Option A) to determine the significance of the project's GHG emissions.

Impacts

Impact GHG-1: Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? (Significant and Unavoidable)

Construction

Project construction activities would include demolition, rough grading, utility construction, paving activities, and vertical construction. These activities would require the operation of mobile and stationary construction equipment and on-road vehicles, including haul trucks for demolition debris removal, vendor trucks for deliveries, and employee vehicles. Construction equipment and activities

for the project variant would be the same as the proposed project. Off-road equipment and on-road vehicles would generate exhaust emissions during the construction period. Construction GHG emissions from each source vary substantially depending on the specific construction phase, daily construction operations, types of equipment, and number of personnel. Based on modeling conducted with CalEEMod, it is estimated that project-related construction would generate approximately 828 $MTCO_2e$ over the construction period (2024–2026). See Appendix B, *Air Quality and Greenhouse Gas Emissions*, for detailed input parameters and modeling results.

As noted, BAAQMD has not established a quantitative threshold for assessing construction GHG emissions, noting that the emissions are temporary and variable (BAAQMD 2023). Thus, the significance of the project's GHG impact is determined based on the potential for project operation to generate GHG emissions. Nonetheless, as described in Chapter 2, *Project Description*, SummerHill Homes (the project sponsor) has indicated that it will incorporate the following BAAQMD-recommended BMPs to reduce GHG emissions associated with construction of the proposed residential uses.

- Require all diesel-fueled off-road construction equipment be equipped with EPA Tier 4 Final compliant engines or better as a condition of contract, though there may be times when equipment may not be Tier 4 compliant.
- Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 2 minutes (A 5-minute limit is required by the state airborne toxics control measure [Title 13, Sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site and develop an enforceable mechanism to monitor idling time to ensure compliance with this measure.
- Prohibit off-road diesel-powered equipment from being in the "on" position for more than 10 hours per day.
- Require all construction equipment to be maintained and properly tuned in accordance with manufacturer's specifications. Equipment should be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Where grid power is available, prohibit portable diesel engines and provide electrical hook ups for electric construction tools, such as saws, drills and compressors, and use electric tools whenever feasible.

The GHG emissions were calculated without implementation of these BMPs.

Operation

The primary source of emissions during project operation would be mobile-source GHG emissions from vehicles traveling to and from the project site (i.e., project-generated VMT). Other sources of emissions include landscaping equipment, offsite electricity consumption associated with supplying water as well as conveying and treating wastewater, and the generation of solid waste.

Although the quantity of operational GHG emissions from the project is not directly used to evaluate GHG impacts because BAAQMD land use Threshold Option A is being used to determine the significance of the project's GHG emissions, annual emissions generated by project operation were estimated to provide a fully comprehensive assessment. In the first year of full buildout (conservatively 2026 for the purposes of this analysis, but anticipated to be 2027), project operation would be expected to generate the highest quantity of annual operational emissions. Emissions in subsequent years would continually decrease, as the statewide vehicle fleet transitions to new,

lower-carbon emitting vehicles. Table 3.7-4 shows the estimated annual GHG emissions associated with project operation in 2026. As previously noted, GHG emissions associated with onsite consumption of natural gas were assumed to be zero, as the project would not use natural gas on site. The model output files and reports are provided in Appendix B, *Air Quality and Greenhouse Gas Emissions*.

Table 3.7-4. Operational Greenhouse Emissions by Sector for 2026 ($MTCO_2e$)

Emissions Source	Annual GHG Emissions[a] ($MTCO_2e$)
Mobile Sources	1,480
Area Sources	2
Energy Use[b]	--
Water Use	2
Solid Waste Generation	25
Refrigerants	<1
Total Operational Emissions	1,509

Source: Appendix B, *Air Quality and Greenhouse Gas Emissions*.

[a] Values may not sum due to rounding.

[b] As noted, the project would be all-electric, and PCE would supply electricity to the project site. As PCE's electricity products will be carbon-free in 2026 (conservatively for this analysis the first year of full buildout), the project's electricity consumption would not be a source of GHG emissions (PCE n.d.).

As shown in Table 3.7-4, the project would generate approximately 1,509 $MTCO_2e$ during its first year of full-buildout operation. As noted, these emissions quantities are not directly used to evaluate GHG impacts but are included here for informational purposes. A discussion of the project's consistency with the BAAQMD land use thresholds, used to evaluate the significance of the project's operational GHG impacts, follows.

BAAQMD Land Use Thresholds

This analysis evaluates the project's consistency with the BAAQMD land use Threshold Option A to determine the significance of the project's GHG emissions. The project's consistency with these requirements is discussed in Table 3.7-5.

As demonstrated in Table 3.7-5, the project would not be consistent with all BAAQMD land use Threshold Option A design elements, because the project would not achieve a reduction in project-generated VMT of 15 percent below the regional average.

As described in Impact TRA-2 in Section 3.15, *Transportation*, there are very few available mitigation options to reduce project-generated VMT given the project's location (Fehr & Peers 2023). The project is located in a primarily single-family residential, high-VMT area without high-quality transit lines or convenient walking or biking options to access shopping, work, education, or other opportunities. Furthermore, while there is evidence that building active transportation and transit improvements can reduce VMT, the City does not currently have a program to administer offsite improvements. Thus, this would not be a feasible mitigation option. As described in Impact TRA-2, mitigation measure TRA-2 would require that a Transportation Demand Management (TDM) program be prepared for the project, but the associated reductions are not sufficient to reduce project-generated VMT below the threshold. There are no additional measures to reduce project-generated VMT and associated GHG emissions.

Table 3.7-5. Project Consistency with BAAQMD GHG Land Use Thresholds

BAAQMD Threshold	Project Consistency
Sector – Buildings	
The project will not include natural gas appliances or natural gas plumbing (in either residential and nonresidential development)	**Consistent.** As part of the project design, the project would not include natural gas appliances or natural gas plumbing. As such, the project would be consistent with this BAAQMD requirement.
The project will not result in any wasteful, inefficient, or unnecessary electrical usage as determined by the analysis required under CEQA Section 21100(b)(2) and Section 15126.2(b) of the State CEQA Guidelines.	**Consistent.** As determined in Section 3.5, *Energy*, the project was found not to result in wasteful, inefficient, or unnecessary consumption of energy resources. Furthermore, the project would be an all-electric residential community, and each home would include solar panels as well as energy-efficient electric appliances, windows, insulation, and heating, ventilation, and air conditioning (HVAC) systems. Water heating systems will be all-electric as well. The project thus includes several design features that would directly minimize wasteful or inefficient energy use. As such, the project would be consistent with this BAAQMD requirement.
Sector – Transportation	
Achieve compliance with electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.	**Consistent.** For the purposes of evaluating GHG impacts, the project is compared to the CALGreen Section A4.106.8, electric vehicle (EV) charging requirements for new residential development. For single-family residential dwellings, CALGreen Tier 2 requires that each dwelling unit be provided with circuitry capable of supporting electric vehicle charging, as specified in Title 24, Part 11, and identified as "EV Ready" in the service panel or subpanel. As part of the project design, each of the project's 155 single-family homes would have an attached garage equipped with one Level 2 EV Ready space and one Level 1 EV Ready space. The project would thus go beyond the CALGreen Tier 2 EV requirements. As such, the project would be consistent with this BAAQMD requirement.
Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT Target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA: Residential projects: 15 percent below the existing VMT per capita. Office projects: 15 percent below the existing VMT per employee Retail projects: no net increase in existing VMT	**Inconsistent**. As described in Impact TRA-2 in Section 3.15, *Transportation*, the project's estimated VMT would be 14.7 daily miles per resident, accounting for the fact that the project includes affordable units and increases the residential density of the neighborhood. Nonetheless, project-generated VMT would exceed the threshold of 12.4 daily miles per resident, or 15 percent below the regional average VMT for the region of 14.6 daily miles per resident. At 14.7 miles per resident, the project would result in a rate of VMT that exceeds the regional average by 0.1 mile per capita and exceeds the threshold by 2.3 miles per capita. Thus, the project would not result in a VMT reduction relative to the regional average; rather, it would result in a VMT increase. Additionally, no mitigation is available to reduce this impact to less than significant. As such, the project would be inconsistent with this BAAQMD requirement.

Source: BAAQMD 2022.

Therefore, even with implementation of a TDM program through mitigation measure TRA-2, the Project would result in a cumulatively considerable impact with respect to operational GHG emissions, and there are no feasible mitigation measures to reduce this impact. This impact would be **significant and unavoidable.**

Impact GHG-2: Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases? (Significant and Unavoidable)

Consistency with the CARB 2022 Scoping Plan

As explained in the *Regulatory Setting* section, CARB's 2022 Scoping Plan outlines the main strategies for California to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030, as well as to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels (CARB 2022b). Appendix D to CARB's 2022 Scoping Plan, *Local Actions*, identifies key project attributes that empirical evidence shows reduce operational GHG emissions while simultaneously advancing fair housing. CARB concludes that "[r]esidential and mixed-use projects that have all of the key project attributes in Table 3 [Key Residential and Mixed-Use Project Attributes that Reduce GHGs] should accommodate growth in a manner consistent with state GHG reduction and equity prioritization goals" (CARB 2022c). As a result, this analysis evaluates the project's consistency with the Scoping Plan–identified key project attributes to determine whether the project would conflict with the state's plan for meeting its GHG reduction targets. The project's consistency with these attributes is discussed in Table 3.7-6.

Table 3.7-6. Project Consistency with CARB 2022 Scoping Plan Key Project Attributes

Project Attribute	Project Consistency
Transportation Electrification	
Provides EV charging infrastructure that, at minimum, meets the most ambitious voluntary standard in the California Green Building Standards Code at the time of project approval	**Consistent.** As discussed under Impact GHG-1, the proposed project would exceed the voluntary Tier 2 standards for EV charging infrastructure under the 2022 CALGreen code. As such, the project would be consistent with this attribute.
VMT Reduction	
Is located on infill sites that are surrounded by existing urban uses and reuses or redevelops previously undeveloped or underutilized land that is presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer)	**Consistent**. The project site is located in an existing residential area and currently contains the former, currently unoccupied Crestmoor High School, as well as playing fields (currently used), parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. Thus, the project site is presently served by existing utilities and essential public services. In addition, the project site falls within the Rural Urban Boundary, as defined by MTC (MTC/ABAG 2022). Therefore, the project would redevelop previously undeveloped or underutilized land that is presently served by existing utilities and essential public services. As such, the project would be consistent with this attribute.

Project Attribute	Project Consistency
Does not result in the loss or conversion of natural and working lands	**Consistent**. The project site is located in an existing residential area and currently contains the former, currently unoccupied Crestmoor High School, as well as playing fields (currently used), parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. The project would include vegetation management along the sloping wooded open space, but the project would maintain it as open space. As such, the project would not result in the loss or conversion of natural and working lands and would be consistent with this attribute.
Consists of transit-supportive densities (minimum of 20 residential dwelling units per acre), or Is in proximity to existing transit stops (within a half mile), or Satisfies more detailed and stringent criteria specified in the region's SCS.	**Consistent**. The project site is located approximately 0.5 miles from the bus stop at Whitman Way and Shelter Creek Lane serviced by samTrans, Route 142 (SFO – Shelter Creek) (samTrans 2023). The project would thus be in proximity (i.e., within 0.5 miles) of an existing transit stop. It should be noted that portions of the project site are farther than 0.5 miles from the bus stop, such as the units in Neighborhood 2 and some units in the southern portion of Neighborhood 1. However, most of the Neighborhood 1 units are within 0.5 miles of the bus stop. As such, the project would be consistent with this attribute.
Reduces parking requirements by: Eliminating parking requirements or including maximum allowable parking ratios (i.e., the ratio of parking spaces to residential units or square feet); or Providing residential parking supply at a ratio of less than one parking space per dwelling unit; or For multifamily residential development, requiring parking costs to be unbundled from costs to rent or own a residential unit.	**Inconsistent**. The project proposes the development of 155 single-family homes, and the project sponsor cannot eliminate parking requirements and does not have control over the allowable parking ratios at the project site. Thus, the project would need to provide residential parking supply at a ratio of less than one parking space per dwelling unit to be consistent with this attribute. However, the project would provide 310 covered garage and 310 driveway apron parking spaces, for a parking supply ratio of 4 parking spaces per dwelling unit. As such, the project would be inconsistent with this attribute.
At least 20 percent of units included are affordable to lower-income residents	**Inconsistent**. The project includes 24 onsite below market rate ("BMR") homes (8 at low-income levels and 16 at moderate income levels, for a total of 15 percent of affordable units) distributed throughout the two neighborhoods, which would not meet the threshold of 20 percent of affordable units. As a result, the project would be inconsistent with this attribute.
Results in no net loss of existing affordable units	**Consistent**. The existing project site does not currently provide any residential units, and 24 of the project's homes would be affordable at low- or moderate-income levels; thus, the project would

Project Attribute	Project Consistency
	result in a net increase in affordable units. As such, the project would be consistent with this attribute.
Building Decarbonization	
Uses all-electric appliances without any natural gas connections and does not use propane or other fossil fuels for space heating, water heating, or indoor cooking	**Consistent**. As part of the project design, the project would use all-electric appliances without any natural gas connections and would not use fossil fuels for space heating, water heating, or indoor cooking. As such, the project would be consistent with this project attribute.

Source: CARB 2022c.

As discussed in Table 3.7-6, the project would not be consistent with all CARB-identified project attributes. Specifically, the project would not provide residential parking supply at a ratio of less than one parking space per dwelling unit. It would not be feasible to reduce the residential parking supply at the project site, as described in Impact TRA-2. Moreover, the project would not meet the Scoping Plan–identified affordable housing standard. Thus, the project would be inconsistent with two of the CARB-identified project attributes related to VMT reduction.

As described under Impact GHG-1, there are very few available mitigation options to reduce project-generated VMT given the project's location. A TDM program would be prepared for the project per mitigation measure **TRA-2.** However, the associated reductions are not sufficient to reduce project-generated VMT below the threshold, and there are no additional measures to reduce project-generated VMT and associated GHG emissions.

Therefore, the project would conflict with the Scoping Plan, and the impact with respect to applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions would be **significant and unavoidable.**

California Senate Bill 375/Plan Bay Area 2050

Plan Bay Area 2050, the RTP/SCS for the San Francisco Bay Area, was prepared by MTC pursuant to the requirements of SB 375, as discussed in the *Regulatory Setting* section. Plan Bay Area 2050 is a state-mandated, integrated long-range transportation and land use plan that demonstrates reductions in GHG emissions from passenger cars and light-duty trucks (CARB 2018).

Plan Bay Area 2050 highlights the importance of achieving a more balanced distribution of jobs and housing across the region. In San Mateo County, where the project site is located, there are more jobs than housing; intensified growth in the county would make it possible for more people to live near their workplaces (MTC/ABAG 2021). Strategies EN4 and H5 call for maintaining urban growth boundaries and integrating affordable housing into all major housing projects (MTC/ABAG 2021). Consistent with these strategies, the project would advance the Plan Bay Area 2050 objectives by siting new development within the existing urban footprint (EN4) and integrating below market rate (BMR) housing. Specifically, the project would develop 155 single-family homes, including 24 BMR homes, on the project site. In addition, the project site is located approximately 0.5 mile from the bus stop at Whitman Way and Shelter Creek Lane serviced by samTrans, Route 142 (SFO – Shelter Creek) (samTrans 2023). Although portions of the project site are farther than 0.5 mile from the bus stop much is within a 0,5 mile. The project would thus be in proximity (i.e., within 0.5 mile) of an existing transit stop. Thus, the project advances the Plan Bay Area 2050 goals by developing market-rate and BMR residential dwelling units on a site within the existing urban growth boundary

that offers access to transit, promoting a more balanced distribution of jobs and housing across the region.

In addition, as described in Impact TRA-1 in Section 3.15, the project is consistent with Plan Bay Area 2050, as the project's proposed uses and size fits within the envelope of the uses proposed in that plan.

Conclusion

Plan Bay Area 2050 is the applicable regional plan to reduce mobile source emissions in the San Francisco Bay Area. As noted, the project would be consistent with Plan Bay Area 2050 by advancing the goals set out by the plan and constructing new development consistent with the land uses proposed in the plan.

CARB's 2022 Scoping Plan identifies the state's path to keep California on track to meet its SB 32 GHG reduction target of at least 40 percent below 1990 emissions by 2030, as well as to achieve carbon neutrality by 2045 and a reduction in anthropogenic emissions by 85 percent below 1990 levels. The project would not be consistent with CARB's 2022 Scoping Plan, as it would not incorporate all of the Scoping Plan–identified project attributes. There are no feasible mitigation measures to reduce project-generated VMT. As a result, operation of the project would not be consistent with CARB's 2022 Scoping Plan.

Therefore, the project would conflict with state, regional, or local plans to achieve the GHG reduction goals mandated by SB 32 for the year 2030 and AB 1279 for the year 2030 and 2045. This impact would be **significant and unavoidable**.

3.8 Hazards and Hazardous Materials

This section evaluates the project's potential environmental impacts related to hazards and hazardous materials. It first describes the existing hazards in the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.8.1 Existing Conditions

Regulatory Setting

For purposes of this section, the term *hazardous materials* refers to hazardous substances and hazardous wastes. A hazardous material is defined in the Code of Federal Registrations (C.F.R.) as "a substance or material that … is capable of posing an unreasonable risk to health, safety, and property when transported in commerce" (49 C.F.R. § 171.8). California Health and Safety Code Section 25501 defines a hazardous material as follows.

> "Hazardous material" means any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

"Hazardous wastes" are defined in California Health and Safety Code Section 25141(b) as wastes that:

> …because of their quantity, concentration, or physical, chemical, or infectious characteristics, [may either] cause, or significantly contribute to an increase in mortality or an increase in serious illness [or] pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Federal

Management of Hazardous Materials

Various federal laws address the proper handling, use, storage, and disposal of hazardous materials, as well as requiring measures to prevent or mitigate injury to health or the environment if such materials are accidentally released. The U.S. Environmental Protection Agency (EPA) is the agency primarily responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. Applicable federal regulations pertaining to hazardous materials are primarily contained in C.F.R. Titles 29, 40, and 49. Hazardous materials, as defined in the C.F.R., are listed in Title 49 Section 172.101. Management of hazardous materials is governed by the following laws.

- The Toxic Substances Control Act of 1976 (15 U.S. Code [U.S.C.] Section 2601 et seq.) regulates the manufacturing, inventory, and disposition of industrial chemicals, including hazardous

materials. Section 403 of the Toxic Substances Control Act establishes standards for lead-based paint hazards in paint, dust, and soil.

- The Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6901 et seq.) is the law under which EPA regulates hazardous waste from the time the waste is generated until its final disposal ("cradle to grave").
- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (also called the Superfund Act or CERCLA) (42 U.S.C. § 9601 et seq.) gives EPA authority to seek out parties responsible for releases of hazardous substances and ensure their cooperation in site remediation.
- The Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499; U.S.C. Title 42, Chapter 116), also known as SARA Title III or the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), imposes hazardous materials planning requirements to help protect local communities in the event of accidental release.
- The Spill Prevention, Control, and Countermeasure (SPCC) rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. The SPCC rule is part of the Oil Pollution Prevention regulation, which also includes the Facility Response Plan rule.

Transport of Hazardous Materials

The U.S. Department of Transportation regulates transport of hazardous materials between states and is responsible for protecting the public from dangers associated with such transport. The federal hazardous materials transportation law, 49 U.S.C. § 5101 et seq. (formerly the Hazardous Materials Transportation Act, 49 U.S.C. § 1801 et seq.) is the basic statute regulating transport of hazardous materials in the United States. Hazardous materials transport regulations are enforced by the Federal Highway Administration, the U.S. Coast Guard, the Federal Railroad Administration, and the Federal Aviation Administration (FAA).

Worker Safety

The federal Occupational Safety and Health Administration (OSHA) is the agency responsible for assuring worker safety in the handling and use of chemicals identified in the Occupational Safety and Health Act of 1970 (Public Law 91-596, 9 U.S.C. § 651 et seq.). OSHA has adopted numerous regulations pertaining to worker safety, contained in C.F.R. Title 29. These regulations set standards for safe workplaces and work practices, including standards relating to the handling of hazardous materials and those required for excavation and trenching.

Airspace Restrictions

FAA regulation 14 C.F.R. Part 77 requires notification of any construction or alteration that would result in a structure being greater than 200 feet (61 meters) above ground level from its base or that would exceed a specified height from an imaginary slope from the nearest runway. The imaginary slope described below is measured from the nearest point of the nearest runway to the proposed structure.

- For airports with a runway greater than 3,200 feet (975 meters) in length, 1 vertical foot (0.3 meter) for every 100 horizontal feet (30 meters) for a horizontal distance of 20,000 feet (6,096 meters).

- For airports with a runway 3,200 feet (975 meters) or less in length, 1 vertical foot (0.3 meter) for every 50 horizontal feet (15 meters) for a horizontal distance of 10,000 feet (3,048 meters).
- For heliports, 1 vertical foot (0.3 meter) for every 25 horizontal feet (8 meters) for a horizontal distance of 5,000 feet (1,524 meters).

State

Management of Hazardous Materials

In California, federal and state community right-to-know laws are coordinated through the Governor's Office of Emergency Services. The federal law, SARA Title III or EPCRA encourages and supports emergency planning efforts at the state and local levels and to provide local governments and the public with information about potential chemical hazards in their communities. Because of the community right-to-know laws, information is collected from facilities that handle (e.g., produce, use, store) hazardous materials above certain quantities. The provisions of EPCRA apply to four major categories.

- Emergency planning.
- Emergency release notification.
- Reporting of hazardous chemical storage.
- Inventory of toxic chemical releases.

The corresponding state law is Chapter 6.95 of Division 20 of the California Health and Safety Code, *Hazardous Materials Release Response Plans and Inventory*. Under this law, qualifying businesses are required to prepare a Hazardous Materials Business Plan, which would include hazardous materials and hazardous waste management procedures and emergency response procedures, including emergency spill cleanup supplies and equipment. At such time as the applicant begins to use hazardous materials at levels that reach applicable state and/or federal thresholds, the plan is submitted to the administering agency.

The California Department of Toxic Substances Control (DTSC), a division of the California Environmental Protection Agency, has primary regulatory responsibility over hazardous materials in California, working in conjunction with EPA to enforce and implement hazardous materials laws and regulations. As required by Section 65962.5 of the California Government Code, DTSC maintains a hazardous waste and substances site list for the state, known as the Cortese List. Individual regional water quality control boards (Regional Water Boards) are the lead agencies responsible for identifying, monitoring, and cleaning up leaking underground storage tanks (LUSTs). The San Francisco Bay Regional Water Board has jurisdiction over the project site.

Transport of Hazardous Materials and Hazardous Materials Emergency Response Plan

The State of California has adopted U.S. Department of Transportation regulations for the movement of hazardous materials originating within the state and passing through the state; state regulations are contained in Title 26 of the California Code of Regulations (CCR). State agencies with primary responsibility for enforcing state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and the California Department of Transportation. Together, these agencies determine container types used and license hazardous waste haulers to transport hazardous waste on public roads.

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local governments and private agencies. Response to hazardous materials incidents is one part of the plan. The plan is managed by the Governor's Office of Emergency Services, which coordinates the responses of other agencies in the project area.

Management of Construction Activities

Through the Porter-Cologne Water Quality Act (Porter-Cologne) and the National Pollution Discharge Elimination System (NPDES) program, Regional Water Boards have the authority to require proper management of hazardous materials during project construction. For a detailed description of Porter-Cologne, the NPDES program, and the role of the San Francisco Bay Regional Water Board, see Section 3.9, *Hydrology and Water Quality*.

The State Water Resources Control Board (State Water Board) adopted the statewide NPDES General Permit in August 1999. The state requires that projects disturbing more than 1 acre of land during construction file a Notice of Intent with the Regional Water Board to be covered under this permit. Construction activities subject to the General Permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce nonstormwater discharges to storm sewer systems and other waters. A stormwater pollution prevention plan (SWPPP) must be developed and implemented for each site covered by the permit. The SWPPP must include best management practices (BMPs) designed to prevent construction pollutants from contacting stormwater and keep products of erosion from moving off site into receiving waters throughout the construction and life of the project; the BMPs must address source control and, if necessary, pollutant control.

Worker Safety

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations within the state. Cal/OSHA standards are typically more stringent than federal OSHA regulations and are presented in Title 8 of the CCR. Cal/OSHA conducts onsite evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

Title 8 of the CCR also includes regulations that provide for worker safety when blasting and explosives are utilized during construction activities. These regulations identify licensing, safety, storage, and transportation requirements related to the use of explosives in construction.

California Fire Code

The California Fire Code is found in CCR Title 24, Part 9, and is also referred to as the California Building Standards Code. The California Fire Code incorporates the Uniform Fire Code with necessary California amendments. It prescribes regulations consistent with nationally recognized good practices for the safeguarding—to a reasonable degree—of life and property from the hazards of fire, explosion, and dangerous conditions arising from the storage, handling, and use of hazardous materials and devices and from conditions hazardous to life or property in the use or occupancy of buildings or premises and provisions to assist emergency response personnel.

Cortese List (Government Code Section 65962.5)

The provisions of Government Code Section 65962.5 are commonly referred to as the Cortese List. The provisions require DTSC, the State Water Board, the California Department of Public Health, and

the California Department of Resources Recycling and Recovery to submit information pertaining to sites associated with solid waste disposal, hazardous waste disposal, LUST sites, and/or hazardous materials releases to the Secretary of California Environmental Protection Agency.

Local

San Bruno General Plan

The San Bruno General Plan, adopted March 2009, contains the following policies that directly or indirectly related to hazards and hazardous materials related to the project.

- **HS-24** Control the transport of hazardous substances to minimize potential hazards to the local population. Identify appropriate regional and local routes for transportation of hazardous materials and require that fire and emergency personnel can easily access these routes for response to spill incidents.
- **HS-28** Require that lead-based paint and asbestos surveys be conducted by qualified personnel prior to structural demolition or renovation, in buildings constructed prior to 1980.
- **HS-29** Require abatement of lead-based paint and asbestos prior to structural renovation and demolition, and compliance with all State, Federal, OSHA, Bay Area Air Quality Management District, and San Mateo County Health, Environmental Health Division rules and regulations.

San Bruno Multijurisdictional Local Hazard Mitigation Plan 2021

Beginning in February 2021, a partnership of 36 local governments and special districts in San Mateo County began working together to update the San Mateo County Multijurisdictional Local Hazard Mitigation Plan. The Plan will enable the jurisdictions to use pre- and post-disaster financial assistance to reduce the risk of natural hazards to people who live in the County. The 2021 plan update includes an assessment of risks related to climate change and human-caused risks such as terrorism, cyber threats, communication failures, and technological hazards including hazardous materials release.

Asbestos Containing Materials and Lead-Based Paint

Asbestos cleanup is regulated by federal and state laws that include the Clean Air Act and Cal-OSHA. Both the federal OSHA and Cal-OSHA regulate worker exposure during construction activities that affect lead-based paint, including demolition, removal, surface preparation for repainting, renovation, cleanup, and routine maintenance.

Bay Area Air Quality Management District

BAAQMD adopts rules and regulations to improve existing and future air quality. The proposed project may be subject to the following BAAQMD rule related to asbestos.

- Regulation 11, Rule 2 (Hazardous Pollutants—Asbestos Demolition, Renovation, and Manufacturing). This regulation, which incorporates EPA's asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations, controls emissions of asbestos to the atmosphere during demolition, renovation, and transport activities.

Comprehensive Airport Land Use Compatibility Plan

The proposed project site is inside Airport Influence Area B as defined by the Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport (SFO ALUCP). Each airport/land use compatibility plan (ALUCP) is required to contain policies and

criteria to address three key issues: (a) aircraft noise impacts, (b) safety compatibility criteria, and (c) height of structures/airspace protection (Ricondo Associates 2012).

San Mateo County Emergency Operations Plan

The County's Department of Emergency Management (DEM) coordinates countywide preparedness, response and protection services, and activities for large-scale incidents and disasters. DEM is responsible for alerting and notifying appropriate agencies within the county's 20 cities of disasters; coordinating all agencies that respond, ensuring resources are available and mobilized in times of disaster; developing plans and procedures in response to and recovery from disasters; and developing and providing preparedness materials for residents (County of San Mateo 2023).

Environmental Setting

Project Area

The project site is not located on a contaminated site pursuant to Government Code Section 65962.5.

The high school buildings are currently unoccupied. While no specific contaminant releases have been identified, a potential release of fluids from previously utilized hydraulic lifts within a former on-property auto shop and asphalt patched area in the parking lot between Buildings C and E is of concern. The high school housed industrial arts shops while it was in operation, from 1957 through 1980. One of these shops functioned as an automotive shop, where automotive repair services were taught. Petroleum products were likely heavily utilized in the auto shop during this time. Two former hydraulic lifts were observed in the building floor, as well as floor drains. Petroleum products could have been released to the subsurface, therefore the former auto shop is considered a Recognized Environmental Condition (REC). The reason for the asphalt patch was not known and could have indicated a current or former underground storage tank. To address the environmental concern presented by the former on-property auto shop and asphalt patched area in the parking lot between Buildings C and E, Roux Associates Inc. (Roux) conducted a limited Phase II investigation for the project in March 2022. The express purpose was to assess concentrations of total petroleum hydrocarbons and volatile organic compounds (VOCs) in soil beneath the former auto shop. Concentrations of VOCs detected in soil at all three sampling locations beneath the former auto shop and asphalt patch in the parking lot between Buildings C and E were less than the San Francisco Bay Regional Water Board residential environmental screening levels (ESLs), resolving any concerns related to the former auto shop and asphalt patch (Roux 2022).

Much of the property proposed for development is strewn with various debris and materials from previous site operations, but hazardous materials were not found in amounts greater than what might be expected from regular operation and maintenance activities. Minor amounts of cleaning supplies, batteries, and science chemicals were observed in various buildings of the property. A kiln for ceramics was also observed in Building D of the property (Roux 2022).

Lead-based paint or asbestos may be present in structures on the project site. In general, structures constructed before December 31, 1978, are at risk for lead-based paint. In addition, asbestos-containing materials (ACMs) can be present in thermal systems insulation, as well as wall and floor materials. Asbestos is a naturally occurring fibrous material used as a fireproofing and insulating agent in building construction before such uses were banned by EPA in the 1970s. Asbestos and lead-based paint can seep into the soil and/or be released into the air, providing a potential threat to

the health of workers, as well as persons in the vicinity. Because the buildings on the site were constructed before these dates, there is a risk they contain asbestos and lead-based paint.

The property has an active listing as a small quantity generator (1 to 199 pounds per month) of medical waste, primarily pertaining to biology class lab waste, such as from animal dissections; a listing for generating and recycling waste oil/solvent (less than 27 gallons per year) and storing hazardous materials (less than 21 gallons, 1,999 pounds, or 879 cubic feet); and an inactive listing for a stormwater annual inspection fee (inspected every 2 years) associated with San Mateo County Business Inventory (Roux 2022).

Adjacent Areas

A record search with the Groundwater Ambient Monitoring and Assessment Program (GAMA) Groundwater Information System found no monitoring wells within a 0.25-mile radius of the property. The closest designated contaminated site is Junipero Serra Park, located approximately 500 feet east of the project site, and was noted in a historical underground storage tank (UST) database for having a 550-gallon UST containing unleaded motor vehicle fuel in 1988 with a visual leak detection. No other sites were found to pose a risk to the project site (Roux 2022).

Airports

The closest airport to the project is SFO, which is located adjacent to San Bruno, just east of Highway 101. SFO is approximately 1.6 miles east of the project site and has a total of four runways (City of San Bruno 2009). The project is inside the Airport Influence Area (AIA) B as defined by the SFO ALUCP (Sinha 2023). The policy that applies in AIA B is (C/CAG 2012).

> **IP-2, Airport Influence Area B – Policy/Project Referral Area:** Within Area B, the Airport Land Use Commission (the C/CAG Board) shall exercise its statutory duties to review proposed land use policy actions, including new general plans, specific plans, zoning ordinances, plan amendments and rezonings, and land development proposals. The real estate disclosure requirements in Area A also apply in Area B. For the purposes of this policy, parcels along the edge of the Area B Boundary that are split by the boundary shall be considered as fully being within Area B.

Additionally, policy AP-4 outlines other potential land uses with hazards as being incompatible with AIA Area B (C/CAG 2012).

> **AP-4, Other Flight Hazards are Incompatible:** Proposed land uses with characteristics that may cause visual, electronic, or wildlife hazards, particularly bird strike hazards, to aircraft taking off or landing at the Airport or in flight are incompatible in Area B of the Airport Influence Area. They may be permitted only if the uses are consistent with FAA rules and regulations. Proof of consistency with FAA rules and regulations and with any performance standards cited below must be provided to the Airport Land Use Commission (C/CAG Board) by the sponsor of the proposed land use action.
>
> Specific characteristics that may create hazards to aircraft in flight and which are incompatible include:
>
> (a) Sources of glare, such as highly reflective buildings or building features, or bright lights, including search lights or laser displays, which would interfere with the vision of pilots making approaches to the Airport.
>
> (b) Distracting lights that could be mistaken by pilots on approach to the Airport for airport identification lighting, runway edge lighting, runway end identification lighting, or runway approach lighting.
>
> (c) Sources of dust, smoke, or water vapor that may impair the vision of pilots making approaches to the Airport.

(d) Sources of electrical interference with aircraft or air traffic control communications or navigation equipment, including radar.

(e) Land uses that, as a regular byproduct of their operations, produce thermal plumes with the potential to rise high enough and at sufficient velocities to interfere with the control of aircraft in flight. Upward velocities of 4.3 meters (14.1 feet) per second at altitudes above 200 feet above the ground shall be considered as potentially interfering with the control of aircraft in flight.

(f) Any use that creates an increased attraction for wildlife, particularly large flocks of birds, that is inconsistent with FAA rules and regulations, including, but not limited to, FAA Order 5200.5A, Waste Disposal Sites On or Near Airports, FAA Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants On or Near Airports, and any successor or replacement orders or advisory circulars. Exceptions to this policy are acceptable for wetlands or other environmental mitigation projects required by ordinance, statute, court order, or Record of Decision issued by a federal agency under the National Environmental Policy Act.

The proposed project is not located within any of the safety compatibility zones. The critical aeronautical surface in the project area is 860 feet above mean sea level (amsl). These surfaces protect airspace required for multiple types of flight procedures (C/CAG 2012).

Schools

The closest schools to the project site are John Muir Elementary School and Parkside Middle School, which are located approximately 1 mile northwest and northeast, respectively, of the project site.

Wildfire Hazard Severity

The proposed project is not located within a fire hazard severity zone (FHSZ) in a California State Resources Area. However, the California Department of Forestry and Fire Protection designates the area adjacent to the project site as a wildland urban interface (WUI) area. WUI is an area within or adjacent to an "at-risk community" or an area that is conducive to a large-scale wildland fire disturbance event. The area to the west located approximately 2 to 4 miles from the project site is designated as very high FHSZ. The project site is in an urban area where susceptibility to wildfire hazards is similar to that of the city as a whole given its development; however, there are some adjacent natural areas that could accommodate wildfire spread. Topography is relatively flat with surrounding unimproved sloping wooded open space. The sloped areas on the west side of the campus have been minimally maintained and are densely wooded, dominated by Monterey pine and red gum eucalyptus trees with a dense shrub layer. Additional wildfire information is provided in Section 3.18, *Wildfire*.

3.8.2 Environmental Impacts

Methods for Analysis

This section evaluates the potential use of hazardous materials and the potential to cause hazards related to construction and operation of the proposed project. Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. For example, lights may be on more frequently, but given the nature of the use of the fields, it is not likely it would increase use of hazardous materials. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g.,

intensity, time of day, day of week) cannot be defined at this time and therefore cannot be further analyzed.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Impact HAZ-1: Creation of a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Impact HAZ-2: Creation of a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Impact HAZ-3: Emission of hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Impact HAZ-4: Placement of project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and resulting creation of a significant hazard to the public or the environment.
- Impact HAZ-5: Placement of project-related facilities within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project area.
- Impact HAZ-6: Impairment of implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan.
- Impact HAZ-7: Exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Impacts

Impact HAZ-1: Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? (Less than Significant)

Construction

Project-related construction activities would result in a temporary increase in the transport, use, and disposal of hazardous materials and petroleum products (such as diesel fuel, lubricants, paints and solvents, and pavement, as well as fertilizer for initial installation of landscaping). Demolition, rough grading activities, and the construction of stormwater treatment areas and storm drain lines included in the project would use typical construction equipment that uses diesel fuels and lubricants. Construction-related transport, use, storage, and disposal of hazardous materials would be temporary.

The U.S. Department of Transportation regulates transport of hazardous materials and has stringent regulations to ensure safe transportation of hazardous materials under the federal hazardous materials transportation law (49 U.S.C. Parts 5101 et seq.). The EPA (C.F.R. Titles 29, 40, and 49) provides additional requirements for the regulation, manufacturing, and disposition of industrial

chemicals to reduce the potential for the release of hazardous materials during project construction and operations. The Spill Prevention, Control, and Countermeasure (SPCC) rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. As discussed in Impact 3.9-1 of Section 3.9, *Hydrology and Water Quality,* accidents and improper handling of hazardous materials during construction can release hazardous materials into the environment in the form of runoff or stormwater runoff. To minimize runoff of hazardous materials, the project would obtain coverage under the statewide NPDES General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit) (NPDES Permit, 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-006-DWQ) because construction and implementation would disturb more than 1 acre. Under the requirements of the NPDES the project would prepare a SWPPP that includes BMPs to avoid spills and releases of hazardous materials and wastes into the environment (see Impact 3.9.1 in Section 3.9 for additional details).

Demolition of existing buildings on site also has the potential to encounter asbestos and lead-based paint, which were prevalent in building materials at the time existing buildings were constructed. However, compliance with federal, state, and local regulations (including the Toxic Substances Control Act, the National Emission Standard for Hazardous Air Pollutants, and the Resource Conservation and Recovery Act) as discussed in greater detail in Impact AQ-3 in Section 3.2, *Air Quality*, would minimize exposure risks to unknown hazardous materials. Proposed project and project variant construction would use the same materials and methods, and therefore would result in similar impacts. Adherence to existing rules and regulations would result in a **less-than-significant** impact during construction.

Operation

Project operations would result in routine transportation, use, storage, or disposal of hazardous materials such as fertilizer for landscaped areas or paint and chemicals for maintenance activities. Due to the nature of the project, operations would also generate household waste. However, compliance with federal, state, and local regulations (including the Toxic Substances Control Act, the National Emission Standard for Hazardous Air Pollutants, and the Resource Conservation and Recovery Act) would minimize exposure risks during maintenance activities. Additionally, these materials would be used in much lower quantities and mostly for household uses, compared to construction activities.

For project operations, either natural grass or synthetic turf would be installed on the field. If the latter option is selected, the field may have a synthetic turf with a carpet backing and alternative infill of cork and sand. Synthetic turf can be made of components such as polyethylene, and the carpet backing may be woven polypropylene, latex, or urethanes and treated with ultraviolet (UV) inhibitors. The concerns about synthetic turf and chemical exposure, in general, have centered around the use of crumb rubber as infill (EPA 2023; OEHHA 2023). However, the proposed project would most likely use cork and sand, and crumb rubber would not be used. The cork is a natural wood product and poses no known hazards. The sand would be rounded and dust free, which would eliminate or substantially limit risk of inhalation of sand. Maintenance of the synthetic field would use a field groomer and a sweeper, which are meant to collect debris but leave infill. No chemicals would be required for maintenance. The synthetic turf itself does not pose a substantial hazard, as it tends to be made out of material like propylene, which is considered to be a nonhazardous material under OSHA standards. The proposed project and project variant would have the same residential

and recreational components, and would therefore have the same impacts. Operation impacts would be **less than significant**.

Impact HAZ-2: Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? (Less than Significant)

Construction of the proposed project and the project variant would require excavation and movement of soils. While there is no known contamination on the site following a Phase I Environmental Site Assessment (ESA) and limited Phase II ESA, there is often a potential of uncovering previously unknown hazardous conditions or potential contamination associated with prior use of the site. Compliance with federal, state, and local regulations (including the Toxic Substances Control Act, the National Emission Standard for Hazardous Air Pollutants, and the Resource Conservation and Recovery Act) would minimize exposure risks to unknown hazardous materials, and would reduce any impacts to **less than significant**.

Impact HAZ-3: Would the project cause emission of hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? (No Impact)

The closest schools to the project site are John Muir Elementary School and Parkside Middle School, which are located approximately 1 mile northwest and northeast, respectively, of the project site. Both schools are located over one-quarter mile from the project site and along roads unlikely to be used for construction traffic or be affected by any unprecedented hazardous materials emissions or leakage, in particular due to compliance with regulations related to transportation of hazardous waste. The proposed project and variant are in the same location and would have the same impact. The project and project variant would have **no impact**.

Impact HAZ-4: Would the project involve the placement of project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and resulting creation of a significant hazard to the public or the environment? (No Impact)

The project site is not on any list compiled pursuant to Section 65962.5 of the Government Code. Therefore, there would be **no impact**.

Impact HAZ-5: Would the project place facilities within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project area? (Less than Significant with Mitigation)

Noise impacts related to the ALUCP are evaluated in Section 3.11, *Noise*.

Flight hazards include tall objects as well as visual and electronic forms of interference. The project site is inside AIA B as defined by the SFO ALUCP. The critical aeronautical surfaces at the proposed project location are at an elevation of approximately 860 feet amsl (C/CAG 2012). The school site elevation is about 430 feet amsl, and the maximum height of the single-family residences would be 28 feet. Therefore, the height of residences would be below critical aeronautical surfaces. The field elevation is about 380 feet amsl, and the tallest light standard would be 80 feet, meaning that the lighting structures would also be below critical aeronautical surfaces identified in the ALUCP. A

crane may also be used to install the light standards but would be a temporary use. Therefore, the proposed project and variant would not conflict with the Airspace Compatibility Policies of the SFO ALUCP.

SFO also indicated in its scoping letter provided to the City in response to the Notice of Preparation that the recreation field lighting should be downward facing to minimize visual hazards to pilots that would be incompatible with ALUCP Policy AP-4. ALUCP Policy AP-4 A notes that "[s]ources of glare, such as . . . bright lights . . . which would interfere with the vision of pilots making approaches to the Airport" are considered incompatible. The lights associated with recreation use would be downward facing as they are meant to illuminate the field during game play. That policy also indicates that proof of consistency with that performance standard must be provided to the ALUC by the sponsor of the proposed land use action. In this case, the City would provide such proof with final lighting design.

FAA regulation 14 C.F.R. Part 77 requires notification of any construction or alteration that would result in a structure being greater than 200 feet (61 meters) above ground level from its base or that would exceed a specified height from an imaginary slope from the nearest runway. No structures proposed on the site would be greater than 200 feet. The ALUCP for SFO indicates the project site's imaginary surface in the project area is between 162.3 and 200 feet amsl. Given that the site itself ranges from 380 to 430 feet amsl, the ALUCP indicates the terrain penetrates the airspace surface. As a result, the proposed project and variant may pose airspace safety concerns. Mitigation measure HAZ-5a would apply to the residential component of the project and would require either a finding of no-hazard from the FAA or documentation that site conditions are such that notification is not required because there would be no safety hazard due to existing shielding. For the recreational component, Mitigation measure HAZ-5b requires obtaining a finding of no-hazard from the FAA due to the height of light standards and the addition of new lighting. These components would be the same under the proposed project and the project variant. As a result, this impact would be **less than significant with mitigation**.

Mitigation Measure HAZ-5a: FAA Part 77 Determination or Documentation of Exception for Residential Component

The project sponsor for the residential component of the proposed project shall obtain a determination of no-hazard from the FAA when notification under 14 C.F.R. Part 77 is required for any component of the residential portion of the proposed project. The project sponsor shall provide documentation of the FAA finding to the City prior to the use of equipment or installation of structures that require notification under 14 C.F.R. Part 77. Alternatively, the project sponsor can provide documentation that notification is not required under 14 C.F.R. Part 77.9(e) should it be found that new structures "will be shielded by existing structures of a permanent and substantial nature or by natural terrain or topographic features of equal or greater height and will be located in the congested area of a city, town, or settlement where the shielded structure will not adversely affect safety in air navigation." Such documentation shall be provided to the City prior to the start of construction of the residential component of the proposed project.

Mitigation Measure HAZ-5b: FAA Part 77 Determination for Recreation Component

The City shall obtain a determination of no-hazard from the FAA when notification under 14 C.F.R. Part 77 is required for any component of the recreation portion of the proposed project,

such as the light standards. The City shall obtain documentation of the FAA finding prior to the use of equipment or installation of structures that require notification under 14 C.F.R. 77.

Impact HAZ-6: Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? (Less than Significant)

Construction

A short-term increase in traffic would occur due to construction-related activities but would not result in a substantial increase in traffic that would interfere with an adopted emergency response plan or emergency evacuation plan.

Project construction would require the temporary road closure of Courtland Drive during reconfiguration of the road. However, access would still be maintained to the project site for emergencies because it would be accessible for construction activities, and there are alternative routes through nearby neighborhood that would provide the same access in the area in the case of evacuation and emergencies. For example, access from north of the project area to south of the project area would still be available via Madison Avenue. In addition, the project site currently has no residents. There could be recreational visitors if homes are constructed when the residential fields are still available for use. However, there would also be no recreational users when the recreational field is under construction, which would be up to 21 months. If recreational users have access to the field during construction and there is a wildfire, they would also be able to exit the field area in the same way they entered the site. Construction conditions of the proposed project and project variant would be the same, so that impacts would also be the same. There would be **no impact** related to evacuation or emergency response during construction.

Operation

Vehicular circulation would be provided to the project from Piedmont Avenue at its southern entrance and Courtland Drive at its northern entrance. Courtland Drive would be a public road with a public right-of-way, similar to current conditions. The project would not include any changes to existing public roadways that provide emergency access to the site or surrounding area. Existing easements provide access to the church and would continue to do so. Additionally, an existing easement that provides the California Department of Transportation (Caltrans) with access to adjacent Interstate 280 property would be replaced to reflect the new alignment of Courtland Drive.

Development of homes would increase traffic in the area, although the use of the sports fields is expected to have the same maximum number of attendees per game so that traffic associated with the sports fields at any given time should be similar to baseline conditions. The project's design includes a ring road that provides circulation within the outer portions of the residential component of the project site, with east/west drives throughout; this road would provide interior access and evacuation routes. Two common area parcels located along the western portion of the developed site would provide access for the fire department and homeowner's association maintenance contractors to the natural open space parcel and for ongoing maintenance and site safety. In addition, the project would be designed to comply with requirements for emergency vehicle access. The variant would have the same design aspects as described for the proposed project and would therefore have the same impacts. The impact would be **less than significant**.

Impact HAZ-7: Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? (Less than Significant)

The proposed project would have **less-than-significant** impacts related to wildfire. Please refer to Section 3.18 for detailed analysis related to wildfire.

3.9 Hydrology and Water Quality

This section evaluates the project's potential environmental impacts on hydrology and water quality. It first describes the existing hydrologic and water resources in the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.9.1 Existing Conditions

Regulatory Setting

Federal

Clean Water Act

The federal Clean Water Act (CWA) was enacted with the primary purpose of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The CWA directs states to establish water quality standards for all "waters of the United States" and to review and update such standards on a triennial basis.

The U.S. Environmental Protection Agency (EPA) has delegated responsibility for implementation of portions of the CWA, including water quality control planning and control programs, such as the National Pollutant Discharge Elimination System (NPDES) program (discussed below), to the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards). The State Water Board establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and state water quality statutes and regulations. The Regional Water Boards develop and implement water quality control plans (basin plans) that identify the beneficial uses of surface and ground waters, water quality characteristics, and water quality problems.

NPDES General Permit for Construction Activities

Most construction activities that disturb 1 acre of land or more are required to obtain coverage under the NPDES General Permit for Construction Activities (Construction General Permit). The State Water Board has issued a statewide Construction General Permit (Order No. 2009-0009-DWQ, NPDES No. CAR000002, as amended by 2010-0014-DWQ and 2012-0006-DWQ), adopted September 2, 2009. Construction activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation, that result in soil disturbances of at least 1 acre of total land area. The Construction General Permit requires the applicant to file a notice of intent (NOI) to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP). The SWPPP includes a site map and a description of proposed construction activities, along with a demonstration of compliance with relevant local ordinances and regulations, and an overview of the best management practices (BMPs) that would be implemented to prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources. Permittees are further required to conduct annual

monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants.

NPDES General Municipal Stormwater Permit

CWA Section 402 mandates permits for municipal stormwater discharges, which are regulated under the NPDES General Permit for Municipal Separate Storm Sewer Systems (MS4) (MS4 Permit). MS4 Permits require that cities and counties develop and implement programs and measures to reduce the discharge of pollutants in stormwater discharges to the maximum extent possible, including management practices, control techniques, system design and engineering methods, and other measures as appropriate. As part of permit compliance, these permit holders have created stormwater management plans for their respective locations. These plans outline the requirements for municipal operations, industrial and commercial businesses, construction sites, and planning and land development. These requirements may include multiple measures to control pollutants in stormwater discharge. During implementation of specific projects under the program, project applicants will be required to follow the guidance contained in the stormwater management plans as defined by the permit holder in that location. The discharge of stormwater runoff from the MS4 in San Mateo County is permitted under the San Francisco Bay Municipal Regional Stormwater Permit (MRP) (Order No. R2-2022-0018; NPDES Permit No. CAS612008), which is discussed further below.

State

Porter-Cologne Water Quality Control Act and Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is established and implemented by the State Water Board and nine Regional Water Boards. Waters of the State are defined more broadly than "waters of the United States;" they are defined as any surface water or groundwater, including saline waters, within the boundaries of the state. This includes waters in both natural and artificial channels. The act requires projects that are discharging, or proposing to discharge, wastes that could affect the quality of the state's water to file a waste discharge report with the appropriate Regional Water Board. The Porter-Cologne Act also requires that the State Water Board or a Regional Water Board adopt basin plans for the protection of water quality. The San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) specifies regionwide and water body–specific beneficial uses, and sets numeric and narrative water quality objectives for several substances and parameters in numerous surface waters in its region (San Francisco Bay Regional Water Quality Control Board 2023). The project lies within the jurisdiction of the San Francisco Bay Regional Water Board. The Basin Plan was last updated in 2023 (San Francisco Bay Regional Water Quality Control Board 2023).

Local

San Francisco Bay Municipal Regional Stormwater Permit

The City of San Bruno is a Permittee under the MS4 Phase I San Francisco Bay MRP (Order No. R2-2022-0018 NPDES Permit No. CAS612008) for the discharge of stormwater runoff from the MS4s. As appropriate, all projects must implement construction-phase BMPs, postconstruction site design measures to maximize infiltration in pervious areas, and postconstruction source control measures to help keep pollutants out of stormwater. Postconstruction stormwater treatment measures are required for most projects with 5,000 square feet or more of impervious surface. Postconstruction

stormwater quantity (flow-peak, volume, and duration) controls are required for projects in certain locations with 1 acre or more of impervious surface, in accordance with local Hydromodification Management Plans (HMPs).

Provision C.3 of the San Francisco Bay MRP requires new development and redevelopment source control, site design, and stormwater treatment measures to address pollutant discharges in stormwater runoff. This goal is accomplished through low-impact development (LID) techniques, including infiltration and biotreatment. The current MRP regulates stormwater treatment for new development. The project is a new development project, and therefore would be considered a Regulated Project under the San Francisco Bay MRP.

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) is a partnership of the City/County Association of Governments (C/CAG), each incorporated city and town in the county, and the County of San Mateo, which share a common NPDES permit. The project would be required to comply with the San Francisco Bay MRP Provision C.3 Stormwater Technical Guidance. Municipalities apply the Maximum Extent Practicable standard,[1] including standard stormwater conditions of approval for projects that receive development permits. The SMCWPPP prepared a C.3 Stormwater Technical Guidance dated October 2014 to assist projects in designing appropriate postconstruction stormwater controls to meet local jurisdictional requirements and the requirements of the San Francisco Bay MRP. The C.3 and C.6 Development Review Checklist is required for all projects requiring a planning or building permit that would result in any new areas of impervious surface. SMCWPPP Provision C.3.g (Hydromodification Control Requirements) requires that certain new development projects manage increases in stormwater runoff flow and volume. Permittees, including the City of San Bruno, have developed maps showing where HM controls are required. The project is subject to SMCWPPP Permit Provision C.3.g because the site is within the limits of hydromodification areas as shown in the Hydromodification Applicability Maps attached to Order No. R2-2022-0018.

City of San Bruno General Plan

The City of San Bruno's current general plan, adopted in 2009, includes goals and policies associated with hydrology and water quality (City of San Bruno 2009). The *San Bruno General Plan* has identified policies from the Environmental Resources and Conservation, and Health and Safety elements, related to hydrology and water quality.

- **ERC-20.** Require implementation of Best Management Practices to reduce accumulation of non-point source pollutants in the drainage system originating from streets, parking lots, residential areas, businesses, and industrial operations.
- **ERC-23.** Regulate new development to minimize stormwater runoff rates and volumes generated by impervious surfaces, and maximize recharge of local groundwater aquifers when feasible. Utilize the recommendations provided in the Bay Area Stormwater Management Agency's Start at the Source Design Guidance Manual for Stormwater Quality Protection
- **ERC-24.** Require that new development incorporate features into site drainage plans that reduce impermeable surface area and surface runoff volumes. Such features may include:

[1] The federal CWA requires that NPDES permits for MS4 must require municipalities to reduce pollutants in their stormwater discharges to the maximum extent practicable. MS4 permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods" (State Water Resource Control Board 2004).

  - Additional landscaped areas including canopy trees and shrubs;
  - Reducing building footprint;
  - Removing curbs and gutters from streets and parking areas where appropriate to allow stormwater sheet flow into vegetated areas;
  - Permeable paving and parking area design;
  - Stormwater detention basins to facilitate infiltration; and
  - Building integrated or subsurface water retention facilities to capture rainwater for use in landscape irrigation and other non-potable uses.

- **HS-17.** Require upgrade of the City's storm drain infrastructure proportionate with new development's fair share of demand. Require that stormwater management capacity and infrastructure are in place prior to occupancy of new development.
- **HS-18.** Require developers to implement erosion and sedimentation control measures to maintain an operational drainage system, preserve drainage capacity, and protect water quality.
- **HS-20.** Retain existing open space areas that serve as detention ponds in order to retain stormwater, recharge aquifers, and prevent flooding.
- **HS-22.** Require that construction-related grading and other activities comply with the Association of Bay Area Governments' (ABAG) Manual of Standards for Erosion and Sediment Control Measures and with the California Stormwater Quality Association (CASQA), Stormwater Best Management Practice Handbook for Construction.

San Mateo County Flood & Sea Level Rise Resiliency District (OneShoreline)

The San Mateo County Flood & Sea Level Rise Resiliency District, also known as OneShoreline, is a Countywide Special District formed to address sea level rise, flooding, coastal erosion, and regional stormwater infrastructure. There are currently three active flood control zones: Colma Creek, San Bruno Creek, and San Francisquito Creek. The project area is in the San Bruno Creek flood zone. The zone is not an area subject to flooding but is instead a geographic zone created to finance channel and culvert improvements in the lower reach of San Bruno Creek and that also finances the maintenance of channels and contracts with the City of San Bruno for pump station maintenance (County of San Mateo 2023).

OneShoreline has issued for public review a planning guidance policy (OneShoreline 2023), which is voluntary guidance for consideration of climate-driven flooding, stormwater, groundwater rise, and sea level rise in long-term planning efforts and approval of projects in areas near the San Francisco Bay that may be affected by future climate change impacts. Chapter IV of the guidance has a project review checklist and a list of standard conditions of approval. The questions and conditions largely pertain to projects within 100 feet of the San Francisco Bay or waterways, though some are relevant to the proposed project.

Environmental Setting

Hydrology and Drainage

Groundwater

Some of the City's water supply is obtained from groundwater pumping, ranging from about 9.2 percent to 18.1 percent of total supply according to Table 6-3 of the City's Urban Water Management Plan. As of the last Urban Water Management Plan, the intent of San Bruno was to use groundwater wells to meet as much of the City's future demands as possible without negatively impacting groundwater quality or sustainability of the aquifer. The quantity of groundwater available to the City would depend on multiple factors, including groundwater quality, potential effects on sea water intrusion, and the implementation of the regional groundwater storage and recovery project. Groundwater continues to remain a reliable source of water supply to the City. The groundwater management plan indicates that the South Westside Basin is not in overdraft, and that the City can sustain a groundwater production rate of 2.1 million gallons per day on a long-term basis. The groundwater management plan has triggers and mitigation measures if overdraft is detected in the basin. While not anticipated, groundwater production could be limited if local monitoring wells detect overdraft is occurring in the vicinity of the City's wells (City of San Bruno 2021).

The project site is not located within a mapped groundwater basin (DWR 2023). The closest groundwater basin is the Westside Groundwater Basin, the western edge of which is mapped about 0.25 mile east of the project site. However, this basin is considered "very low priority" and therefore does not need to comply with the Sustainable Groundwater Management Act (County of San Mateo Office of Sustainability 2023). Thus, the basin has no Groundwater Sustainability Plan.

Surface Water Hydrology

There are no waterways on site; however, there are existing drainage patterns on site for surface water runoff. The existing project site can be divided into four drainage areas, as shown in Figure 3.9-1 (Hansen 2023).

- **Area 1.** School, playing fields, landscape and private roadways: stormwater is collected through a private storm drain system and conveyed to the northwest corner of the property where it goes into a field inlet and is discharged into an existing system along Keefe Court (the storm drain on Keefe Court is a public storm drain, while the storm drain between the project site and Keefe Court is not owned or maintained by the City).
- **Area 2.** Hillside landscape on the eastern side of Courtland Drive: sheet flows east down the hillside toward Interstate 280.
- **Area 3.** Western vegetated hillside: sheet flows toward the Crestmoor Park subdivision, where surface stormwater is collected in concrete ditches and conveyed to the public storm drain system along Madison Avenue.
- **Area 4.** Northeast corner of the property with a partial existing driveway, landscape, and a portion of Courtland Drive: sheet flows to Courtland Drive and flows north outside the property to a storm drain system on Courtland Drive.

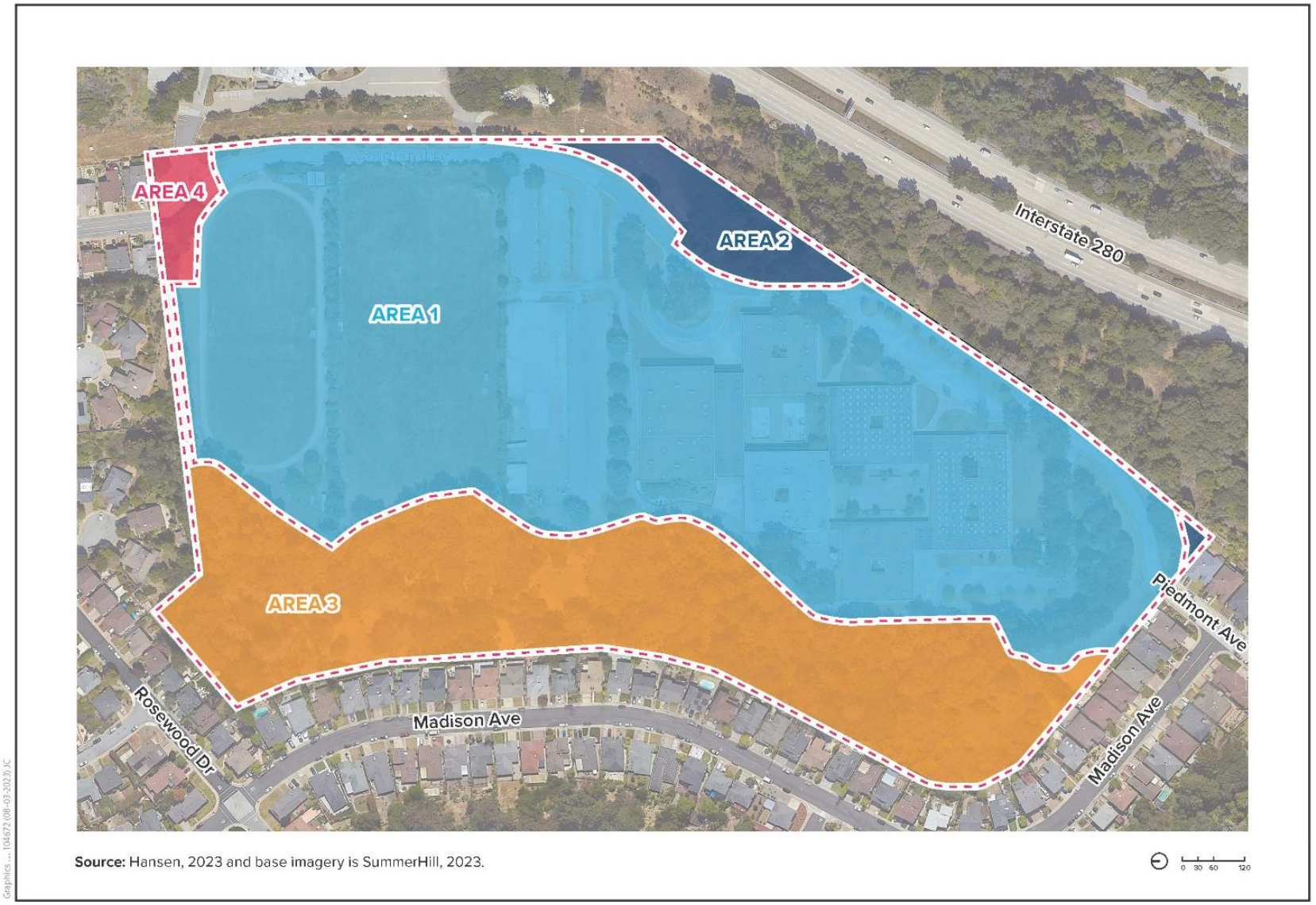


Figure 3.9-1. Existing Site Drainage Conditions

Flood Hazards

The project site is not mapped as a flood area (FEMA 2019). Additionally, given the topographic prominence of the site, it is not at risk of tsunami or seiche.

Water Quality

Water quality in a typical surface water body is influenced by processes and activities that take place within the watershed. There are no surface water bodies in the project area; however, stormwater drainage from the site can eventually enter the stormwater system or surface water bodies. The quality of the stormwater runoff from the project site and surrounding development is typical of urban watersheds where water quality is affected primarily by discharges from both point and nonpoint sources. Point-source discharges are discharges that one can point to as known sources of pollutants, while nonpoint source discharges generally result from diffuse sources, such as land runoff, precipitation, or seepage. Point and nonpoint sources include outfalls, winter storms, overland flow, exposed soil, roofs, parking lots, and streets. Water quality in the vicinity of the project site is directly affected by stormwater runoff from adjacent streets and properties that deliver fertilizers, pesticides, automobile and traffic pollutants (e.g., oil, grease, metals), and sediment with associated pollutants from soil erosion, trash, and other pollutants. There is currently no stormwater treatment for roadways on site.

3.9.2 Environmental Impacts

Methods for Analysis

Analysis of potential impacts on hydrology and water quality relies on existing documents and studies addressing water resources in the area as well as project-specific hydrologic studies. The determination of the significance of impacts assumes compliance with relevant federal, state, and local laws, ordinances, and regulations. Information reviewed includes the *Preliminary Hydrology Analysis* dated February 1, 2023 (Hansen 2023) and the *Stormwater Design Intent Memorandum* dated August 19, 2022 (Hansen 2022).

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. Additional use of the field would have no additional impacts related to hydrology and water quality because those resources are not affected differently by intensity of use of the recreational fields. Increased use would not change the size, location, or design of facilities, and therefore would not involve ground disturbance or other activities could potentially impact water quality and hydrology. Therefore, the potential for increased use, in addition to being currently undefinable, is not analyzed further.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the following conditions.

- Impact WQ-1: Violation of any water quality standards or waste discharge requirements or other substantial degradation of surface or groundwater quality.

- Impact WQ-2: Substantial decrease of groundwater supplies or substantial interference with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- Impact WQ-3: Substantial alteration of the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: (1) result in substantial erosion or siltation on- or offsite; (2) substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or offsite; (3) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or (4) impede or redirect flood flows?
- Impact WQ-4: In flood hazard, tsunami, or seiche zones, risk release of pollutants as a result of project inundation.
- Impact WQ-5: Conflict with or obstruction of implementation of a water quality control plan or sustainable groundwater management plan.

Impacts

Impact WQ-1: Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality? (Less than Significant)

Construction

Construction activities associated with both the residential component and recreation area would temporarily expose soils. Vegetation management activities in the wooded area west of the residential development could also mobilize soils. Demolition of softscape and hardscape, grading, and drainage improvements would increase the potential for sedimentation of stormwater runoff. This could transport sediment into the stormwater system or into local waterways. Sediments entering surface water are classified as a nonpoint source pollutant, which can be deposited in stormwater and surrounding waterways, ultimately degrading water quality and wildlife habitats. Construction activities would also use typical construction equipment with fuels and lubricants. Accidents or improper handling or use of these materials could release them into the environment where they could similarly degrade water quality.

As discussed in Impact HAZ-1, in Section 3.8, *Hazards and Hazardous Materials,* compliance with existing safety regulations would reduce the potential for hazardous materials releases, which would also reduce the potential for water quality impacts. Additionally, construction activities at both the recreation facility and in the residential area would disturb more than 1 acre of soil, so that both would require coverage under the statewide NPDES General Permit for Discharge of Stormwater Associated with Construction Activity (Construction General Permit). Coverage under the Construction General Permit requires preparation and implementation of an SWPPP. The SWPPP would be required to identify temporary BMPs to prevent the transport of earthen materials from construction sites during periods of precipitation or runoff, and temporary BMPs would be required to prevent wind erosion of earthen materials. Mandatory compliance with adopted regulations would require the project to minimize erosion and loss of topsoil during construction. The applicant for the residential component has already indicated in their C.3 and C.6 Development

Review Checklist[2] provided to the City that they intend to implement a variety of construction BMPs, including the following.

- Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
- Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
- Do not clean, fuel, or maintain vehicles on site, except in a designated area where wash water is contained and treated.
- Use temporary erosion controls to stabilize all denuded areas until permanent erosion controls are established.
- Perform clearing and earth-moving activities only during dry weather.

Operation

Once homes are constructed and landscape is installed, the possibility of erosion would be reduced. In addition, once the synthetic turf or natural grass is installed on the proposed field, all exposed soil materials in that area would be covered or held in place by grass and there would be limited potential for soil erosion to occur. Additionally, the project design would follow recommendations outlined in the project-specific geotechnical report (Rockridge Geotechnical 2023). This would include protecting fill slopes against erosion by hydroseeding or hydromulching with deeply rooted, fast-growing vegetation after construction is complete. If that vegetation would not establish prior to rains, the recommendation is to protect slopes using measures like hay bales and silt fences (Rockridge Geotechnical 2023). Operations and maintenance would not require additional soil disturbance other than for small-scale landscape and vegetation maintenance activities and would not result in substantial erosion or sedimentation.

New impervious surfaces as well as the ongoing presence of homes, cars, and household activities that involve use of household hazardous materials could result in runoff into storm drains that contains sediment or hazardous materials. As part of the project, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court.

Under the project variant, the primary stormwater treatment basin would instead be located in a triangular-shaped 0.75-acre parcel owned and maintained by the Homeowners Association (HOA). The new private storm drain line would continue to connect to the existing private storm drain line off Keefe Court.

Conclusion

Impacts of the project variant would be similar to those of the proposed project given the similarity in disturbed areas and project components. With compliance with existing safety-related

[2] This checklist is for MRP Stormwater Controls for Development Projects submitted to the County of San Mateo for compliance with the SMCWPPP.

regulations, implementation of BMPs per a SWPPP, and treatment of stormwater in a bioretention basin, impacts would be **less than significant**.

Impact WQ-2: Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? (Less than Significant)

The proposed project is not located within a groundwater basin boundary and therefore would have no effect on groundwater recharge. Given that some of the City's water supply is derived from groundwater, water use on the site would also include groundwater use. However, as described above, the most recent Urban Water Management Plan (City of San Bruno 2021) states that the South Westside Basin is not in overdraft, and that the City can sustain a groundwater production rate of 2.1 million gallons per day on a long-term basis. Additionally, the groundwater management plan has triggers and mitigation measures if overdraft is detected in the basin. While not anticipated, groundwater production could be limited if local monitoring wells detect overdraft is occurring in the vicinity of the City's wells (City of San Bruno 2021). The analysis in Impact UT-2 also demonstrates sufficient water supplies would be available. Therefore, the project would not result in a substantial decrease of groundwater supplies or a substantial interference with groundwater recharge. Impacts under the variant would be the same as the proposed project because water use would be the same. Impacts would be **less than significant**.

Impact WQ-3: Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would: (1) result in substantial erosion or siltation on- or offsite; (2) substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or offsite; (3) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or (4) impede or redirect flood flows? (Less than Significant)

The project site is not located in a flood area and therefore would not redirect flood flows. Existing drainage patterns would remain substantially the same after implementation of the proposed project, including residential, vegetation management, and recreation components. However, some of Area 2 and Area 3 and all of Area 4 would be directed into the Area 1 storm drain systems, as shown in Figure 3.9-2. The preliminary findings regarding stormwater drainage found that there would be an increase in stormwater runoff by about 2.26 cubic feet per second in Area 1 (Hansen 2023). As part of the project, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. The stormwater treatment basins and onsite detention would be sized to contain the runoff so that it would be at a minimum at existing conditions or below them for a 25-year storm. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court.



Figure 3.9-2. Future Site Drainage Conditions

The proposed project would reduce the runoff flows in Area 2 and Area 3 (Hansen 2023). While the street storm drain system would need to be designed to withstand a 25-year storm, the applicant would need to show that the project would be designed to contain the 100-year storm within the right-of-way per San Bruno Municipal Code section 12.44.090(B), (F), subject to staff review. As a result, the drainage in the residential area would not be altered substantially, and it would not result in flooding, exceedance of the stormwater drainage system capacity, or substantial erosion or siltation.

The new recreational field would be constructed in an area that currently has grass turf. If natural grass is used, existing conditions would be maintained. If synthetic turf is used, most of the area would contain pervious synthetic turf, and it is likely some paved areas would surround the field. This configuration would still allow for some infiltration but may slightly increase surface water runoff. Project design has not progressed to a level that contains drainage plans. However, it is typical for drainage design to contain measures such as catch basins to connect to existing stormwater drainage infrastructure. The catch basins would facilitate infiltration and pretreat runoff to meet the requirements of the San Bruno Municipal Code. As a result, the drainage in the recreational area would not be altered substantially, and it would not result in flooding, exceedance of the stormwater drainage system capacity, or substantial erosion or siltation. Under the project variant, the primary stormwater treatment basin would instead be located in a triangular-shaped 0.72-acre parcel owned and maintained by the HOA, but subject to the same design goals and standards. The new private storm drain line would continue to connect to the existing private storm drain line off Keefe Court. Impacts under the proposed project and project variant would be similar because the design goals for runoff are the same. Impacts would be **less than significant**.

Impact WQ-4: Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? (Less than Significant)

The nearest groundwater basin has no Groundwater Sustainability Plan under the Sustainable Groundwater Management Act; therefore, there would be no conflict with a groundwater sustainability plan. As discussed under Impact WQ-1, the project and project variant would include BMPs during construction and stormwater treatment during operation that would address pollutants and prevent them from entering local waterways. Therefore, this impact would be **less than significant**.

Impact WQ-5: Would the project be in a flood hazard, tsunami, or seiche zone, and risk the release of pollutants as a result of project inundation? (No Impact)

The project site is not within a flood hazard, tsunami, or seiche zone. There would be **no impact**.

Impact WQ-6: Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? (No Impact)

There is no applicable sustainable groundwater management plan. Compliance with water quality regulations is discussed in Impact WQ-1. There would be no impact related to sustainable groundwater management plans.

3.10 Land Use and Planning

This section evaluates the project's potential environmental impacts on land use and planning. It first describes the existing land use aspects of the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

This section addresses the project's consistency with applicable land use goals, policies, and programs of the City of San Bruno, including the *San Bruno General Plan* and the Zoning Ordinance, the *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport* (City/County Association of Governments of San Mateo County 2012), and *Plan Bay Area 2050* (MTC and ABAG 2021).

3.10.1 Existing Conditions

Regulatory Setting

State

State Planning Law

California Government Code Section 65300 et seq. requires each California municipality to prepare a general plan. A general plan is defined as "a comprehensive, long-term general plan for the physical development of the county or city, and any land outside its boundaries which in the planning agency's judgment bears relation to its planning." State requirements call for general plans that "comprise an integrated, internally consistent and compatible statement of policies for the adopting agency." While allowing considerable flexibility, state planning laws do establish some requirements for the issues that general plans must address. The California Government Code establishes both the required content of general plans and rules for their adoption and subsequent amendment.

Regional

Plan Bay Area 2050

Senate Bill (SB) 375, also known as the Sustainable Communities and Climate Protection Act of 2008, requires the integration of land use, housing, and transportation planning to achieve regional greenhouse gas (GHG) emissions reductions, adopted by the California Air Resources Board. SB 375 requires Metropolitan Planning Organizations to develop a Sustainable Communities Strategy (SCS)—a new element of the Regional Transportation Plan (RTP)—to plan for achieving these GHG reduction targets. The SCS must demonstrate the attainment of the regional GHG emissions-reduction targets while accommodating the full projected population of the region.

The Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC) adopted Plan Bay Area 2050 in 2021. One of the main goals of Plan Bay Area 2050 is to reduce GHG emissions from cars and light-duty trucks through the year 2050 to meet state goals under SB 375. Plan Bay Area 2050 is the integrated land use/transportation plan and

demographic/economic forecast for the nine-county San Francisco Bay Area region. The plan coordinates housing plans, open space conservation efforts, economic development strategies, and transportation investments.

Plan Bay Area 2050 functions as both the SCS and the RTP for the region. To reduce GHG emissions, Plan Bay Area 2050 promotes compact, mixed-use, infill development within walkable/bikeable neighborhoods close to public transit, jobs, schools, shopping, parks, recreation, and other amenities. Local jurisdictions voluntarily identified Priority Development Areas (PDAs) as appropriate locations for these types of neighborhoods. PDAs are eligible for capital infrastructure funds, planning grants, and technical assistance. The project site is not within a PDA.

Comprehensive Airport Land Use Compatibility Plan

The *Comprehensive Airport Land Use Compatibility Plan for the Environs of the San Francisco International Airport*, prepared by the City/County Association of Governments of San Mateo County, is a state-mandated land use compatibility plan that addresses the compatibility of surrounding land uses in local jurisdictions with airport operations.

The project site falls within Airport Influence Areas (AIA) A and B of San Francisco International Airport (SFO). Area A includes the entirety of San Mateo County, all of which is overflown by aircraft flying to or from SFO at least once per week at altitudes of 10,000 feet or fewer above mean sea level. Area B lies within Area A and contains areas exposed to aircraft noise above the 65 decibel (dB) Community Noise Equivalent Level (CNEL) contour or lying below critical airspace (City/County Association of Governments of San Mateo County 2012).

The Airport Land Use Compatibility Plan (ALUCP) establishes safety compatibility policies to protect public health and safety by minimizing the public's exposure to the risk associated with potential aircraft accidents in the airport vicinity. The ALUCP identifies five safety compatibility zones in the vicinity of SFO. The project site does not fall within any of the airport's safety compatibility zones and is thus not subject to land use criteria pertaining to safety compatibility.

The ALUCP also establishes airport vicinity height limitations to protect public safety, health, and welfare by ensuring that aircraft can safely fly in the airspace around an airport and to protect the operational capability of airports. As noted in the ALUCP, the height of new development must be maintained below defined obstacle clearance surfaces. As shown on Figure IV-17 in the ALUCP, the project site does not fall within any of the airport's critical aeronautical surfaces.

Noise compatibility policies described within the ALUCP are intended to minimize the exposure of residents and occupants of future noise-sensitive development to excessive noise. CNEL noise contours identify areas where noise exposure is great enough to warrant land use controls to promote noise compatibility. The ALUCP includes forecasted 2015 and 2020 CNEL noise contours. The project site does not lie within the forecasted noise contours for 2015 and 2020. Therefore, the project site is subject to less than 65 dB CNEL noise (see Figure D-3, *Forecast 2015 and 2020 Noise Exposure*, in the ALUCP).

The ALUCP includes policies and standards to protect people living in the vicinity of SFO from the effects of aircraft noise (City/County Association of Governments of San Mateo County 2012). Policy NP-2, Airport/Land Use Compatibility Criteria, establishes criteria to determine the compatibility of proposed land uses in the Airport Noise Compatibility Zones. Residential uses are compatible with noise levels below 65 dB.

Local

City of San Bruno General Plan

The San Bruno General Plan, adopted in 2009, establishes a vision and action plan for the city's long-term development. The plan outlines goals and policies to encourage balanced development that conserves and revitalizes established neighborhoods and commercial areas, while promoting mixed-use and transit-supportive developments adjacent to transit stations. The resulting land use classifications and development standards that are relevant to the project site are described below.

Goals and Policies

The General Plan contains goals and policies related to Land Use and Urban Design, Economic Development, Transportation, Open Space and Recreation, Environmental Resources and Conservation, Health and Safety, and Public Facilities and Services. Applicable land use goals and policies from these elements and chapters, including the Housing Element, are discussed under Impact LU-2 below. Table 3.10-1, presented at the end of this section, analyzes the project's consistency with applicable General Plan policies that have been adopted to avoid or mitigate an environmental impact and describes the environmental impacts of any potential inconsistencies and proposed mitigation.

Existing General Plan Land Use Classifications (as of 2023)

The Low-Density Residential land use classification accommodates single-family detached housing, religious facilities, large daycares, large senior care facilities, and similar uses. All of the project site is currently classified as Low Density Residential, which permits a residential density of 2.1 to 8.0 units per acre.

Land Use and Urban Design Element

The Land Use and Urban Design Element includes policies regarding land use classifications, focus areas and corridors, and views. Policies in the element seek to ensure that new development is sensitive to existing uses and is of the highest quality design and construction.

Open Space and Recreation Element

The Open Space and Recreation Element focuses on provision of neighborhood parks, plazas, and open spaces within walking distance of all San Bruno residents and workers. San Bruno recognizes the importance of open spaces to both residents' quality of life and the city's overall image, and seeks to provide accessible, safe, and well-maintained areas. The proposed project includes a proposed amendment to Implementing Policy OSR-8, which currently reads:

> During reuse of the former Crestmoor High School site (designated for single-family residential development), preserve the existing playing fields for recreational use per direction of the General Plan Update Committee

City of San Bruno Housing Element

All California cities and counties are required to have a Housing Element included in their general plans that establishes housing objectives, policies, and programs in response to community housing conditions and needs. San Bruno's Housing Element, adopted January 24, 2023, focuses on the 2023 to 2031 planning period, consistent with the City's Regional Housing Needs Allocation as assigned to

the City by ABAG and state law requirements. The policies within the Housing Element are an expression of the statewide housing goal of "a suitable living environment for every Californian," as well as a reflection of the unique housing needs of the San Bruno community. The City sent the adopted San Bruno Housing Element to the California Department of Housing and Community Development (HCD) on January 31, 2023. HCD provided a letter to the City on March 29, 2023, that outlines additional revisions that are needed to comply with State Housing Element Law. As of the writing of this Draft EIR, HCD has not yet issued a letter finding that the City's adopted Housing Element is in substantial compliance.

San Bruno Zoning Ordinance (2019)

The San Bruno Zoning Ordinance controls development through the establishment of zoning districts and accompanying regulations for permitted and conditional uses and standards for development, such as height, bulk, setback, and lot coverage. The current zoning district in the project site is the Single-Family Residential District (R-1), which is meant to support low-density residential uses and uses related to single-family residences, such as schools, places of worship, and childcare centers. Single-family homes and accessory structures and uses are permitted by right within the R-1 district (City of San Bruno Municipal Code Section 12.96.060). Parks and recreational facilities are allowed with the issuance of a Conditional Use Permit. The maximum lot coverage permitted by all structures is 80 percent. Minimum site area permitted is 5,000 square feet for interior lots and 6,000 square feet for corner lots. The R-1 zoning code (Section 12.96.060) specifies maximum heights depending on the slope of the lot. For lots with an average slope of less than 20 percent, such as the lots on the project site, the maximum height is 28 feet.

City Ordinance No. 1284

Ordinance No. 1284, adopted in June 1977 to implement a voter-approved ballot initiative governing new development in the entire city, sets height limits on all new buildings within San Bruno to 50 feet or three stories, unless otherwise approved by a majority of the city's voters at a regular or special election. Codified in Chapter 12.26 of the San Bruno Municipal Code, Ordinance No. 1284 also restricts the construction of multi-story parking structures and limits development that affects streets in local scenic corridors. The 50-foot or three-story height limit and restriction on building new aboveground multi-story parking structures continue to apply to the project site. No streets within scenic corridors are within or adjacent to the project site. Furthermore, Ordinance No. 1284 restricts the increase of residential densities in areas that were zoned residential in 1974. While it is clear the project site was zoned Low-Density Residential in 1974, the project would not increase residential density in the area, as it would develop single-family residences in an area surrounded by single-family residences.

Environmental Setting

Regional Setting

The project site is in the City of San Bruno between the coastal range and San Francisco Bay along the northern Peninsula. San Bruno is a 5.5-square-mile city in northern San Mateo County on the eastern side of the San Francisco Peninsula. San Bruno is approximately 12 miles south of San Francisco, immediately south of the City of South San Francisco, immediately north of the City of Millbrae, and west of SFO. The city is bounded by Highway 101 on the east and the Coast Ranges on the west. The older, eastern half of San Bruno contains a diversity of land uses and residential types,

while the western half is composed primarily of single-family subdivisions. The city is connected to major transportation corridors by Highway 101, Interstates (I-) 280 and 380, and El Camino Real.

Project Site

As shown on Figure 2-2 in Chapter 2, *Project Description*, of this environmental impact report (EIR), the project site comprises a 40.2-acre area in the southern portion of San Bruno, generally bounded by Madison Avenue to the west, Whitman Way to the north, I-280 to the east, and Piedmont Avenue to the south. The County-managed Junipero Serra Park is located southeast of the project site across from I-280. The project site is approximately 1.4 miles southwest of the San Bruno Caltrain Station and 1.5 miles southwest of the San Bruno Bay Area Rapid Transit (BART) Station. The sloped areas on the west side of the former campus have been minimally maintained and are densely wooded, dominated by Monterey pine and red gum eucalyptus trees with a dense shrub layer. Within the existing developed area, the project site rises approximately 44 feet from north to south. Topographic elevations range from approximately 410 feet above sea level to approximately 380 feet above sea level.

The project site currently contains the unoccupied former Crestmoor High School, which was constructed in 1962, as well as playing fields, parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. The project site is further described in Chapter 2, Section 2.1.2, *Project Setting*. Existing single-family subdivisions neighbor the project site to the north, west, and south across substantial grade changes, with a wooded hillside buffer.

3.10.2 Environmental Impacts

Methods for Analysis

The California Environmental Quality Act (CEQA) requires that an EIR consider whether a proposed project may conflict with any applicable land use plan, policy, or regulation that was adopted for the purpose of avoiding or mitigating an environmental impact. Conflicts of a project with land use policies do not, in and of themselves, constitute significant environmental impacts. Policy conflicts are considered environmental impacts only when the policies themselves were adopted for the purpose of avoiding or mitigating an environmental effect. Such conflicts constitute significant environmental impacts only when the resulting direct environmental impacts are significant.

This environmental determination differs from the larger policy determination of whether a proposed project is consistent with a jurisdiction's general plan. The former determination, which is intended for consideration in a CEQA document, is based on, and limited to, a review and analysis of environmental impacts. The latter determination, by comparison, is made by the decision-making body of the jurisdiction and is based on the jurisdiction's broad discretion to assess whether a proposed project would conform to the policies and objectives of its general plan as a whole. In addition, the broader general plan consistency determination takes into account all evidence in the record concerning the project characteristics, its desirability, and its economic, social, and other nonenvironmental impacts.

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. No additional impacts are expected for land use with increased field uses because none of the land use policies relate to frequency of recreational

use. Therefore, the potential for increased use, which is currently undefinable, is not analyzed further.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Impact LU-1: Physical division of an established community.
- Impact LU-2: Conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

Impacts

Impact LU-1: Would the project cause a physical division of an established community? (No Impact)

The physical division of an established community typically refers to the construction of a linear feature, such as an interstate highway or railroad tracks, or removal of a means of access, such as a local bridge, that would affect mobility within an existing community or between a community and outlying area.

Temporary land use impacts associated with construction activities would include site grading, excavation, construction staging, and building erection. These activities involve the movement of heavy construction equipment, truck traffic, grading activities, construction noise, and air emissions. These activities would occur on the project site and would not divide or similarly disrupt adjacent housing in a way that divides an established community.

The project does not involve the construction of any of the linear features discussed above and would not remove any means of access. The project would change the current land use from an unoccupied former high school to residential development and open space. Existing single-family subdivisions neighbor the project site to the north, west, and south. The recreational component of the project would occur in the same area as the current recreational area. Neither the project nor the variant would not introduce any physical barriers to the project site. There would be **no impact**.

Impact LU-2: Would the project conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? (No Impact)

Plan Bay Area

As discussed in Section 3.10.1, *Existing Conditions*, Plan Bay Area 2050 promotes compact, mixed-use, infill development within walkable/bikeable neighborhoods close to public transit, jobs, schools, shopping, parks, recreation, and other amenities in order to reduce GHG emissions and adverse health impacts; increase housing opportunities, employment opportunities, access to affordable housing, and nonautomotive mode share and the effectiveness of the transportation system; and focus development within the existing urban footprint.

The proposed single-family residences would provide a new opportunity for housing to be developed on the project site, a location close to employment centers and where no housing currently exists. As discussed in Section 3.12, *Population and Housing*, population growth

anticipated to occur as a result of the project would be within the range of anticipated city growth under ABAG's Projections 2050. Housing would be developed at a variety of price points, and 15 percent of the 155 single-family residences would be below market rate, with 8 at the low-income level and 16 at the moderate-income level. As discussed in Section 3.15, *Transportation,* the project would result in significant unavoidable impacts related to vehicle miles traveled (VMT), which indicates that the project may not further the goal of increasing nonautomotive mode share and the effectiveness of the transportation system. However, the project also would not impede reaching these goals because compact, mixed-use, infill development close to transit, jobs, schools, shopping, parks, recreation, and other amenities could still be developed on sites close to those destinations. That is, although the proposed project is not mixed use or compact as a single-family housing development, it also does not place single-family homes on sites that are close to transit and non-residential destinations. Therefore, the proposed project would not preclude development of compact and mixed-use development in locations that are well-suited to reduce VMT. The project variant has the same residential components as the proposed project and would therefore also not impede reaching the goals. Therefore, there would be **no impact** related to conflicts with Plan Bay Area 2050.

Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport

As discussed above, the ALUCP for the county outlines the types of land uses that are compatible with the operations at SFO. The determination of consistency of the project with the ALUCP considers issues such as general compatibility, safety, height, and noise. The project site is not within any of the ALUCP's established Safety Compatibility Zones; therefore, none of the safety policies and corresponding land use restrictions are applicable to the project, and they are not discussed further. The project site does not fall within any of the airport's critical aeronautical surfaces. Therefore, development at the project site is not affected by height clearances established in the ALUCP. As discussed in Section 3.10.1, the ALUCP CNEL noise contours, which designate areas where noise exposure is high enough to warrant land use controls, do not include the project site. Therefore, development at the project site is not affected by noise regulations established in the ALUCP.

Pursuant to state law (and see GP-8.1 of the Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport), when a general plan amendment and/or zoning amendment are proposed within AIA B of an adopted Comprehensive Land Use Plan, a referral must be made for a consistency determination. A consistency determination from the City/County Association of Governments Board would therefore be required for the project to be approved. The project variant has the same residential and recreation as the proposed project and would therefore also be subject to the consistency determination requirement.

Real estate disclosure notification requirements also apply in AIA B. Section 11010 of the Business and Professions Code requires people offering subdivided property for sale or lease to disclose the presence of all existing and planned airports within 2 miles of the property. If the property is within an "airport influence area" designated by the airport land use commission, the following statement must be included in the notice of intention to offer the property for sale:

> This property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (for example: noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to

> consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you.

The seller must comply with all applicable laws, such as the notification requirement. Airspace hazards could occur without proper safety precautions for tall structures, such as light standards. However, the conflict itself would not result in any environmental impact. The project would otherwise be consistent with the ALUCP's policies regarding safety, heights, noise, and notification, and there would be **no impact** with respect to consistency with the ALUCP's policies.

Note that the project would require a consistency determination from the City/County Association of Governments Board. The airspace safety for the project is addressed through Federal Aviation Administration (FAA) notification via Mitigation Measures HAZ-5a and HAZ-5b, as described in Impact HAZ-5 in Section 3.8, *Hazards and Hazardous Materials*. With this mitigation, the project would be consistent with the ALUCP, but it is important to note this mitigation is needed to address the actual airspace hazards impact rather than the inconsistency with the ALUCP, which alone does not constitute an impact under CEQA.

San Bruno General Plan

Open Space and Recreation Element

The project includes an amendment to the General Plan to ensure consistency between the project and the General Plan. The project proposes an amendment to the General Plan Open Space and Recreation Element Implementing Policy OSR-8. As currently written, OSR-8 indicates the following: "During reuse of the former Crestmoor High School site (designated for single-family residential development), preserve the existing playing fields for recreational use per direction of the General Plan Update Committee." The project proposes replacement of OSR-8 with the following text:

> A private development project for reuse of the Crestmoor site shall dedicate the following areas to the City (the Dedicated Property) at the approximate locations shown in Figure 5-2 (i) approximately 5.3 acres of unimproved property located west of Courtland Drive, intended for future use primarily for soccer and playing fields; and (ii) approximately 1.61 acres of unimproved property located east of Courtland Drive intended for future use for recreation-supportive improvements, such as public parking and other improvements. Minor deviations to these locations and acreages requested by an applicant for private development to accommodate project design shall be permitted so long as the Dedicated Property can accommodate the approximate configuration shown for soccer fields and public parking as in Figure 5-2 and the Dedicated Property totals approximately 6.91 acres.
>
> Sloped areas on the Crestmoor Site, totaling approximately 12.29 acres, in the approximate area shown on Figure 5-2 (Open Space Area), shall be preserved in an unimproved state (subject to improvements required for safety and maintenance) and made publicly accessible for open space and recreational uses as part of any private development project proposed for the Crestmoor Site.

Land Use Element

The project proposes an amendment of the General Plan Land Use diagram to designate the Dedicated Property (but not the Open Space Area) as Parks/Open Space.

The current General Plan classification for the project site is Low Density Residential, which permits a density of 2.1 to 8.0 units per acre. With this range of density, roughly 84 to 321 lots would be allowed on the approximately 40.2 acres of the project site that would contain the residential development. The project proposes the development of 155 single-family homes and is therefore consistent with density requirements in the Low Density Residential General Plan designation.

Table 3.10-1 outlines the General Plan and Housing Element goals and policies that have been identified as applicable to the project. Table 3.10-1 includes a determination of "Consistent" or "Inconsistent" for each policy. The determination of whether the project would conflict with applicable policies is based on the environmental analysis provided in the applicable resource sections of this Draft EIR. For policies found to be potentially inconsistent, the table then identifies the environmental impacts of that conflict.

As described in Table 3.10-1, the project was found to be consistent with the Land Use and Urban Design, Transportation, Health and Safety, Public Facilities and Services, and Housing Elements of the General Plan. With the recommended amendment to the Open Space and Recreation and Environmental Resources and Conservation Elements, described above, the project would be consistent with those Elements of the General Plan.

The variant, however, would not be consistent with Implementing Policy OSR-8, and there is no current proposal to amend the General Plan to be consistent with the variant. However, this inconsistency would not result in an environmental impact because it would have no physical consequences on the environment.

Transportation Element

The Transportation Element of the General Plan describes San Bruno's existing transportation network, including roadway and highway system, scenic corridors, transit systems and pedestrian and bicycle facilities. Guiding Policy T-8 contains the goal to "Maintain acceptable levels of service for vehicular movement along the city's street network. Acceptable level of service could vary based on characteristics of the area under consideration." Implementing Policy T-6 contains the goal to "Maintain LOS standards for intersections for AM and PM peak periods as shown in Figure 4-2."

As described further in Section 3.15, *Transportation*, with the passage of SB 743 (September 27, 2013) and the subsequent adoption of the revised CEQA Guidelines (December 28, 2018), level of service (LOS) can no longer be used as a criterion for identifying significant transportation impacts for most projects under CEQA effective July 1, 2020. For informational purposes, this section discusses potential conflicts with these policies. To verify compliance with these policies, the City requested that Fehr and Peers include an analysis of intersections in the vicinity of the project site, including major intersections farther from the site that may be used to access the site from I-280, Skyline Boulevard, or the eastern half of the city. As shown in the informational LOS analysis (Appendix G, *Transportation*), the addition of this project would add, at most, two additional seconds of delay to nearby intersections. This is because the total number of vehicle trips generated by this project is relatively small compared to the number of trips already using the network and even smaller relative to the vehicle capacity of the surrounding network. In the PM peak hour, the number of vehicles added to the nearest intersections on Courtland Drive is approximately 110—less than two new vehicles per minute. Beyond the primary project gateways on Courtland Drive, most nearby intersections add one or less than one new vehicle per minute in the peak hour. Therefore, there would be no conflict with these policies.

Conclusion Regarding General Plan

Based on a review and analysis of the General Plan, both the proposed project and the project variant would have **no impact** related to consistency with land use classification or with goals and policies of the General Plan as amended for the project.

City of San Bruno Zoning Ordinance

Single-family residences are considered an allowable use in the R-1 Zoning District. Parks and recreational facilities are allowed with the issuance of a Conditional Use Permit in the R-1 zone. Additionally, an amendment to San Bruno Municipal Code Section 12.44070 would be needed to allow for the cross sections contemplated along Courtland Drive. However, this amendment would be completed separately and would not be part of the project approvals. There would be **no impact** under the proposed project or the project variant with the City of San Bruno Zoning Ordinance.

City Ordinance No. 1284

The project would not increase residential density in the area, as it would include development of single-family residences in an area surrounded by single-family residences and would be consistent with the zoning of the project site. Given that the project is consistent with all of the development restrictions imposed by Ordinance No. 1284, there would be **no impact**.

Table 3.10-1. Comparison to General Plan Goals and Policies

General Plan Policy	Consistency Analysis
Land Use and Urban Design Element	
Land Use and Urban Design Element: General Policy Consistency	CONSISTENT. Policies in the Land Use and Urban Design Element of the San Bruno General Plan adopted with the purpose of avoiding or mitigating environmental impacts include policies that seek to promote revitalization within existing developed areas; ensure that new development is sensitive to existing uses and minimizes glare; and work toward solutions to regional problems of open space preservation, noise attenuation, environmental hazards, affordable housing, pollution, and growth management.
Guiding Policy LUD-E: Ensure that new development, especially in residential neighborhoods, is sensitive to existing uses, and is of the highest quality design and construction.	CONSISTENT. The project proposes development of 155 single-family residences in a neighborhood composed of single-family residences and would therefore be consistent with nearby existing uses that are also largely neighborhoods consisting of single-family residences.
Implementing Policy LUD-1: Promote development of single-family housing on former school sites owned by public school districts. Retain existing recreation facilities for resident use, whenever possible.	CONSISTENT. The project proposes development of 155 single-family residences on an unoccupied high school campus and would involve an upgrade to the existing recreation use at the north end of the project site.
Implementing Policy LUD-7: Require any subdivision or development involving construction of more than five units, regardless of the number of parcels, to undergo design review. Require provision of open spaces and pedestrian connections within multifamily projects, as well as an active street frontage along arterial roadways.	CONSISTENT. The proposed project would undergo design review. The proposed project is not multifamily or along arterial roadways and so the second part of this implementing policy does not apply.

General Plan Policy	Consistency Analysis
Transportation Element	
Transportation Element: General Policy Consistency	CONSISTENT. Policies in the Transportation Element of the San Bruno General Plan adopted with the purpose of avoiding or mitigating environmental impacts include policies that seek to provide for efficient, safe, and pleasant movement for all transportation modes including walking and cycling; improve connections to transit corridors and stations to avoid dependence on single-occupant vehicles; consider the introduction of reduced parking standards to reduce incentives for single-occupant vehicles; prohibit surface parking lots from interrupting pedestrian routes or affecting surrounding neighborhoods; prohibit the encroachment of transportation facilities on irreplaceable resources; and preserve and enhance the unique natural features that constitute San Bruno's scenic roadways. As discussed in Section 3.15, the project would result in significant unavoidable impacts related to VMT, which indicates that the project may not further the goal of increasing nonautomotive mode share and the effectiveness of the transportation system. However, the project also would not impede reaching these goals. Generally, increasing nonautomotive mode share through development projects requires construction of compact, mixed-use, infill development close to transit and key destinations, as similarly described for Plan Bay Area. This kind of development could still occur on sites close to those destinations even if the proposed project or project variant is approved. That is, although the proposed project is not mixed use or compact as a single-family housing development, it also does not place single-family homes on sites that are close to transit and non-residential destinations. Therefore, the proposed project would not preclude development of compact and mixed-use development in locations that are well-suited to increase nonautomotive ride share. The City can also increase the effectiveness of the transportation system. The project's parking standards would comply with San Bruno Municipal Code Chapter 12.100 and Parking Design Standards Resolution (effective as of March 26, 2020). The project does not propose any transportation facilities on irreplaceable resources including open spaces, recreational areas, or historic sites.
Guiding Policy T-8: Maintain acceptable levels of service for vehicular movement along the city's street network. Acceptable level of service could vary based on characteristics of the area under consideration. *Implementing Policy T-6:* Maintain LOS standards for intersections for AM and PM peak periods as shown in Figure 4-2.	CONSISTENT. As shown in the informational LOS analysis (Appendix G, *Transportation*), the addition of this project would add, at most, two additional seconds of delay to nearby intersections. This is because the total number of vehicle trips generated by this project is relatively small compared to the number of trips already using the network and even smaller relative to the vehicle capacity of the surrounding network. In the PM peak hour, the number of vehicles added to the nearest intersections on Courtland Drive is approximately 110—less than two new vehicles per minute. Beyond the primary project gateways on Courtland Drive, most nearby intersections add one or less than one new vehicle per minute in the peak hour. Therefore, there would be no conflict with these policies.

General Plan Policy	Consistency Analysis
Open Space and Recreation Element	
Open Space and Recreation Element: General Policy Consistency	CONSISTENT. Policies in the Open Space and Recreation Element of the San Bruno General Plan adopted with the purpose of avoiding or mitigating environmental impacts include policies that seek to develop and maintain parks and recreation facilities. The project includes enhancement of recreation fields on the project site.
Guiding Policy OSR-A: Develop and maintain parks and recreation facilities for a wide variety of ages, abilities, and interests. Ensure that parks are ADA accessible, safe, and well maintained.	CONSISTENT. The recreational facility included in the proposed project would allow for a variety of sports uses for a variety of ages. It would maintain this kind of use in the City's overall inventory of parks and recreation facilities. The facility would be constructed according to Americans with Disabilities Act (ADA) standards and would be maintained as part of the city parks.
Guiding Policy OSR-B: Recognize the balance between maintenance and preservation of open space uses and the potential for wildland fires and flooding.	CONSISTENT. The project includes dedication of approximately 6.91 acres of public open space to the City, which would include 5.3 acres of playing field space. The City also intends to develop various recreation, recreation supporting amenities, and/or parking on approximately 1.61 acres east of Courtland Drive. The project also includes management of vegetation adjacent to these open space uses. The variant would include dedication of approximately 12.24 acres to the City, with 4.58 acres for the playing fields and 1.19 acres for recreation supporting amenities.
Implementing Policy OSR-4: Undertake a program to add 20 acres of parkland to the City system over the next 20 years. Seize opportunities to develop and/or maintain parks and recreation facilities within existing residential neighborhoods through acquisition or preservation of former school facilities.	CONSISTENT. The project includes dedication of approximately 6.91 acres of public open space, which would include recreational uses, to the City and maintain recreational use on the site. The variant includes dedication of approximately 12.24 acres of open space (4.58 acres of which would be for playing field space, and 1.19 acres of which would be for recreational supportive uses). The project site is currently an unoccupied high school campus and is surrounded by single-family residences.
Implementing Policy OSR-5: Strive to locate neighborhood park facilities within 1/3-mile walking distance of all residences in San Bruno. If limited in some neighborhoods, coordinate with local school districts to allow use of playgrounds and sports facilities after school hours.	CONSISTENT. The proposed public open space and recreational facilities would be located within walking distance to proposed and existing residences. While some residences would be practically adjacent to the recreational facilities, the farthest would be within 0.25 mile. Some existing residences would also remain in walking distance to the recreational facilities. Additionally, the proposed residential neighborhoods would contain private recreational areas.

General Plan Policy	Consistency Analysis
Implementing Policy OSR-8: During reuse of the former Crestmoor High School site (designated for single-family residential development), preserve the existing playing fields for recreational use per direction of the General Plan Update Committee.	CONSISTENT AFTER PROPOSED AMENDMENT (PROPOSED PROJECT). The project proposes amendment of Policy OSR-8 to replace the current policy with the following text: "A private development project for reuse of the Crestmoor site shall dedicate the following areas to the City (the Dedicated Property) at the approximate locations shown in Figure 5-2 (i) approximately 5.3 acres of unimproved property located west of Courtland Drive, intended for future use primarily for soccer and playing fields; and (ii) approximately 1.61 acres of unimproved property located east of Courtland Drive intended for future use for recreation-supportive improvements, such as public parking and other improvements. Minor deviations to these locations and acreages requested by an applicant for private development to accommodate project design shall be permitted so long as the Dedicated Property can accommodate the approximate configuration shown for soccer fields and public parking as in Figure 5-2 and the Dedicated Property totals approximately 6.91 acres. Sloped areas on the Crestmoor Site, totaling approximately 12.29 acres, in the approximate area shown on Figure 5-2 (Open Space Area), shall be preserved in an unimproved state (subject to improvements required for safety and maintenance) and made publicly accessible for open space and recreational uses as part of any private development project proposed for the Crestmoor Site." INCONSISTENT (VARIANT) While the proposed project would include dedication of approximately 6.91 acres of public open space to the City and retain approximately 12.29 acres of privately owned, publicly accessible open space, the variant would include dedication of approximately 12.24 acres of land to the City for public open space and retain approximately 7.51 acres of privately owned open space. The playing fields and other recreational uses would be the same as with the proposed project, except that the graded area within the dedicated open space that could be improved by the City and used by these facilities would be about 1.14 acres smaller than with the proposed project. Similar to the proposed project, without to an amendment of the General Plan, the variant would not be consistent with Implementing Policy OSR-8. However, the inconsistency would not result in an environmental impact because it would not have any physical consequences to the environment.

General Plan Policy	Consistency Analysis
Implementing Policy OSR-21: Pursue solutions to eliminate the drainage and erosion issues that present a danger to public health and safety in existing park sites.	CONSISTENT. The new recreational field would be constructed in an area that currently has grass turf and is likely not subject to substantial erosion due to the presence of vegetation. With the proposed project, if artificial turf is used, most of the area would contain pervious artificial turf, and it is likely some paved areas would surround the field. This configuration would still allow for some infiltration but may slightly increase surface water runoff and could therefore increase erosion. The use of natural grass would maintain drainage patterns. Project design has not progressed to a level that contains drainage plans. However, it is typical for drainage design to contain measures such as catch basins to connect to existing stormwater drainage infrastructure. The catch basins would facilitate infiltration and pretreat runoff to meet the requirements of the San Bruno Municipal Code.
Implementing Policy OSR-38: Require open space easements or deed restrictions on undevelopable property. Through the plan review process, require recordation of open space easement, deed restriction, dedication or other legal means of permanently restricting development of open space lands.	CONSISTENT. The sloped area west of the residential and recreational use would be considered open space and would not be developed but would be instead subject to ongoing vegetation maintenance activities.
Environmental Resources and Conservation Element	
Environmental Resources and Conservation Element: General Policy Consistency	GENERALLY CONSISTENT. Policies in the Open Space and Recreation Element of the San Bruno General Plan adopted with the purpose of avoiding or mitigating environmental impacts include policies that seek to protect the natural environment from destruction during new construction or redevelopment within San Bruno, reduce pollution levels within surface water, improve ambient air quality levels, and preserve and enhance historic and cultural resources. As shown in the resource sections of Chapter 3, *Environmental Impact Analysis*, the project would not result in significant environmental impacts on agriculture and forestry resources, geology/soils, hazards and hazardous materials, mineral resources, or wildfire. Impacts would be less than significant for air quality, biological resources, cultural resources, and tribal cultural resources.
Guiding Policy ERC-A: Preserve open space essential for the conservation of San Bruno's natural resources—including vegetation, wildlife, soils, water, and air.	CONSISTENT. The proposed project includes preservation of open space areas, and construction of buildings would generally occur within the already-developed footprint of the former Crestmoor High School and existing recreation fields.

General Plan Policy	Consistency Analysis
Guiding Policy ERC-B: Protect the natural environment, including wildlife, from destruction during new construction or redevelopment within San Bruno.	INCONSISTENT (CONSISTENT WITH MITIGATION). The proposed project includes preservation of open space areas, and construction of buildings would generally occur within the already-developed footprint of the former Crestmoor High School and existing recreation fields. Vegetation management activities in the wooded slope area would still provide habitat for species. As discussed in Section 3.3, *Biological Resources*, there would be some significant impacts on wildlife, including San Francisco dusky-footed woodrat, nesting birds, and bats, in particular during construction, but also during ongoing vegetation management activities. Heritage trees would also potentially be damaged. As a result, the project as proposed would not be consistent with this policy. However, no impacts would emanate from this inconsistency. Note that these underlying impacts are addressed by Mitigation Measures BIO-1a, BIO-1b, BIO 1c, and BIO-4, but it is important to note this mitigation is needed to address the actual biological resources impacts rather than the inconsistency with Guiding Policy ERC-B, which alone does not constitute an impact under CEQA. However, with these mitigation measures, the proposed project would be consistent with Guiding Policy ERC-B.
Implementing Policy ERC-2: Preserve as open space those portions of property which have significant value to the public as scenic resources, aesthetic, or recreation purposes.	CONSISTENT. No onsite resources have been identified as having significant value to the public as scenic resources or aesthetic purposes. It is known that the fields on the site have substantial value to the community for their recreational purposes. The proposed City portion of the project would implement upgrades to the northern-most field.
Implementing Policy ERC-3: 3 Protect natural vegetation in park, open space, and scenic areas as wildlife habitat, to prevent erosion, and to serve as noise and scenic buffers	CONSISTENT. The natural vegetation in the wooded open space area would be retained but managed for wildfire risk but could still serve as wildlife habitat and provide other ecosystem functions.
Implementing Policy ERC-9: Preserve mature trees and vegetation, including wildflowers, within open canyon areas and along the city's scenic roadways.	CONSISTENT. The project site is not in an open canyon area or along any of the City's scenic roadways.
Implementing Policy ERC-10: Require incorporation of native plants into landscape plans for new development as feasible—especially in areas adjacent to natural areas, such as canyons or scenic roadways. Require preservation of mature trees, as feasible, during design and construction.	INCONSISTENT. While the residential area is adjacent to natural areas, the proposed project and variant contain a 70-foot zone that would function as defensible space. Plant palettes for the residential component contain some native plants (e.g., *rosa California*) but also contain numerous non-native plants (e.g., *pittosporum tobira lomandra confertifolia*, *nerium oldeander*). As a result, there is likely a conflict with policy ERC-10. The site already contains non-native plants (*Deodar cedar*, *Platanus × hispanica*, *Eucalyptus camaldulensis*, *Pinus radiata*, and *Festuca perennis*). Additionally, there would be no environmental impact that occurs as a result of the conflict with this General Plan policy.

General Plan Policy	Consistency Analysis
Implementing Policy ERC-17: If construction activities, including tree removal activities, are required adjacent to or within natural areas (Figure 6-1), then avoid activities during March through June unless a bird survey is conducted to determine that the tree is unused during the breeding season by avian species that are protected under California Fish and Game Codes 3503, 3503.5, and 3511.	INCONSISTENT (CONSISTENT WITH MITIGATION). The proposed project includes potential tree removal within the nesting period. As discussed in Section 3.3, *Biological Resources*, there would be some significant impacts on nesting birds as a result. Therefore, the project as proposed would not be consistent with this policy. However, no impacts would emanate from this inconsistency. Note that the underlying impacts on nesting birds are addressed by Mitigation Measure BIO-1b, which requires that any project-related activation between February 1 and August 31 be constrained in areas with active nests as determined by a preconstruction survey. It is important to note this mitigation is needed to address the actual biological resources impacts rather than the inconsistency with Implementing Policy ERC-17, which alone does not constitute an impact under CEQA. However, with this mitigation measure, the proposed project would be consistent with Implementing Policy ERC-17.
Implementing Policy ERC-19: Regulate new development—specifically industrial uses—as well as construction and demolition practices to minimize pollutant and sediment concentrations in receiving waters and ensure waterbodies within San Bruno and surface water discharged into San Francisco Bay meets or exceeds relevant regulatory water quality standards.	CONSISTENT. As discussed in Section 3.9, *Hydrology and Water Quality*, under Impact WQ-1, compliance with existing safety regulations would reduce the potential for hazardous materials releases. Construction activities at both the recreation facility and in the residential area would require coverage under the statewide National Pollutant Discharge Elimination System (NPDES) General Permit for Discharge of Stormwater Associated with Construction Activity (Construction General Permit) and implementation of a Stormwater Pollution Prevention Plan (SWPPP).
Implementing Policy ERC-20: Require implementation of Best Management Practices to reduce accumulation of non-point source pollutants in the drainage system originating from streets, parking lots, residential areas, businesses, and industrial operations.	CONSISTENT. As discussed in Impact WQ-1, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court. Under the project variant, the primary stormwater treatment basin would instead be located in a triangular-shaped 0.72-acre parcel owned and maintained by the Homeowners Association (HOA). The new private storm drain line would continue to connect to the existing private storm drain line off Keefe Court. Impacts of the project variant would be similar to those of the proposed project given the similarity in disturbed areas and project components.

General Plan Policy	Consistency Analysis
Implementing Policy ERC-23: Regulate new development to minimize stormwater runoff rates and volumes generated by impervious surfaces, and maximize recharge of local groundwater aquifers when feasible. Utilize the recommendations provided in the Bay Area Stormwater Management Agency's Start at the Source Design Guidance Manual for Stormwater Quality Protection.	CONSISTENT. As discussed in Impact WQ-1, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court. Under the project variant, the primary stormwater treatment basin would instead be located in a triangular-shaped 0.72-acre parcel owned and maintained by the HOA. The new private storm drain line would continue to connect to the existing private storm drain line off Keefe Court. Impacts of the project variant would be similar to those of the proposed project given the similarity in disturbed areas and project components.
Implementing Policy ERC-24: 4 Require that new development incorporate features into site drainage plans that reduce impermeable surface area and surface runoff volumes. Such features may include: • Additional landscaped areas including canopy trees and shrubs; • Reducing building footprint; • Removing curbs and gutters from streets and parking areas where appropriate to allow stormwater sheet flow into vegetated areas; • Permeable paving and parking area design; • Stormwater detention basins to facilitate infiltration; and • Building integrated or subsurface water retention facilities to capture rainwater for use in landscape irrigation and other non-potable uses.	CONSISTENT. As discussed in Impact WQ-1, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court. Under the project variant, the primary stormwater treatment basin would instead be located in a triangular-shaped 0.72-acre parcel owned and maintained by the HOA. The new private storm drain line would continue to connect to the existing private storm drain line off Keefe Court. Impacts of the project variant would be similar to those of the proposed project given the similarity in disturbed areas and project components.
Implementing Policy ERC-25: Maintain and improve air quality by requiring project mitigation, such as Transportation Demand Management (TDM) techniques, where air quality impacts are unavoidable.	CONSISTENT. There would be no significant unavoidable impacts on air quality, as demonstrated in Section 3.2, *Air Quality*.

General Plan Policy	Consistency Analysis
Implementing Policy ERC-26: Require dust abatement actions for all new construction and redevelopment projects.	INCONSISTENT (CONSISTENT WITH MITIGATION). The project as designed does not include dust abatement, which would conflict with this policy. Note that the underlying impacts related to fugitive dust are addressed by Mitigation Measure AQ-1, which requires implementation of Bay Area Air Quality Management District (BAAQMD) basic best management practices for construction-related fugitive dust emissions. It is important to note this mitigation is needed to address the actual fugitive dust impacts rather than the inconsistency with Implementing Policy ERC-26, which alone does not constitute an impact under CEQA. However, with this mitigation measure, the proposed project would be consistent with Implementing Policy ERC-26.
Implementing Policy ERC-30: Encourage new residential developments to incorporate measures such as shuttle services to major employment centers, commercial areas and transit areas, and provision of adequate transit facilities.	CONSISTENT. While this policy encourages shuttle services and provision of adequate transit facilities, it does not mandate or require them.
Implementing Policy ERC-33: Require all large construction projects to mitigate diesel exhaust emissions through use of alternate fuels and control devices.	CONSISTENT. As demonstrated in Section 3.2, *Air Quality,* the proposed project would not result in significant exhaust-related air quality impacts. CEQA requires mitigation only for significant impacts. Therefore, mitigation is not required for exhaust-related air quality emissions.
Implementing Policy ERC-39: Continue to protect archaeological sites and resources from damage. Require that areas found to contain significant indigenous artifacts be examined by a qualified archaeologist for recommendations concerning protection and preservation.	INCONSISTENT (CONSISTENT WITH MITIGATION). No archaeological sites or resources are known on the project site; however, excavation has the potential to uncover archaeological sites and resources as well as indigenous artifacts. The proposed project does not contain protective measures such as those required by this policy. Note that the underlying impacts related to undiscovered cultural resources are addressed by Mitigation Measure CUL-2b, which requires a qualified archaeologist to examine and make treatment recommendations for any uncovered resources. It is important to note this mitigation is needed to address the actual cultural resources impacts rather than the inconsistency with Implementing Policy ERC-39, which alone does not constitute an impact under CEQA. However, with this mitigation measure, the proposed project would be consistent with Implementing Policy ERC-39.

General Plan Policy	Consistency Analysis
Implementing Policy ERC-45: If, prior to grading or construction activity, an area is determined to be sensitive for paleontological resources, retain a qualified paleontologist to recommend appropriate actions. Appropriate action may include avoidance, preservation in place, excavation, documentation, and/or data recovery, and shall always include preparation of a written report documenting the find and describing steps taken to evaluate and protect significant resources.	INCONSISTENT (CONSISTENT WITH MITIGATION). The project site is underlain by the Merced Formation, which is known to contain many fossils. There are no known paleontological resources on site; however, excavation has the potential to uncover paleontological resources. The proposed project does not contain protective measures such as those required by this policy. Note that the underlying impacts related to undiscovered paleontological resources are addressed by Mitigation Measure GEO-4, which requires a qualified paleontological resources specialist to assess any discovered resources and make a treatment recommendation. It is important to note this mitigation is needed to address the actual paleontological resources impacts rather than the inconsistency with Implementing Policy ERC-45, which alone does not constitute an impact under CEQA. However, with this mitigation measure, the proposed project would be consistent with Implementing Policy ERC-45.
Health and Safety Element	
Health and Safety Element: General Policy Consistency	CONSISTENT. Policies in the Health and Safety Element of the San Bruno General Plan adopted with the purpose of avoiding or mitigating environmental impacts include policies that seek to reduce the risk of loss of life, injuries, loss of property, or resources due to natural hazards including geologic and seismic, flooding, and wildfire hazards and hazardous materials; and reduce the impact of noise from automotive vehicles, SFO, railroad lines, and stationary sources. The project would be required to comply with General Plan policies governing health and safety and is therefore consistent with these policies. As shown in the resource sections of Chapter 3, the project would not result in significant environmental impacts on hazards/hazardous materials, hydrology, or wildfire. Furthermore, as discussed in Section 3.11, *Noise*, the health and environmental impacts associated with noise would be less than significant if accompanied by the appropriate mitigation measures.

General Plan Policy	Consistency Analysis
Guiding Policy HS-B: Reduce the potential for damage from geologic hazards through appropriate site design and erosion control.	CONSISTENT. As discussed in Impact WQ-1, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court. Under the project variant, the primary stormwater treatment basin would instead be located in a triangular-shaped 0.72-acre parcel owned and maintained by the HOA. The new private storm drain line would continue to connect to the existing private storm drain line off Keefe Court. Additionally, the project design would comply with standard engineering and seismic safety design techniques, in accordance with the California Building Code (CBC), as well as applicable Building and Fire Codes adopted by the City of San Bruno to address site-specific geologic conditions. Impacts of the project variant would be similar to those of the proposed project given the similarity in disturbed areas and project components.
Implementing Policy HS-1: Regulate development, including remodeling or structural rehabilitation, to assure adequate mitigation of safety hazards on sites having a history or threat of slope instability, erosion, subsidence, seismic dangers (including those resulting from liquefactions, ground failure, ground rupture), flooding, and/or fire hazards.	CONSISTENT. The project design would comply with standard engineering and seismic safety design techniques, in accordance with the CBC, as well as applicable Building and Fire Codes adopted by the City of San Bruno to address site-specific geologic conditions
Implementing Policy HS-3: Require geotechnical investigation of all sites, except single-family dwellings, proposed for development in areas where geologic conditions or soil types are subject to landslide risk, slippage, erosion, liquefaction, or expansive soils. (Require submission of geotechnical investigation and demonstration that the project conforms to all recommended mitigation measures prior to City approval.	CONSISTENT. The applicant for the residential component of the proposed project has prepared a geotechnical investigation, even though the project contains single-family homes.
Implementing Policy HS-4: Prevent soil erosion by retaining and replanting vegetation, and by siting development to minimize grading and land form alteration.	CONSISTENT. Landscaping would be provided around homes and in the perimeter area once homes are constructed. The site is graded due to its past uses, and would therefore minimize grading for the proposed project

General Plan Policy	Consistency Analysis
Implementing Policy HS-5: Require preparation of a drainage and erosion control plan for land alteration and vegetation removal on sites greater than 10,000 sq. ft. in size.	CONSISTENT. San Bruno Municipal Code section 12.08.010 requires a grading permit for the proposed project, and is listed in Section 2.5, *Required Approvals*. San Bruno Municipal Code section 12.12.050 requires a complete and detailed plan for erosion control with grading plans. Therefore, an erosion control plan would be prepared. The project plan set and project variant plan set submitted by the applicant also has a preliminary stormwater control plan.
Implementing Policy HS-18: Require developers to implement erosion and sedimentation control measures to maintain an operational drainage system, preserve drainage capacity, and protect water quality.	CONSISTENT. As discussed in Impact WQ-1, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court. Under the project variant, the primary stormwater treatment basin would instead be located in a triangular-shaped 0.72-acre parcel owned and maintained by the HOA. The new private storm drain line would continue to connect to the existing private storm drain line off Keefe Court. Impacts of the project variant would be similar to those of the proposed project given the similarity in disturbed areas and project components.
Implementing Policy HS-22: Require that construction-related grading and other activities comply with the Association of Bay Area Governments' (ABAG) Manual of Standards for Erosion and Sediment Control Measures and with the California Stormwater Quality Association (CASQA), Stormwater Best Management Practice Handbook for Construction.	CONSISTENT. As discussed in Impact WQ-1, compliance with existing safety regulations would reduce the potential for hazardous materials releases. Construction activities at both the recreation facility and in the residential area would require coverage under the statewide NPDES General Permit for Discharge of Stormwater Associated with Construction Activity (Construction General Permit) and implementation of a SWPPP. The California Stormwater Quality Association's *Stormwater Best Management Practice Handbook for Construction* is designed to aid in compliance with stormwater regulations for the Construction General Permit and also contains a SWPPP template. A soils and engineering report is required per municipal code section 12.08.030. Per municipal code section 12.12.010, it must include draft specifications for erosion control measures, referencing the ABA Manual for Surface Runoff Control Measures.
Implementing Policy HS-36: Encourage developers of new residential projects to provide noise buffers other than sound walls, such as vegetation, storage areas, or parking, as well as site planning and locating bedrooms away from noise sources.	CONSISTENT. While this policy encourages noise buffers other than sound walls, it does not mandate or require them, nor does the proposed project or project variant include them. Homes are located away from noise sources, such as the recreation field.

General Plan Policy	Consistency Analysis
Public Facilities and Services Element	
Public Facilities and Services Element: General Policy Consistency	CONSISTENT. Policies in the Public Facilities and Services Element of the San Bruno General Plan adopted with the purpose of avoiding or mitigating environmental impacts include policies that seek to coordinate the provision of public services to all city residents; ensure that the city's water supply, wastewater collection and treatment, and solid waste collection systems provide adequate service; provide adequate public safety service for all San Bruno properties; provide public schooling for youth; and provide library materials and services. The project would include drought-tolerant and/or native landscaping, water-conserving irrigation systems including climate-sensitive controllers in common areas, and biological treatment of stormwater runoff. The project includes implementation of a wildfire management vegetation management plan within the wooded slope area of the project site.
Implementing Policy PFS-38: Ensure proper maintenance of the open space areas in western residential neighborhoods. Vegetation maintenance is necessary to prevent potential fire hazards.	CONSISTENT. The sloped open space area would be managed pursuant to a vegetation management plan. Additionally, while the residential area is adjacent to natural areas, the proposed project and variant contain a 70-foot zone that would function as defensible space.
Implementing Policy PFS-39: Minimize risks to single-access residential neighborhoods by providing alternative access for fire and other emergency personnel.	CONSISTENT. The project site has two points of access on public streets on either end of Courtland Drive. Additionally, two common area parcels located along the western portion of the project site would provide access for the fire department to the natural open space parcel and for ongoing maintenance and site safety.
Implementing Policy PFS-63: Require that all new development complies with California's Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24, Part 6).	CONSISTENT. The proposed project would comply with CBC standards related to energy efficiency because it is a required standard.

General Plan Policy	Consistency Analysis
Implementing Policy PFS-65: Require new development to incorporate passive heating and natural lighting strategies if feasible and practical. These strategies should include, but are not limited to, the following: • Using building orientation, mass and form, • including façade, roof, and choice of building materials, color, type of glazing, and insulation to minimize heat loss during winter months and heat gain during the summer months; • Designing building openings to regulate internal climate and maximize natural lighting, while keeping glare to a minimum; and • Reducing heat-island effect of large concrete roofs and parking surfaces.	CONSISTENT. The proposed project would include energy efficient windows and insulation. The proposed project and project variant's residential component consists of new single family residential homes and so components like building orientation, mass and form are difficult to implement on the project site. There are no concrete roofs proposed, and parking surfaces would be adjacent to roadways.
Implementing Policy PFS-66: Enforce landscape requirements that facilitate efficient energy use or conservation, such as drought-resistant landscaping and/or deciduous trees along southern exposures.	CONSISTENT. Front yards would have drought-tolerant trees and plants, and the project would have drought-tolerant and/or native landscaping, water-conserving irrigation systems (with climate-sensitive controllers in common areas) and biological treatment of stormwater runoff.

General Plan Policy	Consistency Analysis
Housing Element	
Sixth Cycle Housing Element (2023-2031): General Policy Consistency	CONSISTENT. Policies in the Housing Element of the San Bruno General Plan adopted with the purpose of avoiding or mitigating environmental impacts include goals and policies that seek to accommodate regional housing needs through a community-wide variety of residential uses by size, type, tenure, affordability, and location. The prior Housing Element's Program 2-D also specifically promoted construction of housing on the Crestmoor High School campus. The project would develop 155 housing units (including 8 at low-income level and 16 at moderate-income level) on the site of the former Crestmoor High School, thereby increasing the opportunity for the City to meet housing needs, consistent with the intent of the Housing Element and the prior Housing Element's Program 2-D. The sites inventory in San Bruno's Housing Element identifies areas in the city suitable for residential development. The sites Inventory does not indicate that San Bruno must develop housing on those sites to meet the City's Regional Housing Needs Allocation (RHNA), or foreclose development on other sites. The Crestmoor High School site is mentioned in the City's Housing Element as an example of a housing opportunity on a former school site, but is not included in the sites inventory. The residences developed on the site could help the City meet its current RHNA requirements. The project is therefore consistent with the policy direction of the Housing Element to accommodate regional housing needs.

Source: City of San Bruno 2009; City of San Bruno 2023.

3.11 Noise

This section describes the environmental and regulatory setting for noise and vibration in San Bruno as it pertains to the project. It also describes the noise and vibration impacts, if any, that would result from implementation of the project and provides mitigation for significant impacts, where feasible.

3.11.1 Fundamentals of Environmental Noise and Vibration

Overview of Noise and Sound

Noise is commonly defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological impact on human health. Because noise is an environmental pollutant that can interfere with human activities, an evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy (vibration) transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters, including the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor for characterizing the loudness of an ambient (existing) sound level. Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called *A-weighting*, written as *dBA* and referred to as *A-weighted decibels*. Table 3.11-1 defines sound measurements and other terminology used in this chapter, and Table 3.11-2 summarizes typical A-weighted sound levels for different noise sources.

Table 3.11-1. Definition of Sound Measurements

Sound Measurements	Definition
Decibel (dB)	A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude with respect to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
C-Weighted Decibel (dBC)	The sound pressure level in decibels as measured using the C-weighting filter network. The C-weighting is very close to an unweighted or *flat* response. C-weighting is used only in special cases (i.e., when low-frequency noise is of particular importance). A comparison of the measured A- and C-weighted levels gives an indication of low-frequency content.
Maximum Sound Level (L_{max})	The maximum sound level measured during the measurement period.
Minimum Sound Level (L_{min})	The minimum sound level measured during the measurement period.
Equivalent Sound Level (L_{eq})	The equivalent steady-state sound level that in a stated period of time would contain the same acoustical energy.
Percentile-Exceeded Sound Level (L_{xx})	The sound level exceeded X% of a specific time period. L_{10} is the sound level exceeded 10% of the time, and L_{90} is the sound level exceeded 90% of the time. L_{90} is often considered to be representative of the background noise level in a given area.
Day-Night Level (L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
Vibration Velocity Level (or Vibration Decibel Level, VdB)	The root-mean-square velocity amplitude for measured ground motion expressed in dB.
Peak Particle Velocity (Peak Velocity or PPV)	A measurement of ground vibration, defined as the maximum speed (measured in inches per second) at which a particle in the ground is moving relative to its inactive state. PPV is usually expressed in inches per second (in/sec).
Frequency: Hertz (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.

Table 3.11-2. Typical A-weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—110—	Rock band
Jet flyover at 1,000 feet		
	—100—	
Gas lawnmower at 3 feet		
	—90—	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	—80—	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower at 100 feet	—70—	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	—60—	
		Large business office
Quiet urban daytime	—50—	Dishwasher in next room
Quiet urban nighttime	—40—	Theater, large conference room (background)
Quiet suburban nighttime		
	—30—	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	—20—	
		Broadcast/recording studio
	—10—	
	—0—	

Source: Caltrans 2013.

In general, human sound perception is such that a change in sound level of 1 dB cannot typically be perceived by the human ear, a change of 3 dB is barely noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level as it increases or decreases, respectively (Leduc 2018).

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (such as L_{10}, L_{20}), and the day-night sound level (L_{dn}). The CNEL L_{dn} and CNEL values differ by less than 1 dB. Thus, as a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such. These measurements are defined in Table 3.11-1.

For a point source, such as a stationary compressor or a piece of construction equipment, sound attenuates (lessens in intensity), based on geometry, at a rate of 6 dB per doubling of distance. For a line source, such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance perpendicular to the source (Caltrans 2013). Atmospheric conditions, including wind, temperature gradients, and humidity, can change how sound propagates over distance and can

affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate than sound that travels over a hard surface such as pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers such as buildings or topographic features that block the line of sight between a source and receiver also increase the attenuation of sound over distance.

Community noise environments are generally perceived as *quiet* when the 24-hour average noise level is below 45 dBA, *moderate* in the 45 to 60 dBA CNEL range, and *loud* above 60 dBA CNEL. Very noisy urban residential areas are usually around 70 dBA CNEL. Along major thoroughfares, roadside noise levels are typically between 65 and 75 dBA CNEL. Incremental changes of 3 to 5 dB in the existing 1-hour L_{eq}, or the CNEL, are commonly used as thresholds for an adverse community reaction to a noise increase. However, there is evidence that incremental thresholds in this range may not be sufficiently protective in areas where noise-sensitive uses are located and CNEL is already high (i.e., above 60 dBA). In these areas, limiting noise increases to 3 dB or less is recommended (FTA 2018). Noise intrusions that cause short-term interior noise levels to rise above 45 dBA at night can disrupt sleep. Exposure to noise levels greater than 85 dBA for 8 hours or longer can cause permanent hearing damage.

Overview of Groundborne Vibration

Operation of heavy construction equipment, particularly pile-driving equipment and other impact devices (e.g., pavement breakers), creates seismic waves that radiate along the surface of and downward into the ground. These surface waves can be felt as ground vibration. Vibration from the operation of this type of equipment can result in effects that range from annoyance for people to damage for structures. Variations in geology and distance result in different vibration levels, including different frequencies and displacements. In all cases, vibration amplitudes decrease with increased distance.

Perceptible groundborne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they cause rock and soil particles to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of vibration amplitude, referred to as peak particle velocity (PPV).

Vibration amplitude attenuates over distance. This is a complex function of how energy is imparted into the ground and the soil or rock conditions through which the vibration is traveling. The following equation is used to estimate the vibration level at a given distance for typical soil conditions (FTA 2018). PPV_{ref} is the reference PPV at 25 feet (Table 3.11-3).

$$PPV = PPV_{ref} \times (25/Distance)^{1.5}$$

Table 3.11-3. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 Feet	PPV at 50 Feet	PPV at 75 Feet	PPV at 80 Feet	PPV at 100 Feet
Auger drill	0.089	0.0315	0.0171	0.016	0.011
Hoe ram	0.089	0.0315	0.0171	0.016	0.011
Large bulldozer	0.089	0.0315	0.0171	0.016	0.011
Loaded trucks	0.076	0.0269	0.0146	0.013	0.010
Jackhammer	0.035	0.0124	0.0067	0.006	0.004
Small bulldozer	0.003	0.0011	0.0006	0.001	0.0004

Source: FTA 2018.

Table 3.11-3 summarizes typical vibration levels generated by construction equipment (FTA 2018) at the reference distance of 25 feet and other distances, as determined with use of the attenuation equation. Tables 3.11-4 and 3.11-5 summarize the guidelines developed by the California Department of Transportation (Caltrans) for damage and annoyance potential from the transient and continuous vibration that is usually associated with construction activity. The activities that are typical of continuous vibration include the use of excavation equipment, static compaction equipment, tracked vehicles, vehicles on a highway, and vibratory compaction equipment. The activities that are typical of single-impact (transient) or low-rate, repeated impact vibration include the use of drop balls, blasting, and the use of impact pile drivers, "pogo stick" compactors, and crack-and-seat equipment (Caltrans 2020).

Table 3.11-4. Vibration Damage Potential Threshold Criteria Guidelines

	Maximum PPV (in/sec)	
Structure and Condition	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Caltrans 2020.
Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 3.11-5. Vibration Annoyance Potential Criteria Guidelines

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: Caltrans 2020.
Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

3.11.2 Existing Conditions

Regulatory Setting

Federal

No federal laws, regulations, or policies for construction-related noise and vibration directly apply to the proposed project. However, the Federal Interagency Commission on Noise (FICON) has developed a graduated scale for use in the assessment of project related noise level increases. The criteria shown in Table 3.11-6 was developed by FICON as a means of developing thresholds for impact identification for noise level increases related to ongoing project operations. The FICON standards have been used extensively in recent years in the preparation of the noise sections of environmental impact reports (EIRs) that have been certified in many California cities and counties.

The use of the FICON standards is considered conservative relative to thresholds used by other agencies in the State of California. For example, Caltrans requires a project related traffic noise level increase of 12 dB for a finding of significance, and the California Energy Commission (CEC) considers project related noise level increases between 5 and 10 dB significant, depending on local factors. Therefore, the use of the FICON standards, which set the threshold for finding significant noise impacts as low as 1.5 dB, provides a very conservative approach to impact assessment for this project.

Table 3.11-6. FICON Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (L_{dn})	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60 to 65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more

Source: BAC 2023.

Based on the FICON research, as shown in Table 3.11-6, a 5 dB increase in noise levels due to a project is required for a finding of significant noise impact where ambient noise levels without the project are less than 60 dB L_{dn}. Where pre-project ambient conditions are between 60 and 65 dB L_{dn}, a 3 dB increase is applied as the standard of significance. In addition, in areas already exposed to

higher noise levels, specifically pre-project noise levels in excess of 65 dB L_{dn}, a 1.5 dB increase is considered by FICON as the threshold of significance.

Because construction and demolition activities tend to be short-term in nature, and occur primarily during less sensitive daytime hours, a common practice is to apply a 10 dB threshold of significance to construction-related noise level increases.

State

California Governor's Office of Planning and Research

The *State of California General Plan Guidelines,* published and updated by the Governor's Office of Planning and Research (2017), provides guidelines for evaluating the compatibility of various land uses as a function of community noise exposure. These are guidelines for general land use planning that describe noise acceptability categories for different types of land uses considered by the state. California also requires each local government entity to perform noise studies and implement a noise element as part of its general plan. The purpose of the noise element is to limit the exposure of the community to excessive noise levels; the noise element must be used to guide decisions concerning land use.

California Department of Transportation

Caltrans provides guidelines regarding vibration associated with construction and operation of transportation infrastructure. Although Caltrans guidelines are not directly applicable to the project, they are frequently used to help establish vibration thresholds for development projects because most local agencies do not have vibration-specific guidelines. Table 3.11-4 provides Caltrans' vibration guidelines for potential damage to different types of structures. Table 3.11-5 provides Caltrans' guidelines regarding vibration annoyance potential (expressed as PPV).

Local

San Bruno General Plan

The San Bruno General Plan, adopted in 2009, contains a number of goals and policies related to noise. Specifically, the following policies are relevant to the project.

ERC-3: Protect natural vegetation in park, open space, and scenic areas as wildlife habitat, to prevent erosion, and to serve as noise and scenic buffers.

HS-32: Encourage developers to mitigate ambient noise levels adjacent to major noise sources by incorporating acoustical site planning into their projects. Utilize the City's Building Code to implement mitigation measures, such as:

- Incorporating buffers and/or landscaped berms along high-noise roadways or railways;
- Incorporating traffic calming measures and alternative intersection design within and/or adjacent to the project;
- Using reduced-noise pavement (rubberized asphalt); and
- Incorporating state-of-the-art structural sound attenuation measures.

HS-33: Prevent the placement of new noise sensitive uses unless adequate mitigation is provided. Establish insulation requirements as mitigation measures for all development, per the standards in Table … [reproduced as Table 3.11-7 in this EIR].

HS-36: Encourage developers of new residential projects to provide noise buffers other than sound walls, such as vegetation, storage areas, or parking, as well as site planning and locating bedrooms away from noise sources.

HS-38: Require developers to mitigate noise exposure to sensitive receptors from construction activities. Mitigation may include a combination of techniques that reduce noise generated at the source, increase the noise insulation at the receptor, or increase the noise attenuation rate as noise travels from the source to the receptor.

HS-43: Allow reasonable latitude for noise generated by uses that are essential to community health, safety, and welfare, such as emergency vehicle operations and sirens.

The General Plan also includes noise standards, shown in Table 3.11-7, that apply to areas outside of the airport noise impacted areas.

Table 3.11-7. Land Use Compatibility for Community Noise Environments

Land Use Category	Exterior Day/Night Noise Levels, L_{dn} (dB)						
	55	60	65	70	75	80	
Residential – Single Family							
Residential –Multiple Family							
Transient Lodging – Motels, Hotels							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheaters							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business, Commercial and Professional							
Industrial Manufacturing, Utilities, Agriculture							

INTERPRETATION

	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.
	Normally Unacceptable	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development should not be undertaken.

San Bruno Municipal Code

The San Bruno Municipal Code contains regulations pertaining to noise in Section 6.16, *Noise Regulations*. That section discusses quantitative noise limits for various noise sources in the jurisdiction. The following Municipal Code guidelines are relevant to the project.

6.16.030, Ambient Noise Level Limits

Where the ambient noise level is less than designated in this section, the respective noise level shall govern (Sound Level A, decibels). Residential zone: 10:00 p.m. to 7:00 a.m., 45 dB; 7:00 a.m. to 10:00 p.m., 60 dB. (Ordinance 1354, Section 1; prior code: Section 16-4.3)

6.16.050, Noise Levels Exceeding Ambient Base Level

Any noise level exceeding the zone ambient base level at the property plane of any property, or exceeding the zone ambient base level on any adjacent residential area zone line or at any place of other property (or, if a condominium or apartment house, within any adjoining apartment), by more than 10 dB shall be deemed to be prima facie evidence of a violation of the provisions of this chapter. However, during the period of 7:00 a.m. to 10:00 p.m., the ambient base level may be exceeded by 20 dB for a period not to exceed 30 minutes during any 24-hour period. (Ordinance 1354, Section 1; prior code: Section 16-4.1-5)

6.16.060, Machinery Noise Levels

No person shall operate any machinery, equipment, pump, fan, air-conditioning apparatus, or similar mechanical device in any manner so as to create any noise that would cause the noise level at the property plane of any property to exceed the ambient base noise level by more than 10 dB. However, during the period of 7:00 a.m. to 10:00 p.m., the ambient base level may be exceeded by 20 dB for a period not to exceed 30 minutes during any 24-hour period. (Ordinance 1354, Section 1; prior code: Section 16-4.6)

6.16.070, Construction of Buildings and Projects

No person shall, within any residential zone, or within a radius of 500 feet therefrom, operate equipment or perform any outside construction or repair work on any building, structure, or other project or operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction-type device that shall exceed between the hours of 7:00 a.m. and 10:00 p.m. a noise level of 85 dB, as measured at 100 feet, or exceed between the hours of 10:00 p.m. and 7:00 a.m. a noise level of 60 dB, as measured at 100 feet, unless such person shall have first obtained a permit therefor from the director of public works. No permit shall be required to perform emergency work. (Ordinance 1354, Section 1; prior code: Section 16-4.7)

6.16.080, Public Areas

A. No source of sound, including, but not limited to, amplifiers and other musical devices, shall exceed seventy decibels at a distance of fifty feet from the source of the sound between the hours of eleven a.m. and four p.m. unless a permit shall first have been obtained from the city council.

B. No source of sound, including, but not limited to, amplifiers and other musical devices, shall exceed sixty decibels at a distance of fifty feet from the source of the sound between the hours of four p.m. and eleven a.m. unless a permit shall first have been obtained from the city council. (Ordinance 1897 Section 3, 2021; Ordinance 1354 Section 1; prior code Section 16-4.8)

San Francisco International Airport Land Use Compatibility Plan

The Airport Land Use Compatibility Plan (ALUCP) for SFO was adopted in 2012 as the Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport. The SFO ALUCP was developed to align with the guidance provided by the U.S. Department of Transportation, Division of Aeronautics, and the Federal Aviation Administration. Its purpose is to establish planning boundaries around SFO that define noise for policy implementation and require notification of SFO proximity in real estate transactions (City/County Association of Governments of San Mateo County 2012). Airport and aircraft operations' noise is a significant concern for airport land use commissions, particularly in densely populated regions like the Bay Area.

The SFO ALUCP includes policies and standards to protect people living in the vicinity of SFO from the effects of aircraft noise (City/County Association of Governments of San Mateo County 2012). Policy NP-2, Airport/Land Use Compatibility Criteria, establishes criteria to determine the compatibility of proposed land uses in the Airport Noise Compatibility Zones. For new detached single-family residential uses, the ALUCP establishes aircraft noise levels of 65 CNEL as being acceptable without restrictions.

Environmental Setting

Existing Land Uses

The project site is located at 300 Piedmont Avenue in San Bruno and currently contains the former Crestmoor/Peninsula High School building as well as playing fields, parking lots, a storage lot, school district maintenance facilities, and unimproved sloping wooded open space. Interstate 280 (I-280) runs directly east of Courtland Drive and a wooded area, with the San Bruno Chinese Church located between Courtland Drive and I-280 near the northern entrance to the project site. Existing single-family subdivisions neighbor the project site to the north, west, and south across significant grade changes, with a wooded hillside buffer that will remain in place with either the project and the variant. The school facility has no current use, however there is current field use.

The San Mateo Union High School District currently leases the existing playing fields on the northern portion of the project site on a short-term basis to private soccer clubs for youth soccer games and practices. Chapter 2, Project Description, contains information about the current use of playing fields. For Lowen 83, the earliest games started at 9:00 a.m., and the latest games were scheduled to start at 6:30 p.m. Lowen 83 also holds practices Monday through Thursdays from 4:30 to 7:30 p.m. For AYSO, the earliest games started at 9:00 a.m., and the latest game was scheduled to start at 4:00 p.m. and scheduled to end by 5:15 p.m. Other games are also played back-to-back. Practices occur throughout the week, depending on each team coach's schedule.

The playing fields are improved with natural grass. The parking lot adjacent to the fields serves the private soccer club members that use the playing fields; additional parking is available on (parallel parking) and perpendicular to Courtland Drive in unimproved dirt areas to the east. During winter months, the soccer clubs utilize portable flood lights to light portions of the playing fields to extend playing time after sunset. Use of the fields for private soccer activities varies by time of year.

Existing Ambient Noise Environment

The existing ambient noise environment in the vicinity of the project site is defined primarily by local traffic and, to a lesser extent, by existing playing field activities at the northern end of the

project site and aircraft overflights associated with SFO operations. Because I-280 is depressed approximately 100 feet relative to the project site and completely shielded from view by extensive intervening topography which forms a natural earthen barrier between the project site and I-280, noise from I-280 does not appreciably affect the project site.

To quantify existing ambient noise levels at and around the project site, long-term (24-hour) ambient noise measurements were conducted at four residential locations surrounding the project site from Saturday, April 15 through Monday, April 17, 2023, a period of 72 consecutive hours at each location. Because playing field activities at the project site are most intensive during weekend periods, the long-term ambient noise survey was specifically conducted to include a complete weekend period.

The long-term noise measurement locations are shown on Figure 3.11-1. Larson Davis Laboratories (LDL) Model 820, LxT and 831 precision integrating sound level meters were used to complete the noise level measurement surveys. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4). Photographs of the long-term noise survey locations are provided in Appendix B-1 of the *Noise and Vibration Impact Assessment for Crestmoor, 300 Piedmont Avenue Development* (Noise Technical Report; BAC 2023), included in Appendix F, *Noise Technical Report*.

Table 3.11-8 summarizes the long-term noise survey results. A complete listing of the long-term ambient survey results is provided in tabular and graphical formats in Appendices C and D, respectively, of the Noise Technical Report (included in Appendix F). The Table 3.11-8 data indicate that measured daytime maximum and average noise levels in the project vicinity were typically in the 60s and low 50s dBA, respectively, with L_{dn} values ranging from 50 to 60 dBA.

Existing Playing Field Noise Environment

In addition to the long-term ambient noise survey, short-term noise level measurements were conducted at two locations on the project site on the morning of Saturday, April 15, 2023. Figure 3.11-1 shows the short-term noise measurement locations. These measurements were specifically conducted to quantify the noise generation of soccer games occurring at the project site, and the microphones were approximately 75 feet from the edge of the soccer field at both locations. The 75-foot distance was selected as it represents the distance from the nearest spectator location on the northern soccer field to the nearest existing residential property line to the north. An LDL Model 831 precision integrating sound level meter was used to complete the short-term noise level measurement surveys. The meter was calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. Photographs of the short-term noise survey locations are provided in Appendix F, *Noise Technical Report*. Table 3.11-8 summarizes the short-term noise survey results.

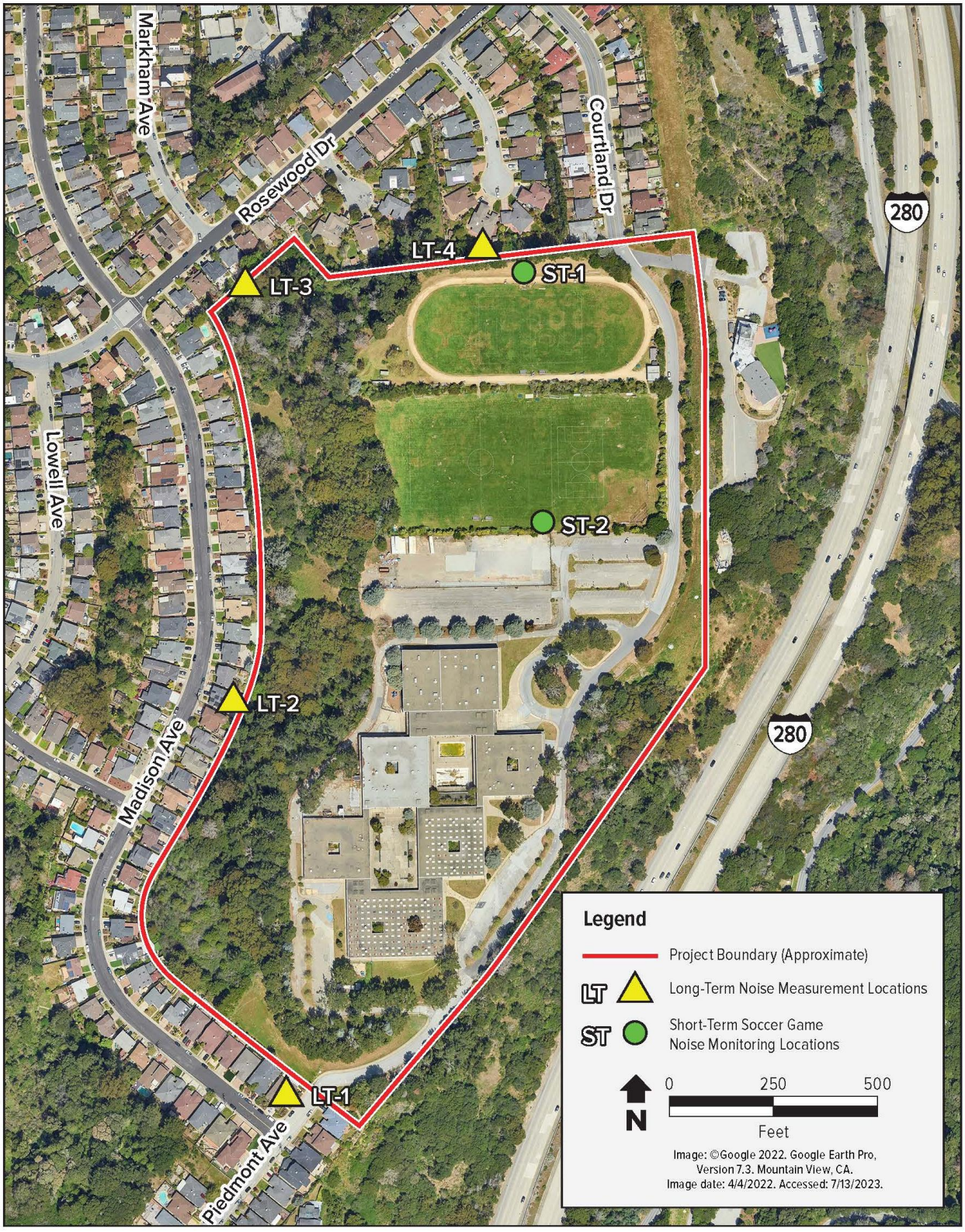


Figure 3.11-1. Project Location and Noise Measurement Sites

Table 3.11-8. Baseline Ambient Noise Survey Results for April 15–17, 2023

			Daytime (7:00 a.m. to 10:00 p.m.)			Nighttime (10:00 p.m. to 7:00 a.m.)			
Site[a]	Address	Date	L_{max}	L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{dn}
LT-1	100 Madison Ave	4/15/2023	65	48	46	57	42	37	50
		4/16/2023	66	49	46	59	42	38	50
		4/17/2023	69	54	48	58	45	40	55
		Average	67	51	47	58	43	38	52
LT-2	210 Madison Ave	4/15/2023	63	50	48	56	42	38	51
		4/16/2023	67	53	48	57	44	40	53
		4/17/2023	63	49	46	57	45	41	52
		Average	65	51	47	57	43	40	52
LT-3	2263 Rosewood Dr	4/15/2023	62	49	46	56	41	37	50
		4/16/2023	64	50	47	57	44	39	52
		4/17/2023	67	61	48	59	45	41	60
		Average	65	53	47	57	43	39	54
LT-4	181 Glenbrook Ln	4/15/2023	60	49	48	56	43	39	51
		4/16/2023	61	49	48	57	46	41	53
		4/17/2023	61	49	47	57	45	42	52
		Average	61	49	47	57	45	41	52

[a] Noise measurement site locations are illustrated on Figure 3.11-1.
Source: BAC 2023.

Table 3.11-9. Short-Term Ambient Noise Survey Results for Saturday, April 15, 2023

		Measured Sound Levels (dBA)		
Site[a]	Time[b]	L_{max}	L_{eq}	L_{50}
1	9:22 a.m.	63	54	53
	9:25 a.m.	69	55	54
	9:30 a.m.	69	56	55
	9:35 a.m.	70	57	54
	9:40 a.m.	65	56	55
	9:45 a.m.	65	55	54
	9:50 a.m.	68	56	54
	9:55 a.m.	68	56	54
	10:00 a.m.	69	56	53
	10:05 a.m.	70	56	53
	10:10 a.m.	69	57	55
	10:15 a.m.	66	55	54
	10:20 a.m.	55	50	49
	10:25 a.m.	59	52	51
	10:30 a.m.	56	53	53
	Average	65	55	53
2	10:36 a.m.	67	54	52
	10:40 a.m.	75	60	55
	10:45 a.m.	75	62	57
	10:50 a.m.	74	61	58
	10:55 a.m.	73	64	61
	11:00 a.m.	73	61	58
	11:05 a.m.	75	64	61
	11:10 a.m.	66	58	56
	Average	72	61	57

[a] Noise measurement site locations are illustrated on Figure 3.11-1. Each location was approximately 75 feet from the edge of the soccer field.
[b] Measurements for Site 1 and Site 2 were taken while soccer games, which took place at different times over the same day, were underway on the fields nearest the respective sites.
Source: BAC 2023.

The data included in Table 3.11-9 indicates that maximum noise levels measured during the soccer games ranged from 55 to 75 dBA at the measurement distance of 75 feet. Measured 5-minute average noise levels ranged from 50 to 64 dBA L_{eq} during the soccer game noise surveys. Inspection of Appendix D-10 of the Noise Technical Report (included in Appendix F, *Noise Technical Report*, of this EIR) indicates that, during the 9:00 a.m. and 10:00 a.m. hours of Saturday, April 15, when soccer games were taking place, the measured ambient noise levels at the nearest residence to the north (monitoring site LT-4), were unchanged. This is believed to be due to the considerable grade separation (approximately 40 feet) between the soccer fields and nearest residences to the north. That grade separation, which is approximately 40 feet, completely shields the nearest residences to the north from view of the existing soccer fields.

Existing Aircraft Noise Environment

The project site is located approximately 1.6 miles west of SFO. The airport's main flight paths extend well to the north of the project site, as do the airport's noise contours. Figure 6 of the Noise Technical Report (included as Appendix F, *Noise Technical Report*) shows the noise contours for SFO and indicates the project site is located outside of the 60 dBA CNEL airport noise contour. As a result, aircraft overflights to the north of the project site were observed by Bollard Acoustical Consultants, Inc. (BAC) staff to occur frequently. Nonetheless, aircraft noise is well below the ALUCP noise standard of 65 dBA for new residential development. The noise contours are consistent with the long-term ambient noise survey results reported in Table 3.11-8, where L_{dn} values (effectively similar to CNEL) were typically in the low 50s.

Existing Traffic Noise Environment

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to quantify existing traffic noise levels at the existing sensitive land uses nearest to the project area roadway network. The model was also used to quantify the distances to the 60, 65 and 70 dB L_{dn} traffic noise contours for these roadways. The model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop L_{dn} values from L_{eq} values.

Existing traffic data in the form of peak hour intersection turning movements were provided by the project transportation consultant. Those data were converted to Average Daily Traffic (ADT) segment volumes by multiplying the average of the AM and PM movements by a factor of 10. Other inputs were obtained from BAC observations and noise measurement data. The existing traffic noise levels at the distances representing the nearest sensitive land uses to the project area roadways and distances from the centerlines of selected roadways to the 60 dB, 65 dB and 70 dB L_{dn} contours are summarized in Table 3.11-10. Appendix F, *Noise Technical Report*, contains the FHWA model inputs for existing conditions.

Table 3.11-10. Existing Traffic Noise Levels at Nearest Receptors and Distances to L_{dn} Contours

#	Roadway	Description	L_{dn} at Nearest Sensitive Receptor (dB)	Distance to Contour (feet)		
				70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}
1	Skyline Blvd	North of San Bruno Ave W	66	72	154	332
2	Skyline Blvd	South of San Bruno Ave W	66	62	133	286
3	San Bruno Ave W	East of Skyline Blvd	65	33	70	151
4	San Bruno Ave	West of Interstate 280	65	43	94	202
5	San Bruno Ave	East of Interstate 280	68	42	92	197
6	Cunningham Way	South of Jenevein Ave	62	15	32	70
7	Jenevein Ave	East of Cunningham Way	63	16	35	76
8	Jenevein Ave	West of Cunningham Way	62	13	29	63
9	Courtland Dr	Whitman Way to Rosewood Dr	59	7	16	34
10	Whitman Way	East of Courtland Dr	60	10	22	47
11	Whitman Way	West of Courtland Dr	58	7	15	31
12	Courtland Dr	South of Rosewood Dr	57	6	12	27

#	Roadway	Description	L_{dn} at Nearest Sensitive Receptor (dB)	Distance to Contour (feet) 70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}
13	Rosewood Dr	West of Courtland Dr	51	3	6	13
14	Madison Ave	North of Piedmont Ave	44	1	3	5
15	Courtland Dr	East of Madison Ave	49	2	3	7
16	Piedmont Ave	Madison Ave to Crestmoor Dr	49	2	4	9
17	Crestmoor Dr	North of Piedmont Ave	54	5	10	22
18	Crestmoor Dr	South of Piedmont Ave	57	4	10	20

Source: FHWA Traffic Noise Model (FHWA-RD-77-108) with inputs from project traffic impact study. Appendix F, *Noise Technical Report*, contains FHWA model inputs.

Existing Ambient Vibration Environment

As described in Appendix F, *Noise Technical* Report, during site visits conducted, vibration levels within the project vicinity were subjectively evaluated as being below the threshold of perception. In addition, no appreciable sources of vibration were observed to be present in the project vicinity. As a result, the existing ambient vibration environment in the project vicinity is considered to be negligible.

3.11.3 Environmental Impacts

Methods for Analysis

The noise and vibration analysis for the proposed project was completed by BAC and is documented in the Noise Technical Report (BAC 2023; Appendix F, *Noise Technical Report*). The methodology is described where relevant within the impact discussion; refer to Appendix F for additional details on the noise and vibration analysis methodology for the project.

It is foreseeable that the existing leagues that use the fields would continue to use the fields once improved. In addition, the City anticipates that other users would use the facilities in the future, thereby potentially increasing the frequency and duration of the use of the facilities. Additionally, potential future uses could involve amplified noise (e.g., portable small PA system for intermittent use). At this time, however, the City has not identified any certain future users, and therefore cannot define or analyze the parameters and characteristics of the potential additional use (e.g., intensity, time of day, day of week).

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant impact if it would result in any of the following conditions.

- Impact NOI-1: Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies.
- Impact NOI-2: Generation of excessive groundborne vibration or groundborne noise levels.

- Impact NOI-3: For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

Impacts

Noise generated by the project would result from project construction, increases in traffic noise levels on the local roadway network due to project-generated traffic, and noise generated by playing field activities. Residential yard maintenance and refuse collection are common noise sources associated with residential developments, and noise from those sources is already present in the community. As a result, the focus of the assessment of noise impacts upon existing sensitive land uses in the project vicinity is on construction, offsite traffic, and playing field activities. The only appreciable source of vibration generation for the project would be during construction.

Impact NOI-1: Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies? (Construction: Less than Significant with Mitigation) (Operations: Less than Significant)

Construction Noise

During project demolition and construction, heavy equipment would be used for grading excavation, paving, hauling, and building construction, which would increase ambient noise levels during their use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project work area would also vary depending on the proximity of equipment activities to that point. Construction noise impacts from the development of the residential component and the recreational and open space component are evaluated in the following sections. Construction activities for the proposed project and proposed variant would occur on the same project site and involve the same kinds of activities, so construction impacts would be the same. Because construction and demolition activities tend to be short-term in nature, and occur primarily during less sensitive daytime hours, a common practice is to apply a 10 dB threshold of significance to construction-related noise level increases. In addition to applicable ordinances, that 10 dB threshold is also evaluated for this impact as an indicator of a significant noise impact.

Residential Component

Demolition of existing structures and construction of the residential component would require the use of the types of equipment outlined in Table 3.11-11. This table includes the range of maximum noise levels for equipment expected to be used for the project at full-power operation at a distance of 50 feet and 100 feet as well as the predicted maximum equipment noise levels at 175 feet away. Calculations assume a standard spherical spreading loss of 6 dB per doubling of distance for maximum noise levels and a conservative 10 dBA offset to account for the substantial intervening vegetation and topography existing between the project site and nearest residences.

Table 3.11-11. Construction Equipment Reference Noise Levels and Predicted Noise Levels

Equipment Description	Maximum Noise Level at 50 Feet (dBA)[a]	Maximum Noise Level at 100 Feet (dBA)[b]	Predicted Maximum Noise Level at 175 feet (dBA)[c]
Air compressor	80	74	59
Backhoe	80	74	59
Compactor	82	76	61
Concrete mixer	85	79	63
Concrete pump	82	76	61
Dozer	85	79	63
Generator	82	76	61
Grader	85	79	64
Loader	80	74	59
Paver	85	79	64
Pneumatic tools	85	79	64
Saw	76	70	55
Scraper	85	79	64
Truck	84	78	63

Source: FTA 2018, Table 7-1.
[a] The distance between the Recreational and Open Space Component (soccer field) construction and the nearest offsite residences is 50 feet.
[b] The City of San Bruno Municipal Code construction noise thresholds apply at a distance of 100 feet.
[c] The distance between the Residential Component construction and the nearest offsite residences is approximately 175 feet.

Based on the equipment noise levels in Table 3.11-11, maximum noise levels at the nearest existing residential uses to the proposed residential construction (approximately 175 feet away), are expected to range from approximately 55 to 64 dBA L_{max}. Inspection of Table 3.11-11 (which shows approximate noise levels at 50 feet, and 100 feet) indicates that maximum noise levels generated by individual pieces of project construction equipment are not expected to exceed the City's code requirement of 85 dBA at 100 feet. However, if two pieces of equipment were to generate maximum noise levels simultaneously, maximum noise levels would exceed the values shown in Table 3.11-11 by 1 to 3 dB (due to the logarithmic nature of the decibel scale, the addition of two equal noise sources results in a 3 dBA increase). In such a case, the City's 85 dBA standard would still not be exceeded at a reference distance of 100 feet. In addition, maximum noise levels generated by project construction would be in the same range as maximum ambient noise levels measured at the nearest residences to the project site (i.e., 175 feet). As a result, project construction is not predicted to result in substantial short-term increases in maximum noise levels at nearby residences.

Although maximum noise levels from construction activity are not expected to either exceed maximum noise limits for construction or substantially exceed measured baseline maximum noise levels at the nearest offsite residences to the residential construction area during the construction activities likely to generate the highest levels of noise (i.e., site grading), a combination of scrapers, dozers, graders, loaders, and compactors could be in use concurrently. As a result, increases in average noise levels generated during the louder phases of project construction, when such equipment could be used concurrently, were evaluated at the nearest residences to determine if

average construction noise levels would substantially exceed baseline conditions at nearby residences (i.e., 10 dBA or more increase).

Using the FHWA Roadway Construction Noise Model (RCNM, January 2006), the combined average noise level from the equipment types utilized during site grading activities (assuming a combination of scrapers, dozers, graders, loaders, and compactors) was computed to be approximately 63 dBA L_{eq} at the nearest residences.

Although the predicted average noise level of 63 dBA includes a 10 dB offset to account for the combination of vegetation and topography between the proposed residential construction area and the nearest residences, the area of the proposed residential construction is fairly flat and elevated relative to the neighboring residences. As a result, topographic shielding at the nearest residences during site grading activities occurring in more central areas of the site will be substantially greater than 10 dBA. In addition, construction activities for the residential component would be spread out and not concentrated at the nearest positions to existing residences (approximately 175 feet from residential component construction). Therefore, it is likely that actual average construction noise levels would frequently be less than 63 dBA L_{eq} at those residences.

As indicated in Table 3.11-8, existing average daytime noise levels typically ranged from 48 to 54 dBA Leq within the backyards of the nearest residences to the project site, with an overall daytime average of 51 dBA Leq (after omitting the anomalous 61 dBA Leq data point from measurement site 3 on April 17). As such, average noise levels during worst-case project construction activities are predicted to be approximately 10 dBA above measured baseline average noise levels in the residential neighborhood. Noise from construction operations would typically be broad-band in frequency content, similar to the background noise environment, and would not generally be dominated by particularly high- or low-pitched sounds. As a result, and despite the potential 10+ dBA increase during worst case noise-generating construction activities, the perceived increases in average noise levels at the nearest residences are not anticipated to be as dramatic as they would be if the frequencies of construction noise were different than the background noise frequency composition.

Even though project construction activities are not predicted to exceed the San Bruno Municipal Code standards applicable to project construction, because construction could result in short-term increases in average ambient noise levels exceeding 10 dBA at nearby residences during worst-case construction noise-generating activities, this impact is considered **potentially significant** for both the proposed project and project variant, and mitigation would be required*.*

Mitigation Measure NOI-1a: Require Construction Noise Reduction Measures

The following measures shall be incorporated into the project onsite construction activities in order to ensure compliance with the noise standards pertaining to construction noise contained in the City of San Bruno Municipal Code. In cases where a measure is considered infeasible (e.g., construction is needed outside allowable hours), the Planning Director shall review and approve that determination prior to that activity occurring to verify and track compliance with this measure.

- Noise-generating construction activities shall be limited to the hours of 7:00 a.m. to 10:00 p.m., as feasible.

- Combined construction noise for activities that take place between 7:00 a.m. and 10:00 p.m. shall be limited to 85 dBA L_{eq} at a distance of 100 feet from construction activities, as feasible.
- Should noise-generating construction activities be required between 10:00 p.m. and 7:00 a.m., combined construction noise shall be limited to 60 dBA L_{eq} at a distance of 100 feet from construction activities, as feasible.
- Temporary construction noise levels shall not result in an increase of 10 dBA or greater.
- Measures to achieve these performance standards include:
    - All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
    - All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
    - Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
    - Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from existing noise-sensitive uses.
    - Nearby residences that border the project site, and the church located on the east side of Courtland Drive, shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.
    - The name and telephone number of an onsite construction liaison who is available whenever construction is occurring shall be provided through onsite signage and on the notices mailed/delivered to surrounding land uses. If early morning or nighttime construction occurs, and construction noise during this time is found to be intrusive to the community (i.e., if complaints are received), the construction liaison shall take reasonable efforts in a reasonable amount of time to investigate the source of the noise (including measuring noise levels) and require that sensible measures be implemented to correct the problem**.**

Mitigation Measure NOI-1b: Install Temporary Noise Barriers

In the event that investigation of construction noise-related complaints by the construction liaison required by mitigation measure NOI-1a indicates that project construction activities are resulting in increases in ambient noise levels at nearby residential uses of 10 dBA or more, temporary noise barriers shall be installed as close as possible to the noise source or the receptor and positioned within the direct line-of-sight path between the noise source and nearby sensitive receptor(s), if feasible. In cases where this measure is required but considered infeasible (e.g., construction is needed outside allowable hours and noise barriers cannot be installed), the Planning Director shall review and approve that determination prior to that activity occurring to verify and track compliance with this measure. The barrier should be constructed of material that has a surface weight of at least 1 pound per square foot and has an acoustical rating of at least 25 STC (Sound Transmission Class). This can include a temporary

barrier constructed with plywood support on a wood frame, sound curtains supported on a frame, or other comparable material.

Mitigation measures **NOI-1a** and **NOI-1b** require implementation of several measures to reduce noise as experienced at nearby sensitive uses during construction. The mitigation measures are anticipated to reduce the increase in average noise levels at the nearest residences during project construction to less than 10 dBA, which is below the significance criteria. As a result, this impact would be **less than significant with mitigation**.

Recreational and Open Space Component

For the recreational and open space component, it is expected that the worst-case construction phase in terms of noise generation would be during grading. At the residences located to the immediate north of the proposed playing fields (at a distance of approximately 50 feet), using the Table 3.11-11 data and assuming 15 dBA of attenuation provided by intervening topography, predicted maximum noise levels would be approximately 61 to 70 dBA L_{max}. Although construction noise would be temporary in nature, these estimated noise levels from construction activity could substantially exceed baseline ambient noise levels at the nearest residences to the north (monitoring sites LT-3 and LT-4 in Table 3.11-8).

Inspection of Table 3.11-11 indicates that maximum noise levels generated by individual pieces of project construction equipment are not expected to exceed the City's code requirement of 85 dBA at 100 feet. However, if two pieces of equipment were to generate maximum noise levels simultaneously, maximum noise levels would exceed the values shown in Table 3.11-11 by 1 to 3 dB (due to the logarithmic nature of the decibel scale, the addition of two equal noise sources results in a 3 dBA increase). In such a case, the City's 85 dBA standard would still not be exceeded at a reference distance of 100 feet. In addition, maximum noise levels generated by project construction would be in the same range as maximum ambient noise levels measured at the nearest residences to the north of the project site. As a result, project construction is not predicted to result in substantial short-term increases in maximum noise levels at nearby residences.

During the construction activities likely to generate the highest levels of noise (i.e., site grading), a combination of scrapers, dozers, graders, loaders, and compactors could be in use concurrently. As a result, average noise levels from combined equipment operations could be substantial at nearby residences. Using the RCNM, the combined average noise level from the equipment types utilized during site grading activities was computed to be approximately 69 dBA L_{eq} at the nearest residences. Because construction activities would be spread out and not concentrated at the nearest position to existing residences (50 feet), actual average construction noise levels at those residences are expected to be below 69 dBA L_{eq}. Nonetheless, estimated average noise levels during construction could still substantially exceed baseline ambient noise levels at nearby residences to the north.

Although the predicted average noise level of 69 dBA includes a 15 dB offset to account for the combination of vegetation and topography between the proposed residential construction area and the nearest residences, the area of the proposed recreational and open-space construction is fairly flat and elevated relative to the neighboring residences. As a result, topographic shielding at the nearest residences during site grading activities occurring farther south from the northern project site boundary would be substantially greater than 15 dBA. In addition, construction activities for the recreational and open space component would be spread out and not concentrated at the nearest

positions to existing residences (approximately 50 feet from recreational component construction). Therefore, it is likely that actual average construction noise levels would frequently be less than 65 dBA L_{eq} at those residences.

As indicated in Table 3.11-8, existing average daytime noise levels at the residences to the north of the recreation area (represented by noise monitoring sites LT-3 and LT-4), typically ranged from 49 to 50 dBA L_{eq}, with an overall daytime average of 49 dBA L_{eq} (after omitting the anomalous 61 dBA L_{eq} data point from measurement site 3 on April 17, 2023). As such, average noise levels during worst-case project construction activities are predicted to be approximately 15 dBA above measured baseline average noise levels in the residential neighborhood. Because construction operations would typically be broadband in frequency content, similar to the background noise environment, the perceived increases in average noise levels at the nearest residences is not anticipated to be dramatic despite the potential 15+ dBA increase during worst case noise-generating construction activities.

Even though project construction activities are not predicted to exceed the San Bruno Municipal Code standards applicable to project construction, because construction could result in short-term increases in average ambient noise levels exceeding 10 dBA (i.e., a perceived doubling of loudness) at nearby residences during worst-case construction noise-generating activities, this impact is considered **potentially significant.**

As described previously, mitigation measures NOI-1a and NOI-1b would be required to reduce construction noise impacts associated with the project. Mitigation measures NOI-1a and NOI-1b require implementation of several measures to reduce noise as experienced at nearby sensitive uses during construction. The mitigation measures are anticipated to reduce the increase in average noise levels at the nearest residences during project construction to less than 10 dBA, which is below the significance criteria. As a result, this impact would be **less than significant with mitigation**.

Construction Haul Truck Noise

According to the air quality analysis for the project, approximately 92 daily heavy truck trips would occur on a worst-case day (during the demolition phase of project construction) for the removal of material from the site. The increase in traffic noise levels along the local roadway network which would result from this truck traffic was computed using the FHWA Traffic Noise Prediction Model (RD-77-108). The results of that analysis indicate that, along the roadways that would be utilized by the heavy trucks removing demolition debris from the site (Courtland Drive, Cunningham Way, and Whitman Way), the traffic noise level increases would range from 0.8 to 2.6 dBA L_{dn}. Because this range of traffic noise level increase is below the 3 to 5 dBA threshold for a finding of a significant noise increase, noise impacts related to construction-generated heavy truck traffic are considered **less than significant** for the proposed project and project variant.

Operations

Mechanical Equipment Noise

No operational mechanical equipment is proposed for use at the recreational component of the project. Regarding the residential project component, a common noise source associated with residential developments is air conditioning condenser units. Although the precise locations of

project heating, venting, and air conditioning (HVAC) equipment are not known at this time, the 155 HVAC units (one per residence) would likely be ground-mounted adjacent to the individual home served by that specific HVAC unit.

Typical single-family residential dwelling condenser units generate sound power levels of approximately 71–76 dBA (Appendix F, *Noise Technical Report*). Noise generated by residential condenser units is frequently shielded from neighboring residential units by privacy fences or residential structures. Given a distance of 150 feet from the nearest proposed residences to the nearest existing residences in the project vicinity, attenuation by distance alone would reduce condenser noise levels to 27 to 32 dBA at those nearest residences. With multiple condenser units operating concurrently, the distance to the more distant condensers would be considerably greater than 150 feet and the aforementioned shielding would occur. After consideration of the effects of shielding by topography, privacy fences, and other residential structures, as well as absorption by intervening vegetation, condenser noise levels resulting from the project are not expected to exceed 35 dBA at existing residences, even during periods when multiple condenser units are operating. The residential component for the proposed project and project variant would be the same Because this level is both below City of San Bruno noise standards and below measured baseline ambient noise levels at the existing residences surrounding the project site, this impact is considered **less than significant** for the proposed project and project variant.

Traffic Noise

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to quantify increases in existing traffic noise levels at the existing sensitive land uses nearest to the project area roadway network. The model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop L_{dn} values from L_{eq} values.

Traffic data in the form of peak hour intersection turning movements were provided by the project transportation consultant. Those data were converted to ADT segment volumes by multiplying the average of the AM and PM movements by a factor of 10. Other inputs were obtained from BAC observations and noise measurement data (BAC 2023).

The Existing and Existing Plus Project Traffic noise levels at the distances representing the nearest sensitive land uses to the project area roadways are summarized in Table 3.11-12. Table 3.11-12 also shows the thresholds for determination of a significant traffic noise increase, whether the roadway segment contains sensitive uses, and whether significant noise impacts are identified for each segment.

Table 3.11-12 indicates that project-generated traffic noise level increases would not result in significant noise increases at existing sensitive receptors located along the project area roadway network. Traffic generation would be the same under the proposed project and project variant. As a result, traffic noise impacts on existing noise-sensitive land uses would be **less than significant** for the proposed project and project variant.

Table 3.11-12. Predicted Traffic Noise Level Increases at Existing Sensitive Receptors – Existing vs. Existing Plus Project Conditions

#	Roadway	Segment Description	Predicted L_{dn}, dBA			Significance Threshold[a]	Threshold Exceeded?	Sensitive Receptors Present?[b]	Significant Impact Identified?[c]
			Existing	Existing + Project	Increase				
1	Skyline Blvd	North of San Bruno Ave W	66.4	66.4	0.0	1.5	No	Yes	No
2	Skyline Blvd	South of San Bruno Ave W	65.7	65.7	0.0	1.5	No	Yes	No
3	San Bruno Ave W	East of Skyline Blvd	64.6	64.7	0.1	3.0	No	Yes	No
4	San Bruno Ave	West of Interstate 280	65.3	65.5	0.2	1.5	No	Yes	No
5	San Bruno Ave	East of Interstate 280	67.8	67.8	0.0	1.5	No	Yes	No
6	Cunningham Way	South of Jenevin Ave	62.2	62.3	0.1	3.0	No	Yes	No
7	Jenevein Ave	East of Cunningham Way	63.4	63.5	0.1	3.0	No	Yes	No
8	Jenevein Ave	West of Cunningham Way	62.1	62.4	0.3	3.0	No	Yes	No
9	Courtland Dr	Whitman Way to Rosewood Dr	58.8	60.7	1.9	5.0	No	Yes	No
10	Whitman Way	East of Courtland Dr	59.7	60.3	0.6	5.0	No	Yes	No
11	Whitman Way	West of Courtland Dr	58.4	59.4	1.0	5.0	No	Yes	No
12	Courtland Dr	South of Rosewood Dr	56.6	59.0	2.4	5.0	No	Yes	No
13	Rosewood Dr	West of Courtland Dr	50.6	50.7	0.1	5.0	No	Yes	No
14	Madison Ave	North of Piedmont Ave	44.4	45.1	0.7	5.0	No	Yes	No
15	Courtland Dr	East of Madison Ave	49.0	53.1	4.1	5.0	No	Yes	No
16	Piedmont Ave	Madison Ave to Crestmoor Dr	49.1	52.3	3.2	5.0	No	Yes	No
17	Crestmoor Dr	North of Piedmont Ave	53.9	54.9	1.0	5.0	No	Yes	No
18	Crestmoor Dr	South of Piedmont Ave	56.5	56.8	0.3	5.0	No	Yes	No

[a] Significance threshold derived from Table 3.11-6.
[b] Sensitive receptors were considered to be residences of all densities, schools, and transient lodging facilities.
[c] A significant impact is identified only along segments where the project-related traffic noise level increase would exceed the significance threshold AND where sensitive receptors are present along the roadway segment.
Source: FHWA-RD-77-108 with inputs from project traffic impact study. Appendix F, *Noise Technical Report*, contains FHWA model inputs.

Playing Fields Noise

The City would also construct improvements within the dedicated open space area in the northern area of the project site, including a sports field with permanent nighttime lighting fixtures and associated parking west of Courtland Drive. The open hours for the recreational field would be 5:00 am to 10:00 p.m. daily; however, actual hours of use of the recreation facility for organized activities and lighting would be subject to a rental application. The field would be striped to allow reconfiguration of fields to accommodate various sizes of fields.

The configuration of the fields has not been finalized. However, the conceptual site design shown in Figure 2-5 of this EIR would allow for a maximum of 6 soccer playing fields in use at any one time. Another option would include striping for two little league fields and five soccer fields, allowing for a maximum of two little league baseball games or five soccer games to occur at one time. The playing fields and other recreational uses would be the same under the variant as with the proposed project, except that the graded area within the dedicated open space that could be improved by the City would be about 0.75 acre smaller than with the proposed project.

Table 3.11-9 data indicate that maximum and median noise levels at the reference noise measurement distance of 75 feet were approximately 70 dBA L_{max} and 55 dBA L_{50}, respectively, during the playing of two concurrent soccer games at the project site. Between the two games approximately 50 spectators were present. Noise generated during the games was primarily caused by spectators cheering for the players and the coaches instructing their players. The players themselves did not generate appreciable noise.

The current field configuration allows for multiple soccer games to be played concurrently, as would the proposed playing field configuration. Assuming up to six games occurring concurrently, the increase in noise versus that generated during the two games that were played concurrently during the noise survey computes to an approximate 5 dBA increase.[1] However, the noise generation would be spread throughout the playing field areas, not concentrated at a distance of 75 feet from the nearest residences. As a result, maximum playing field noise levels at the nearest residences were computed from the nearest spectator location, which was scaled to be approximately 75 feet. Average/median playing field noise levels at the nearest residences were computed from the center of the playing field site, or approximately 200 feet from the nearest residences.

In addition to the effects of distance on the predicted playing field noise levels, intervening topography would also have a substantial impact on the transmission of sound between the playing fields and nearby residences. This is because the nearest residences to the north of the playing fields are at substantially lower elevations than the playing field site. From the ambient noise level data collected at monitoring site LT-4 during periods when soccer games were occurring at the project site, this shielding was computed to reduce playing field noise by approximately 15 dBA.

Based on the effects of topographic shielding, the assumptions regarding the locations where the maximum and median noise generation would originate, and the cited reference playing field noise level data, maximum and median playing field noise levels were computed at the nearest residences. The predicted maximum playing field noise levels at the nearest residences would be approximately

[1] The 5 dBA increase is computed as follows: dBA increase = 10 * Log (number of future games/number of games occurring during monitoring period) = 10 * Log (6 games/2 games) = 5 dBA.

60 dBA L_{max} and the predicted median noise levels at the nearest residences would be approximately 36 dBA L_{50}.

As indicated in Table 3.11-8, baseline median noise levels at long-term ambient monitoring site LT-4 were 47 dBA during daytime hours. Adding the predicted 36 dBA L_{50} value to the existing 47 dBA L_{50} value yields a worst-case median noise level of 47 dBA, which represents a negligible change in noise levels over existing ambient conditions at the nearest residences. This level of increase would be satisfactory relative to San Bruno Municipal Code Section 6.16.050 and relative to the more conservative FICON criteria shown in Table 3.11-6. As a result, noise generated by activities on the proposed playing fields is not expected to exceed City of San Bruno noise standards or substantially exceed existing ambient noise levels at the nearest residences to the proposed playing fields. The recreation component would be the same under the proposed project and project variant. Therefore, noise impacts from playing field activities would be considered **less than significant** under the proposed project and project variant.

Impact NOI-2: Would the project generate excessive groundborne vibration or groundborne noise levels? (Less than Significant)

During project construction for both the residential component and the recreational and open space component under the proposed project and project variant, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest identified existing structures (newer engineered residences and the church building to the east that are not highly susceptible to damage by vibration) are approximately 175 feet from proposed residential construction, and likely at least 50 feet from any playing field construction. Based on reference vibration level for heavy equipment of 0.035 to 0.089 inch/second at a reference distance of 25 feet, vibration levels at the nearest residences located approximately 50 feet or more from project construction would be approximately 0.04 inch/second. Because this level is orders of magnitude below the 0.5 inch/second threshold for damage to structures or annoyance, vibration impacts related to both annoyance and structural damage for the proposed project and project variant would be **less than significant**.

Impact NOI-3: Would the project place of project-related activities in the vicinity of a private airstrip or an airport land use plan or within 2 miles of a public airport or public use airport, resulting in exposure of people residing or working in the project area to excessive noise levels? (No Impact)

The closest airport to the project site is SFO, which is approximately 1.5 miles to the east. However, the project site is outside the 65 dBA noise contour (and all estimated noise contours) for this airport according to the 2012 *Comprehensive Airport Land Use Compatibility Plan (ALUCP) for the Environs of San Francisco International Airport*. Land uses proposed under the project include residential and recreational land uses. According to Table IV-1*, Noise/Land Use Compatibility Criteria*, of the ALUCP document, outdoor sports arenas and spectator sports recreational land uses are considered compatible with noise levels up to 75 dBA. Residential land uses are designated as compatible with noise levels of up to 65 dBA. Because the project site is outside of all airport contours according to the ALUCP (as shown in Appendix F, *Noise Technical Report*, Figure 6), the project would not conflict with the land use restrictions in the ALUCP. In addition, there are no private airstrips in the vicinity of the project. The proposed project and project variant would be in

the same location. Therefore, there would be **no impact** related to aircraft noise from private airstrips or public airports under either the proposed project or project variant.

3.12 Population and Housing

This section evaluates the project's potential environmental impacts on population and housing. It first describes the existing housing and population patterns in project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.12.1 Existing Conditions

Regulatory Setting

State

Sustainable Communities Strategy and Senate Bill 375

Senate Bill (SB) 375, adopted in 2008, requires preparation of a Sustainable Communities Strategy (SCS) as part of the Regional Transportation Plan (RTP). Plan Bay Area 2050, the SCS for the region, was jointly approved in October 2021 by the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG).[1] The plan represents a transportation and land use/housing strategy for how the San Francisco Bay Area (Bay Area) will address its transportation mobility and accessibility needs, land development, and greenhouse gas emissions reduction requirements through 2050.

The Plan Bay Area 2050 *Forecasting and Modeling Report* provides a series of statistical compendia on demographic, economic, and land use changes in coming decades (MTC and ABAG 2021b). The current version covers the period between 2015 and 2050. The projections illustrate how the region will accommodate growth if local jurisdictions adopt a set of policies consistent with the vision of Plan Bay Area 2050. Growth is distributed within the region among counties, cities, and Priority Development Areas (PDAs), which are designated areas that are expected to accommodate more than two-thirds of all regional growth by 2050. The project site is not within a designated PDA.

Housing Element Law

Housing Element law requires local jurisdictions to plan for and allow the construction of a share of the region's projected housing needs. This share is called the Regional Housing Needs Allocation (RHNA). Housing needs for each region in the state are determined by the State Department of Housing and Community Development and submitted to Councils of Government for allocation to local jurisdictions. ABAG is ultimately responsible for determining the share of regional housing needs to be met by each city in the Bay Area. State housing law has established four housing categories. The categories are based on the region's median income, taking into account households ranging in size from one to six people. These four affordability categories are used by ABAG in allocating regional housing needs.

[1] MTC is the government agency responsible for regional transportation planning, financing, and coordinating transportation services in the nine-county San Francisco Bay Area.

- Very Low: 0 to 50 percent of the area's median income.
- Low: 50 to 80 percent of the area's median income.
- Moderate: 80 to 120 percent of the area's median income.
- Above Moderate: greater than 120 percent of county median family income.

In the Bay Area, the SCS and ABAG's RHNA methodology are mutually reinforcing and were developed together to meet the overlapping objectives of SB 375 and the Housing Element law. These objectives include increasing the supply, diversity, and affordability of housing; promoting infill development and a more efficient land use pattern; promoting an improved intraregional relationship between jobs and housing; protecting environmental resources; and promoting socioeconomic equity. SB 375 requires that the RHNA be consistent with the SCS and establishes an 8-year cycle for the RHNA. The RHNA has been incorporated into Plan Bay Area 2050 (MTC and ABAG 2021a).

Currently, the RHNA identifies allocated housing units for the 2023 to 2031 period (Table 3.12-1). ABAG identified 3,165 units (defined by income category) as the City's fair share of the regional housing need for the 2023 to 2031 period (Table 3.12-1) (ABAG 2022).

Table 3.12-1. ABAG Regional Housing Need Allocation for the City of San Bruno and County of San Mateo 2023–2031 (Units)

Income Level	City Need	County Need	Regional Need
Very Low	704	12,196	114,442
Low	405	7,023	65,892
Moderate	573	7,937	72,712
Subtotal of Affordable Units	*1,683*	*27,156*	*253,046*
Above Moderate[a]	1,483	20,531	188,130
Total	**3,165**	**47,687**	**441,176**

[a] Above Moderate = households with incomes greater than 120% of county median family income.
Source: ABAG 2022.

Local

City of San Bruno General Plan and Housing Element

The San Bruno General Plan, adopted in 2009 and amended in 2013 in conjunction with the San Bruno Transit Corridors Plan, includes goals and policies related to population and housing (City of San Bruno 2009). All California cities and counties are required to have a Housing Element included in their general plans that establishes housing objectives, policies, and programs in response to community housing conditions and needs. San Bruno's Housing Element, adopted January 24, 2023, focuses on the 2023 to 2031 planning period, consistent with the City's Regional Housing Needs Allocation as assigned to the City by ABAG and state law requirements. The policies within the Housing Element are an expression of the statewide housing goal of "a suitable living environment for every Californian," as well as a reflection of the unique housing needs of the San Bruno community. The City sent the adopted San Bruno Housing Element to the California Department of Housing and Community Development (HCD) on January 31, 2023. HCD provided a letter to the City on March 29, 2023, that outlines additional revisions that are needed to comply with State Housing

Element Law. As of the writing of this Draft EIR, HCD has not yet issued a letter finding that the City's adopted Housing Element is in substantial compliance. The Land Use & Urban Design Element includes policies applicable to housing, such as those that promote infill and revitalization, coordinate planning and development with surrounding cities and agencies, and ensure that new development is sensitive to existing uses. It also contains policies aimed at providing adequate housing and maintaining a job-housing balance in San Bruno.

The project's consistency with applicable General Plan policies is evaluated in Section 3.10, *Land Use*, of this environmental impact report (EIR).

City of San Bruno Affordable Housing Program

City of San Bruno Municipal Code Section 12.230 presents the City's Affordable Housing Program. The Affordable Housing Program includes requirements and regulations that apply to new residential ownership or rental developments of five units or more, and all new nonresidential developments throughout the City. Section 12.230.030 states that all new residential development projects of five or more units shall include at least 15 percent of the total units as affordable housing units restricted for occupancy by very low-, low-, and moderate-income households.

Environmental Setting

Regional Setting

Population

According to recent California Department of Finance data, San Bruno has a population of 41,052 (as of January 1, 2023), while San Mateo County has a population of 737,644 (California Department of Finance 2023). In addition, the city has an average household size of 2.61 persons per household, similar to the 2.67 persons per household average for the county (California Department of Finance 2023). ABAG's Projections 2040 was produced in support of the previous version of the SCS, rather than Plan Bay Area 2050, but was used for the analysis herein because it contains city-specific data. As shown in Table 3.12-2, according to ABAG's Projections 2040, San Bruno's population will increase by approximately 9,915, from 41,455 in 2020 to 51,370 in 2040, while San Mateo County's population will increase by approximately 117,250, from 786,875 in 2020 to 904,125 in 2040 (MTC and ABAG 2018). The Bay Area population is also expected to grow, increasing by approximately 1,692,840 (MTC and ABAG 2018).[2]

Housing

According to recent California Department of Finance data, San Bruno has 16,732 total housing units and a 4.6 percent vacancy rate (as of January 1, 2023) (California Department of Finance 2023). Approximately 56 percent (9,364) of the units are single detached units, approximately 6 percent (939) are structures with two to four units, and approximately 34 percent (5,766) are structures with five or more units (California Department of Finance 2023). For 2023, sources have reported a

[2] As discussed in the *Sustainable Communities Strategy and Senate Bill 375* section above, ABAG's Projections 2040 is a series of statistical compendia on demographic, economic, and land use changes in the coming decades. These forecasts are created to help local governments anticipate and prepare for changes and are not based on actual counts. California Department of Finance population estimates are based on current counts from a variety of sources, including drivers' licenses, birth and death certificates, public school enrollment numbers, and other sources. For these reasons, differences may appear between the population numbers for the two data sets.

San Bruno median home value of $1,242,227 (Zillow 2023). ABAG's Projections 2040 for housing are provided in Table 3.12-2. There are no existing housing units on the project site currently.

Table 3.12-2. City of San Bruno and Bay Area Population and Household Projections, 2020–2040

	2020	2030	2040	Growth, 2020–2040
Population[a]				
City of San Bruno	41,455	43,835	51,370	9,915 (24%)
San Mateo County	786,875	842,060	904,125	117,250 (15%)
Bay Area	7,758,535	8,509,245	9,451,375	1,692,840 (22%)
Households				
City of San Bruno	14,890	15,570	17,935	3,045 (20%)
San Mateo County	284,260	302,520	317,965	33,705 (12%)
Bay Area	2,881,965	3,142,020	3,426,705	544,740 (19%)

[a] Does not include the population in group quarters. The U.S. Census Bureau classifies all people not living in housing units (i.e., houses, apartments, mobile homes, rented rooms) as living in group quarters. Institutional group quarters include correctional facilities, nursing homes, and mental hospitals. Noninstitutional group quarters include college dormitories, military barracks, group homes, missions, and shelters.
Source: MTC and ABAG 2018.

Employment

As shown in Table 3.12-3, jobs in San Bruno and San Mateo County are projected to increase between 2020 and 2040. A jobs-to-employed-residents ratio is used to evaluate the match between jobs and residents in a community. When the ratio is greater than 1.0, it indicates that the community is providing more jobs than it has residents to fill them; a jobs-to-employed-residents ratio of less than 1.0 indicates that a community has fewer jobs than employable residents. ABAG predicts that San Bruno will maintain a ratio of 0.6 from 2020 to 2040, while San Mateo County will maintain a jobs-to-employed-residents ratio of 1.0.

Table 3.12-3. City of San Bruno and Bay Area Employment Projections, 2020–2040

	2020	2030	2040
San Bruno			
Population	41,455	43,835	51,370
Jobs	14,645	14,905	14,780
Employed Residents	22,310	22,640	25,335
Jobs-to-Employed-Residents Ratio	0.7	0.7	0.6
San Mateo County			
Population	786,875	842,060	904,125
Jobs	399,275	423,005	472,045
Employed Residents	415,275	433,655	446,040
Jobs-to-Employed-Residents Ratio	1.0	1.0	1.1
Bay Area			
Population	7,758,535	8,509,245	9,451,375
Jobs	4,136,195	4,405,120	4,698,375
Employed Residents	4,147,005	4,397,865	4,663,895
Jobs-to-Employed-Residents Ratio	1.0	1.0	1.0

Source: MTC and ABAG 2018.

3.12.2 Environmental Impacts

Methods for Analysis

This analysis considers whether substantial population and household growth would occur with implementation of the project and whether this growth is within forecasts for the city and/or can be considered substantial with respect to remaining growth potential in the city. This section uses ABAG's projections to analyze the project's impacts given the age of the City's General Plan and the use of Plan Bay Area 2050 data to inform the RHNA.

Substantial population growth is considered an increase in population that is unplanned, without consideration of, or planning for, infrastructure services and housing to support new residents, employees, and visitors. In general, a project that induces population growth is not viewed as having a significant impact on the environment unless the physical changes that would be needed to accommodate project-related population growth would have adverse impacts on the environment. Project-related residential growth would result in direct physical environmental changes. Impacts of residential growth are analyzed and disclosed in the various environmental topic sections in this EIR.

An indirect environmental impact is a change to the physical environment that is not immediately related to a proposed project. Specifically, indirect project-related population growth includes the ways in which a proposed project could foster economic or population growth in other locations or induce the construction of additional housing. Projects that would remove obstacles to population growth (e.g., a major expansion of a wastewater treatment plant or an extension of roadways into a previously unserved area) might, for example, allow for development to occur in an area that was not previously considered feasible for development because of infrastructure limitations. This type of development pattern typically occurs in suburban or rural areas adjacent to undeveloped land and is not generally applicable to a site that is in a developed urban environment and already served by infrastructure.

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. However, increased use of the field would not increase population growth or result in impacts to housing. Therefore, the potential for increased use, which is currently undefinable, is not analyzed further.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Impact POP-1: Creation of substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).
- Impact POP-2: Displacement of a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere.

Impacts

Impact POP-1: Would the project create substantial unplanned population growth either directly or indirectly? (Less than Significant)

The project would result in a significant impact related to population and housing growth if it would lead to substantial unplanned growth, either directly or indirectly. A project can introduce population and housing growth both directly (i.e., through the construction of new housing) and indirectly (i.e., through employee-generated demand).

Construction

As discussed in Chapter 2, *Project Description*, construction could last for a total of approximately 21 months. The number of construction workers on site would vary according to the stage of construction. It is anticipated that construction employees associated with the project who are not already living in the city or nearby would commute from their residences elsewhere in the Bay Area rather than permanently relocate to San Bruno, as is typical for employees in various construction trades. Once the construction phases are complete, construction workers typically seek employment at other job sites in the region that require their particular skills rather than remain in the area. Thus, construction of the project would not generate substantial unplanned population growth in the city or region. The project variant would require the same number of workers as the proposed project. Construction-related population and housing impacts would be **less than significant.**

Operation

The residential portion of the project would generate direct population and housing growth but would not involve the introduction of new businesses that would indirectly generate population growth. As shown in Table 3.12-4, the project is anticipated to generate 388 onsite residents in the 155 new housing units. The recreation field would continue to host similar activities as the site currently hosts and is not expected to attract additional residents to the city.

Table 3.12-4. Direct Resident Generation

	Units	Generation Rate	Projected Residents
Onsite households	155	2.5 persons/household[a]	388 residents

[a] California Department of Finance 2023.

According to ABAG, San Bruno is expected to experience an approximate 24 percent growth increase between the planning years 2020 and 2040 (MTC and ABAG 2018). The population upon build-out of the proposed project would account for approximately 4 percent of the projected growth for San Bruno.

The sites inventory in San Bruno's Housing Element identifies areas in the city suitable for residential development. The sites inventory does not indicate that San Bruno must develop housing on those sites to meet the city's RHNA, or foreclose development on other sites. The Crestmoor High School site is mentioned in the City's Housing Element as an example of a housing opportunity on a former school site, but is not included in the sites inventory. The Housing Element also alludes to work with a private developer to construct housing on the former Crestmoor High School site (City of San Bruno 2023).

The proposed project would induce population growth by creating housing opportunities in excess of what is currently available. However, this increase would be substantially lower than the level of development currently projected by ABAG for the region and anticipated in the Housing Element adopted in 2023. In addition, the project would accommodate all new San Bruno residents generated by the proposed project and would not generate additional housing demand beyond the residential uses. As such, construction of the proposed 155 residential units would induce population growth, but not growth in excess of that anticipated in local plans. The project would not generate substantial unplanned population growth in the city or region. The variant would have the same number of residences and the same level of recreational uses and would therefore have the same impact as the proposed project. Population and housing impacts would be **less than significant.**

Additionally, the project includes 24 onsite below market rate (BMR) homes (8 at low-income level and 16 at moderate-income level, 15 percent of the total of 155 units) spread throughout the two neighborhoods, with 12 BMR homes in each neighborhood. Thus, the proposed project would meet the City's Affordable Housing Program requirements.

Impact POP-2: Would the project displace a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere? (No Impact)

The proposed project site is an unoccupied former high school campus without existing housing. Therefore, implementation of the project and project variant would not displace existing housing units or people. The project and project variant would result in **no impact** related to the displacement of housing.

3.13 Public Services

This section evaluates the project's potential environmental impacts on public services. It first describes the existing public services in the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.13.1 Fire Protection Services

Regulatory Setting

National Standards

Uniform Fire Code

The National Fire Protection Association publishes the Uniform Fire Code, which provides standards for fire protection. The nationally recognized standards require that fire departments "have the capability to deploy an initial full alarm assignment within an eight-minute response time to 90 percent of the incidents."

State

California Fire Code

The California Fire Code incorporates, by adoption, the International Fire Code of the International Code Council, with California amendments. This is the official fire code for the state and all political subdivisions. It is located in Part 9 of Title 24 of the California Code of Regulations. The California Fire Code is revised and published every 3 years by the California Building Standards Commission; the currently operable code is the 2022 California Fire Code, which has been adopted by the City of San Bruno.

Local

San Bruno General Plan

The *San Bruno General Plan* (General Plan) (City of San Bruno 2009) outlines various goals, policies, and implementing programs relevant to fire protection services in the Land Use and Urban Design, Health and Safety, and Public Facilities and Services Elements. Policies relevant to the project address the adequate provision of public safety staffing, facilities, and building features such as fire flow and sprinklers. The project's consistency with applicable General Plan policies is evaluated in Section 3.10, *Land Use and Planning*, of this Draft EIR.

Environmental Setting

City of San Bruno Fire Department

The San Bruno Fire Department provides fire suppression and emergency medical service in the city, including the project site.

Staffing

Fire protection in the City of San Bruno is provided by the San Bruno Fire Department, which has 35 full-time fire fighters and 10 trained "Paid Call Reserves." Fire department administration consists of a fire chief, a fire marshal, and three shift battalion chiefs. All fire department firefighters are trained at the First Responder Operator level. As of 2020, the City of San Bruno has a population of 41,455 (MTC and ABAG 2018). The Association of Bay Area Governments (ABAG) estimates that San Bruno had 14,645 jobs in 2020. The total number of employed residents in San Bruno is 22,310 as of 2020 (MTC and ABAG 2018). The fire department considers a project's service population to include the total residential population and half of the total employment population. Thus, the fire department's existing service population is estimated to be 48,778[1] persons, or approximately 1,394 persons per firefighter (based on 35 sworn officers).[2]

Facilities

The fire department operates two fire stations in the City of San Bruno. Station No. 51 is on the south side of the City Hall complex at 555 El Camino Real, approximately 1.5 miles west of the project site, and has the primary responsibility for the area east of I-280. Station No. 52 is near the intersection of Sneath Lane and Earl Avenue at 1999 Earl Avenue, approximately 2 miles north of the project site. Each station in the city is equipped with a 1,500-gallons-per-minute pumper (i.e., fire engine). The project site is served by Station No. 52. Both Station 51 on El Camino Real and 52 near Skyline Boulevard are outdated. Built in the mid-1950s, the stations lack many of the modern amenities considered necessary for fire service delivery and compliance with the Americans with Disabilities Act (ADA). The long-term solution is to relocate Station 52 to a Caltrans-owned lot on the corner of Glenview Drive and West San Bruno Avenue and reconstruct Station 51 at the same location (Mazzoni 2022).

The fire department is also part of a Joint Powers Authority (JPA) as the San Mateo Consolidated Fire Department between the 20 incorporated cities in San Mateo County along with the county itself. The JPA requires that the closest available paramedic engine company respond to calls for emergency medical service, and the closest available engine and truck company respond to fire calls. When an event calls for specialized equipment or more resources, the apparatuses from either station will respond anywhere in the city. In addition, a full assignment response such as a fire, fire alarm, or other type of call, which would necessitate a large response, requires three engines; therefore, an additional engine would need to come from a neighboring jurisdiction in an event requiring a full assignment response. The two stations closest to the project site, which are outside of San Bruno, include Fire Station 64 in South San Francisco north of the project site and Central County Fire Station 37 in Millbrae, southeast of the project site. For hazardous materials (hazmat)

[1] Total population (41,455) + half of people working in San Bruno (14,645/2 = 7,322.5) = 48,777.5, rounded to 48,778.

[2] 48,778/35 = 1,393.65, rounded to 1,394.

responses, the nearest hazmat unit within the JPA is located at Station 14 at 911 Granada Street in the City of Belmont.

Response Times

Fire departments respond to a variety of life-threatening and non-life-threatening calls, including emergency calls for service and other fire-related calls. As part of the JPA, the fire department is expected to maintain a response time of 6 minutes and 59 seconds for priority medical calls (i.e., emergencies such a stroke, heart attacks, and severe traumatic accidents that require patients to be seen and treated in a very short time). For non-emergency calls, the response time requirement is 14 minutes and 59 seconds (City of San Bruno 2021). The fire department's stated goal is to get an emergency vehicle to the incident within 4 minutes in the city's 5.5-mile radius. However, the department is averaging 5-minute response times (Mazzoni 2022).

Budget and Funding

The City's comprehensive Development Impact Fee (DIF) Ordinance requires all residential and commercial developers to pay a one-time fee charged at the issuance of building permits for new construction in the City (City of San Bruno 2019: A5). This fee is collected and used to improve and expand public capital facilities and infrastructure throughout the City needed to serve new growth. The Master Fee Schedule of July 2023 assigns a DIF of $31,590.71 per single-family residential unit to generate funds for capital facilities and infrastructure improvements (City of San Bruno 2023). A portion of the DIF is used for public safety, including police and fire capital facilities and infrastructure, including equipment (e.g., vehicles). Specifically, $1,521 per residential unit is allocated for public safety. The DIF is not a source of funding for ongoing personnel needs.

A general increase in property tax revenue will be received annually by the city for the developed homes. This funding will increase the general fund revenue, which may be used for fire department costs, including staffing, depending on how the City Council chooses to allocate any additional funding.

3.13.2 Police Protection Services

Regulatory Setting

City of San Bruno

The General Plan outlines various goals, policies, and implementing programs relevant to police protection services (City of San Bruno 2009). The policies relevant to the project address the need to mitigate the impacts of new development on public services. The project's consistency with applicable General Plan policies is evaluated in Section 3.10, *Land Use and Planning,* of this Draft EIR.

Environmental Setting

City of San Bruno Police Department

The San Bruno Police Department is a full-service municipal police agency for a city of approximately 42,000 people. The department provides a wide range of law enforcement services to the community and responds to over 32,000 calls for service each year. The police facility is a 23,000-square-foot building located at 1177 Huntington Avenue.

Staffing

The project site would be served by the San Bruno Police Station at 1177 Huntington Avenue, which is approximately 2.7 miles northeast of the project site. The department currently employs 50 sworn officers, and over 60 employees. The police department provides law enforcement services 24 hours a day, 7 days a week. Police department services include highly visible patrols, systematic gathering and documentation of intelligence information, and the enforcement of laws and regulations throughout the city. In addition, the police department belongs to a mutual aid agreement with neighboring jurisdictions and partner agencies.

Response Times and Performance

The police department does not have a standard for the ratio of officers relative to the population; rather, it bases its staffing levels on the number of service calls and crime incidents. The top five most frequently reported crimes in 2020 were theft, automobile burglaries, assault, burglaries (nonvehicle), and identity theft. The police department's response time standard is 5 minutes or less for high-priority calls. For instance, there is a higher priority placed on the safety of persons and the public over damage or destruction to public or private property. A call is considered an emergency when there is an immediate or potential threat to life or serious property damage. Emergency calls are to be dispatched immediately.

Budget and Funding

On February 26, 2019, the City Council adopted San Bruno Municipal Code Chapter 12.260, Development Impact Fees, which imposes fees upon development projects to fully or partially offset the costs of public facilities and infrastructure that is needed to serve new demand created by development projects (City of San Bruno 2023). The Ordinance requires all residential and commercial developers to pay a one-time DIF at the issuance of building permits for new construction in the city. This fee is collected and used to improve and expand public capital facilities and infrastructure throughout the city needed to serve new residential and commercial growth. The Master Fee Schedule of July 2023 assigns an impact fee of $31,590.71 per single-family residential unit (City of San Bruno 2023). A portion of the DIF, depending on whether the new construction is nonresidential or residential, would be used for public safety, including police and fire capital facilities and infrastructure, including equipment (e.g., vehicles). Specifically, $1,521 per residential unit is allocated for public safety. The DIF is not a source of funding for ongoing personnel needs.

A general increase in property tax revenue will be received annually by the city for the developed homes. This funding will increase general fund revenue, which may be used for police expenses, including staffing, depending on how the City Council chooses to allocate any additional funding.

3.13.3 Schools

Regulatory Setting

State

Senate Bill 50

Senate Bill (SB) 50 (funded by bonds sold under Proposition 1A, approved in 1998) limits the power of cities and counties to require mitigation of school facilities impacts as a condition of approving

new development and provides instead for a standardized developer fee. SB 50 generally provides for a 50/50 state and local school facilities funding match. SB 50 also provides for three levels of statutory impact fees. The application level depends on whether state funding is available, whether the school district is eligible for state funding, and whether the school district meets certain additional criteria involving bonding capacity, year-round school, and the percentage of moveable classrooms in use.

California Government Code Section 65995(b) and Education Code Section 17620

SB 50 amended the California Government Code Section 65995, which contains limitations on Education Code Section 17620, the statute that authorizes school districts to assess development fees within school district boundaries. Government Code Section 65995(b)(3) requires the maximum square footage assessment for development to be increased every 2 years, according to inflation adjustments. On February 23, 2022, the State Allocation Board approved increasing the allowable amount of statutory school facilities fees (Level I School Fees) to $4.79 per square foot of assessable space for residential development of 500 square feet or more, and to $0.78 per square foot of chargeable covered and enclosed space for commercial/industrial development (State Allocation Board 2022).

Mitigation Fee Act (California Government Code 66000–66008)

Enacted as Assembly Bill (AB) 1600, the Mitigation Fee Act requires a local agency establishing, increasing, or imposing an impact fee as a condition of development to identify the purpose of the fee and the use to which the fee is to be put. The agency must also demonstrate a reasonable relationship between the fee and the purpose for which it is charged, and between the fee and the type of development plan on which it is to be levied. The act came into force on January 1, 1989.

Local

City of San Bruno

The San Bruno General Plan outlines various goals, policies, and implementing programs relevant to schools. The policies relevant to the project call for clearly marked crosswalks near neighborhood commercial uses and monitoring of the growth of the school-aged population.

- PFS-F: Provide adequate public safety services for all San Bruno properties—including police protection, fire suppression, emergency medical care, and emergency management.
- PFS-1: Prepare and adopt an Infrastructure In-Lieu Fee Schedule to ensure that adequate improvements are made to the City's public facilities to accommodate new development.
- PFS-3: Require, as part of plan review, identification of needed public service improvement and maintenance costs for those projects that may have a significant impact on existing services.
- PFS-26: Ensure adequate staffing and facilities for the City's Police and Fire departments to achieve desired levels of service, particularly surrounding transit areas and along urban-interface hazard areas.
- PFS-59: In order to prevent anticipated future population growth in San Bruno from burdening existing over-extended library services, City staff will ensure upon individual project review that the developer sets aside contributions or in-lieu fees in general proportion to the burden proposed new residential development would have on the library system, and that those fees

are used to improve public library facilities. The per capita share will be negotiated between the Ad Hoc Library Citizen's Committee, City Staff, and City Council, within 1 year of Plan adoption, and will be applied uniformly (and if necessary, retroactively) across all residential development occupancy permit applications submitted after Plan adoption, until such time as an alternative form of support is provided, or the library facilities are fully upgraded to the requirements as described on p 8-12 Table 8-3 of the General Plan.

The project's consistency with applicable General Plan policies is evaluated in Section 3.10, *Land Use and Planning*, of this Draft EIR.

San Bruno Park School District/San Mateo Union High School District

The project site would be served by two school districts: the San Bruno Park School District (SBPSD) and the San Mateo Union High School District (SMUHSD). Note that SMUHSD currently owns the project site, but the Crestmoor High School is currently vacant. These school districts, whose characteristics are discussed under *Environmental Setting*, are empowered to collect statutory fees from the construction of residential and commercial development to mitigate the impact of new development on school facilities San Bruno Park School District's fees are $4.79 per square foot for residential development while San Mateo Union High School's fees are $1.92 per square foot (SBPSD 2022).

Environmental Setting

San Bruno Park School District

SBPSD was established in 1907 and serves the City of San Bruno with four elementary schools, one preschool, and one intermediate school. Most San Bruno children in kindergarten through eighth grade are served by this district.

Enrollment and Capacity

Table 3.13-1 shows SBPSD's recent past enrollments. SBPSD's total enrollment for the 2021–2022 school year was 2,087 students, an 8 percent decrease from the previous year (Ed Data 2023) and a 20 percent decrease from the 2017–2018 school year. In general, all schools in the SBPSD have experienced a decline in enrollment in recent years. The California Department of Finance projects that overall K-12 enrollment in San Mateo Public Schools will decrease from approximately 86,422 for the 2021–2022 school year to 79,395 by the 2027–2028 school year (State of California 2022). This is consistent with the current trend at SBPSD.

Table 3.13-1. Enrollment for the San Bruno Park Elementary School District

School	2017–2018	2018–2019	2019–2020	2020–2021	2021–2022	2022–2023
TOTAL	2,641	2,505	2,454	2,275	2,087	2,019

Source: California Department of Education 2023.

Budget and Funding

SBPSD's revenue sources include state funding through the Local Control Funding Formula and the Local Control Accountability Plan, property taxes, federal subsidies, mandated block grants, one-time mandated cost reimbursements, the Lottery, After School Education and Safety (ASES) grants, and other sources (San Mateo County Office of Education 2023). SBPSD also collects fees levied on

developers (aka developer fees). The current Developer Fees are $4.79 per square foot for residential development and $0.78 per square foot for commercial development of which the SBPSD collects $2.87 (60 percent of $4.79) per square foot of residential construction and $0.47 (60 percent of $0.78) per square foot of commercial/industrial construction, with the exception of mini storage.

San Mateo Union High School District

SMUHSD operates one alternative high school and six comprehensive high schools throughout San Mateo County. SMUHSD also allows students to attend any of the other comprehensive high schools through an intra-district transfer program. SMUHSD currently owns the site but Crestmoor High School is not currently occupied.

Enrollment and Capacity

Table 3.13-2 shows enrollment at SMUHSD schools from 2018–2023. According to the most recent enrollment figures, SMUHSD's total enrollment for the 2022–2023 school year was 9,487, a 1.7 percent decrease over the previous year and a 0.9 percent decrease from 2018–2019. In general, all the schools in the SMUHSD have experienced a decrease in enrollment in recent years. Capuchino High School, which would serve the project site, has seen an eight percent decrease in enrollment since the 2018–2019 school year. However, the California Department of Finance projects that overall K-12 enrollment in the San Mateo Public School system will decrease from approximately 86,422 for the 2018–2019 school year to 79,395 by the 2027–2028 school year (State of California 2022).

Table 3.13-2. Enrollment for the San Mateo Union High School District

School	2018–2019	2019–2020	2020–2021	2021–2022	2022–2023
TOTAL	9,575	9,885	9,760	9,655	9,487

Source: California Department of Education 2023.

Budget and Funding

SMUHSD's revenue sources include state funding through the Local Control Funding Formula and the Local Control Accountability Plan, property taxes, federal subsidies, along with other sources, The SMUHSD also collects fees levied on developers (aka Developer Fees). The High School District–only portions of School Impact Fees for the cities of Hillsborough, Millbrae, San Bruno and unincorporated Burlingame are $1.92/square foot for residential development and $0.31/square foot for commercial development.

3.13.4 Libraries

The San Bruno Public Library is located at 701 Angus Avenue and is approximately 1.5 miles from the project site. The library is a member of the Peninsula Library System, a consortium of 32 libraries located in San Mateo County. An estimated 60 percent of all San Bruno residents have library cards (City of San Bruno 2009). The library was built in 1955 and expanded in 1960, and a number of mechanical, systems, and structural deficiencies have been identified. As a result, the library is no longer able to adequately meet the needs of its increasingly diverse and numerous patrons (City of San Bruno 2009). The Facility Master Plan prepared for the library in August 2000 identified a shortage of materials and resources available to San Bruno residents The Master Plan

also found that the current library site is too small to support an efficient building and parking configuration. The Ad Hoc Library Citizens Committee recommended two sites for a new two-story, 38,500-square-foot library facility—both within the existing Civic Center complex. The existing library structure could then be used for City Council Chambers, meeting space, and/or offices. However, the Committee also recommended preparation of a parking plan in recognition of the limited parking available within the complex. (City of San Bruno 2009).

3.13.5 Environmental Impacts

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would have the potential to have a significant impact if it would result in any of the following conditions.

A substantial adverse physical impact associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

- Fire protection (Impact PS-1)
- Police protection (Impact PS-2)
- Schools (Impact PS-3)
- Parks
- Other public facilities (e.g., libraries)

Methodology and Approach

Potential impacts on public services are evaluated by the potential for the project to increase demand for public services based on goals established by service providers and comparing the ability of the service provider/public facility to serve the project and accommodate the associated increase in demand. A determination is then made as to whether the existing facilities are capable of meeting the demand of the project and, if not, could the expansion of existing facilities cause an adverse environmental effect. The analysis is based on the projection that, as proposed project would build 155 single family homes, the potential population increase is of approximately 388 new residents.

Refer to Section 3.14, *Recreation*, for a detailed analysis of impacts related to parks and recreational areas. There are adequate park facilities included in the proposed project for the potential increase in population.

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. This could incrementally increase the need for public services like police projection, though it is unlikely due to the nature of the potential increased field use. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and cannot be further analyzed.

3.13.6 Impacts and Mitigation Measures

Impact PS-1. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or response times for fire protection? (Less than Significant)

Construction

Project construction could increase potential exposure to wildfire due to increased ignition risks, as discussed in greater detail in Section 3.18, *Wildfire*, under Impact WF-2, which could increase the need for fire protection services. Sparks originating from construction activities have the potential to ignite vegetation or other materials on or adjacent to the project site, or to spread to the surrounding very high and high Fire Hazard Safety Zones located adjacent to the west of the project site. The project site and vicinity are mostly developed and do not contain extensive amounts of vegetation, flammable vegetation, or other materials that have a high risk of ignition by sparks from construction activities or personnel. Additionally, the project site is flat and does not contain other factors, such as excessive slopes, that are known to exacerbate wildfire risks. As a result, it is not anticipated that construction activities would increase the need for fire protection services. Construction of the project therefore would not require new or altered fire protection facilities.

Operation

The San Bruno Fire Department is currently averaging a 5-minute response time (Mazzoni 2022). This is faster than the JPA standard of 6 minutes and 59 seconds (Superior Court Of California, County of San Mateo 2023). As discussed under *Methodology and Approach*, the proposed project would increase the fire department's service population by 388 persons, which could increase the number of calls for fire protection and emergency service. The number of recreationists on the recreational fields at any given time would overall remain comparable to existing conditions, having no effect on the need for fire protection services. As discussed previously, there are approximately 1,394 persons per firefighter. The addition of the project's 388 residents to the fire department's service population would result in a ratio of 1,406 persons per firefighter, which is an increase in persons per firefighter.[3] While the project would result in a decreased firefighter-to-service-population ratio, the San Bruno Fire Department is part of a JPA as the San Mateo Consolidated Fire Department, which effectively extends fire service delivery capacity in San Mateo County to the entire peninsula, with the ability to pull in other engine companies if necessary. In addition, Station No. 52, which is approximately 1.3 miles northwest of the project site, would provide close access to the project site in the event of a fire or medical emergency. The San Bruno Municipal Code incorporates the 2022 California Fire Code and the 2021 International Fire Code. All new construction under the project would need to be in conformance with these codes, which would require new construction to facilitate emergency access.

While the addition of 388 persons to the fire department's service population could increase the number of calls, this is unlikely to negatively affect response times because response times are already faster than the regional standard, support can be expected through the JPA, and Station No.

[3] 41,455 (San Bruno population 2020) + 388 (resident addition) = 41,843 (the new population) + 14,780 (projected jobs by 2040) / 2 = 49,250 / 35 = 1,406

52 is near the project site. Furthermore, the development of the residential component of the proposed project and variant would increase property taxes collected by the City, which would fund City services like fire protection. Additionally, insofar as the project's DIF would go to public safety efforts, including fire capital facilities and infrastructure, including equipment (e.g., vehicles), those would have already been evaluated and identified as a need by the City. Therefore, payment of the DIF would address the project's share of the improvement and/or expansion of capital facilities and infrastructure, a need that has already been identified by the City. Therefore, no new facilities would be needed.

Based on the above, the project would not result in substantial adverse physical environmental impacts associated with the provision of new or physically altered fire protection facilities in order to maintain acceptable service ratios, response times, or other performance objectives. The project variant would have the same impact as the proposed project because the same number of residents and recreationists could be on site as for the proposed project. As such, impacts on fire protection would be **less than significant**.

Impact PS-2. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection? (Less than Significant)

Construction

While construction materials would be stored on site for the duration of construction, it is typical for contractors to implement security measures such as fencing, lighting, and, in some cases, security guards or cameras. As a result, it is not expected that construction activities would result in a substantial increase in calls for police protection. No new facilities would be needed as a result of construction.

Operation

The population increase resulting from the project would result in an increase in the number of calls for law enforcement services. The police department has an officer-per-person ratio of 8.41 per 10,000 individuals during daytime (peak) hours. The project could generate 388 new residents in the City of San Bruno, which could lead to an increase in demand for police department services. The number of recreationists on the recreational fields at any given time would remain comparable to existing conditions, having no effect on the need for police protection services. The police department participates in a mutual aid agreement with the other law enforcement jurisdictions in San Mateo County, though this has a limited ability to provide police response services to the project site in a critical incident because additional authorization is required. According to the land use classifications in the General Plan (City of San Bruno 2009), buildout of all vacant and underutilized land could result in a population increase of 1,756 new residents, and approximately 682 new housing units. San Bruno's proposed General Plan buildout calculations project an increase in a 2025 population of 44,864 residents. The proposed project would increase the population to 41,843, with the addition of 388 residents. In addition, according to the General Plan (City of San Bruno 2009), new development projects proposed would be "infill" development already served by existing public services. The increase in population due to the proposed project is not in excess of what is already proposed in the buildout of the General Plan.

According to the police department, the population growth proposed as part of the proposed General Plan would not result in the need for additional department facilities (City of San Bruno 2009). Although new development would increase police calls for response, that would not result in the need for additional facilities. Furthermore, the development of the residential component of the proposed project and variant would increase property taxes collected by the City, which would fund City services like police protection. Additionally, insofar as the project's DIF would go to public safety efforts, including police capital facilities and infrastructure, including equipment (e.g., vehicles), those would have already been evaluated and identified as a need by the City. Therefore, no new facilities would be needed.

Based on the above, the project would not result in substantial adverse physical environmental impacts associated with the provision of new or physically altered police facilities to maintain acceptable service ratios, response times, or other performance objectives. The project variant would have the same impact as the proposed project because the same number of residents and recreationists could be on site as for the proposed project. As such, impacts on police protection would be **less than significant**.

Impact PS-3. Would this project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable performance objectives for schools? (Less than Significant)

Construction

As discussed in Impact POP-1, construction workers would not be expected to relocate to work on the proposed project and variant. Therefore, there would be no additional school enrollment due to construction and no need for additional facilities.

Operation

SBPSD estimated that each single-family detached unit will contribute 0.38 additional students for a single-family detached unit (Decision InSite Team 2020). Therefore, the project would generate 59 elementary school students. According to the most recent enrollment figures, total enrollment for the 2022–2023 school year was 2,019, a 3.2 percent decrease from the previous year and a 23.5 percent decrease from the 2017–2018 school year. This indicates that the addition of 59 students after this substantial decrease of student enrollment would be within the student count that can be accommodated by existing facilities. The project variant would have the same impact as the proposed project because the same number of residents could be on site as for the proposed project.

SBPSD estimated that each single-family detached unit will contribute 0.2 additional students for a single-family detached unit. (SMUHSD 2014). Therefore, the project would generate 31 high school students. According to the most recent enrollment figures, SMUHSD's total enrollment for the 2022–2023 school year was 9,487, a 1.7 percent decrease over the previous year and a 0.9 percent decrease from the 2018–2019 school year. This indicates that the addition of 31 students after this substantial decrease in study enrollment would be within the student count that can be accommodated by existing facilities. The project variant would have the same impact as the proposed project because the same number of residents would be on site as for the proposed

project. Therefore, project impacts related to SBPSD from the project would be **less than significant.**

Impact PS-4. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, to maintain acceptable service ratios or other performance objectives for libraries? (Less than Significant)

Construction

As discussed in Impact POP-1, construction workers would not be expected to relocate to work on the proposed project and variant. Therefore, there would be no additional library use due to construction and no need for additional facilities.

Operation

Because 60 percent of City residents have a library card, it is presumed that 60 percent of new residents would also have a library card. This means that approximately 233 new library cards would be associated with the new residents under the proposed project. The San Bruno Public Library is already documented as being too small to adequately service its current and future users. The San Bruno City Council has already agreed to consider the Downtown and/or Civic Center area as the preferred location for a new library, and the proposed General Plan already has established policies related to expanding existing library services (City of San Bruno 2009). The project would incrementally increase demand for library services. However, this incremental increase would be offset by development impact fees equal to $20,487.78 (2023) per unit for community services, which includes libraries. Therefore, the proposed project and project variant would have **less than significant** impacts.

3.14 Recreation

This section evaluates the project's potential environmental impacts on recreation. It first describes the existing recreation resources in and around the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.14.1 Existing Conditions

Regulatory Setting

State

Quimby Act

The Quimby Act (California Government Code Section 66477) authorizes cities and counties to pass ordinances requiring that developers set aside land, donate conservation easements, or pay park improvement fees as a condition to the approval of a tentative map or parcel map. Under the Quimby Act, fees must be paid and land conveyed directly to the local public agencies that provide park and recreation services communitywide. Revenues generated through the Quimby Act cannot be used for the operation and maintenance of park facilities. The act allows cities and counties to require the dedication of up to 3 acres of parkland per 1,000 persons residing in a subdivision subject to the act, or equal to the existing parkland ratio up to 5 acres per 1,000 residents if the existing ratio is greater than 3 acres. Exactions must show a reasonable relationship to a project's impacts as identified through studies.

The Quimby Act does not apply to new rental (apartment) units. Traditionally, developers in San Bruno fulfilled their Quimby Act requirements by paying the in lieu fee; however, the City found it discouraged the creation of new ownership (condominium) units and was challenging to calculate and assess on applicable development projects. For this reason, the San Bruno City Council approved the new Development Impact Fee (DIF) Ordinance on February 26, 2019 (Chapter 12.260 of the San Bruno Municipal Code), which repealed the City's Quimby Act in its entirety, instead relying on the provisions of Government Code Section 66000 et seq. to collect impact fees to fund the portion of the anticipated new park and recreation facility infrastructure and capital facilities needed to accommodate growth and maintain service standards. This prevented overlapping park dedication and in-lieu fee requirements, as the City's new Community Facilities DIF has a more streamlined calculation methodology and will fund parkland acquisitions necessary to serve all new development—including nonresidential development and rental units—going forward. The DIF Nexus Study allocated $60.5 million in future park facility costs based on the relative share of service population growth attributable to new residents and employees, respectively.

Local

San Bruno General Plan

The San Bruno General Plan (City of San Bruno 2009) outlines various goals, policies, and implementing programs relevant to parks and recreation. Population growth estimated under the General Plan anticipates a population of 44,864 residents within the City by 2025 (City of San Bruno 2009). According to the 2020 census, the City has approximately 43,906 residents (Census 2023).

The following General Plan policies are relevant to the proposed project.

- **OSR-1**: Maintain a parkland dedication/in lieu fee standard of 4.5 acres/1,000 residents.
- **OSR-4:** Undertake a program to add 20 acres of parkland to the City system over the next 20 years. Seize opportunities to develop and/or maintain parks and recreation facilities within existing residential neighborhoods through acquisition or preservation of former school facilities.
- **OSR-5:** Strive to locate neighborhood park facilities within 1/3-mile walking distance of all residences in San Bruno. If limited in some neighborhoods, coordinate with local school districts to allow use of playgrounds and sports facilities after school hours.
- **OSR-8:** During reuse of the former Crestmoor High School site (designated for single-family residential development), preserve the existing playing fields for recreational use per direction of the General Plan Update Committee.[1] [The proposed project includes a General Plan Amendment that addresses this policy.]
- **OSR-9:** Actively implement the City's Comprehensive Parks and Recreational Facilities Master Plan, which more fully identifies park and recreation needs and deficiencies.
- **OSR-10:** Continue coordination with San Bruno Park School District (per the Five-Year Joint Use Agreement, 2002) to allow joint use of school facilities for after-school programs, sports leagues, and nonorganized play.

Environmental Setting

City of San Bruno

Table 3.14-1 describes the parks in San Bruno. The closest parks serving the project site are Buckeye Park, Grundy Park, and Junipero Serra Park, a regional park operated by San Mateo County.

[1] At the December 13, 2022, regular council meeting, the San Bruno City Council initiated a future General Plan amendment to modify provisions contained in the General Plan regarding the property's playing fields. The amendments would reflect the preservation of a portion of the site with the fields as a public park. This includes the dedication of approximately 6.4 acres of rough graded area that the City could use for playing fields and other recreational space and facilities, subject to reservation of an easement for storm drainage, along with a rescission of Resolution No. 2022-04, regarding policy OSR-8 applicability to the project site. This information can be found on the City's website at: https://www.sanbruno.ca.gov/844/Crestmoor-300-Piedmont-Avenue.

Table 3.14-1. Park and Recreational Facilities in the City of San Bruno

Park	Acres	Distance to Project Site (approximate mileage)[a]
Pocket Parks[b]		
Catalpa Tot Lot	0.5	1.1
Earl-Glenview Park	0.5	0.8
Herman Tot Lot	0.3	1.7
Lomita Park	0.3	1.2
Posy Park	0.3	1.2
Neighborhood Parks[c]		
Bayshore Circle Park	0.5	1.7
Buckeye Park	7.0	0.2
Commodore Park	4.0	1.1
Fleetwood Tot Lot	0.5	1.4
Florida Ave Park (Future – Planned)	0.5	1.0
Forest Lane Park	1.3	1.4
Grundy Park	2.8	0.5
Lion's Field Park	3	1.3
Monte Verde Park	5	1.8
Pacific Heights Park	5	1.8
Ponderosa Park	0.8	2.6
Seventh Avenue Park	0.5	1.5
Seventh and Walnut Park	0.5	1.7
Community Parks[d]		
San Bruno City Park	31	0.7
Total City Parks	*64*	
Regional Parks[e]		
Junipero Serra Park (San Mateo County Parks)	108	0.3
Total Regional Parks	*108*	
School District Facilities with City Joint Use Agreement[f]		
Belle Air Elementary	4	1.3
Parkside Elementary	5	0.5
Total School	*19*	
Total Parkland	***191***	

[a] Approximate distance is measured in miles from the nearest point on the project site to respective recreational facility. Google Earth© was utilized.
[b] According to the San Bruno General Plan (2009), pocket parks are defined as small (less than 1-acre) facilities designed to serve residents of the surrounding blocks. They are generally limited to playgrounds and benches.
[c] According to the San Bruno General Plan (2009), neighborhood parks are designed to serve the residential neighborhoods close to the parks and accommodate a variety of activities including playgrounds, picnic tables, and turf areas.
[d] According to the San Bruno General Plan (2009), community parks are designed to serve several neighborhoods and provide a wide variety of activities, including sports facilities and recreational centers, and meet the needs of diverse users.

[e] According to the San Bruno General Plan (2009), regional parks are large parks and open spaces that provide recreational amenities to the surrounding region and generally contain passive facilities, such as picnicking, hiking trails, and spaces for large group events.
[f] Only public-school sites with a current (2019) City joint use agreement for recreation use by the public are shown.

Project Site

The project site currently contains two sports fields and the previous school facility. The school facility has no current use, only the recreational fields. The San Mateo Union High School District leases the playing fields located on the project site on a short-term basis to private soccer clubs (American Youth Soccer Organization [AYSO] and Lowen) for youth soccer games and practices. The playing fields are surfaced with natural grass. During winter months, the soccer clubs utilize portable flood lights to light portions of the playing fields to extend playing time after sunset. Use of the fields for private soccer activities varies by time of year; however, fall is the busier season for these activities. Currently, no more than eight games occur on the fields at one time. In addition to private league activities, informal use of the fields occurs throughout the week, such as for walking, running, and other similar workouts.

Lowen 83 has winter, spring, summer, and fall leagues, resulting in games throughout the year. Their games are on Saturdays or Sundays except in the fall, when they are generally on Sundays. The earliest games started at 9:00 a.m., and the latest games start at 6:30 p.m. Lowen 83 also holds practices Monday through Thursdays from 4:30 to 7:30 p.m.

The AYSO spring season (roughly March through May) has about eight games total at Crestmoor, typically scheduled on Sundays. The earliest games start at 9:00 a.m., and the latest (scheduled to start at 4:00 p.m.) are expected to end by 5:15 p.m. Overall, given the AYSO fall schedule, the fall season results in far more use at the Crestmoor fields than the spring season.

In addition, small passive open space areas are proposed on the east side of Courtland Drive. As part of the property subdivision process, property for the playing fields and other recreational and open space will be deeded to the city. The multi-use fields would be better designed than the current fields, and will be designed to allow for other types of field games, including one little league playing field.

3.14.2 Environmental Impacts

Methods for Analysis

This analysis determines whether the increase in population that would result from implementation of the project would cause a significant impact on existing park facilities. The analysis is informed by an assessment of whether the project would impede the City from achieving its parkland-to-population ratio goal of 4.5 acres for every 1,000 residents (General Plan Policy OSR-1). As noted, the City collects parkland mitigation fees through its DIF Ordinance, which identifies a need for additional parks to serve the City's existing service population. The DIF Ordinance repealed the City's Quimby Act ordinance in its entirety and has a more streamlined calculation methodology to fund parkland acquisitions necessary to serve all new development, including nonresidential development. Thus, the analysis also evaluates whether payment of development impact fees under the DIF Ordinance adequately mitigates project impacts. Additionally, the analysis evaluates the project's impacts related to the recreational sports fields present on the site based on historic sport field use by the public and potential impacts during and after project implementation.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant impact if it would result in any of the following conditions.

- Impact REC-1: Increased use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Impact REC-2: Construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Impacts and Mitigation Measures

Impact REC-1: Would the project increase use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would not occur or be accelerated? (Less than Significant)

Construction

Construction of the proposed project would create construction jobs on the project site. The number of construction workers on site would vary according to the stage of construction. It is unlikely that construction workers would visit the nearest parks during their lunch breaks and/or after work; however, if that were to occur, use would most likely be modest and would not increase physical deterioration of any facilities.

Construction of the recreation fields is expected to take about 12 months, whereas overall project construction is expected to take place over the course of 21 months. Field use would be limited until construction of all project components is complete. In that time the recreational fields on the project site would be closed to all users, which includes the full seasons of typical soccer use. The nearest neighborhood recreational facilities are Buckeye and Grundy Parks and the regional Junipero Serra Park run by San Mateo County, which would be open to the public and could be frequented during project construction by those who used the Crestmoor High School fields for informal recreation activities. Given the existing low level of informal recreational use exhibited by the public at the project site, the project is not expected to cause deterioration of nearby parks should community members utilize other recreational resources during construction for informal recreation.

During construction, soccer practices and games that are currently held at the project site's recreational fields would need to be relocated to offsite sport field locations. Such relocations are anticipated to occur throughout the construction term. The schedule of temporary relocations would be finalized by the leagues at a future date once construction schedules and the soccer leagues schedules are more accurately known; therefore, exact alternative locations of games and how many games would be played at each location cannot be currently described. However, the soccer leagues already host games and practices at nearby fields, and it is therefore presumed that during the temporary construction period the leagues would play more games at these fields. Use of these nearby fields would thus increase. For the purposes of this analysis, such relocations are anticipated to include the following sports fields based on historic use by the respective leagues.

- Lowen Soccer League games and practices could be temporarily held at Capuchino High School, Lion's Field, Monte Verde, and Parkside, all of which are located in San Bruno. Additionally, the

league could utilize the El Camino High School Turf Stadium, which is in the City of South San Francisco (Lowen '83 2023).

- The AYSO League games and practices could be temporarily held in nearby cities such as Daly City, Brisbane, Pacifica, and Millbrae. The league could also temporarily hold games and practices at the Parkside grass field in San Bruno.

The Capuchino High School sports field and Lion's Field are both synthetic turf fields, whereas the other facilities are natural grass fields. Synthetic turf fields are more durable than their grass counterparts. Games and practices would also likely be distributed among the nearby fields instead of taking place all at one field, reducing the amount of wear and tear on each field. This displaced use would also be temporary, limiting the time during which additional games would occur at other facilities. Therefore, the project is not anticipated to result in increased use of parks or recreational facilities such that substantial physical deterioration of any field would occur.

The project variant and proposed project both require a construction window of 21 months and restrict public access to the site to the same degree during the construction period; therefore, the project variant construction impacts on existing neighborhood and regional parks are identical to the proposed project. Impacts would be **less than significant**.

Operation

The recreational fields would be reduced in size under the proposed project and variant compared to existing conditions. The project proposes the replacement of the existing eight fields with six multi-use fields, restroom facilities, equipment storage, picnic area, parking lot, field lighting, and additional amenities. The proposed project would include dedication of approximately 6.91 acres of public open space to the City, which the City would own and maintain, as shown on Figure 2-2 in Chapter 2, *Project Description*. The City would also construct improvements within about 5.3 acres of the 6.91 acres of the dedicated open space area in the northern area of the project site, including the sports field and lighting. As of the writing of this Draft EIR, the configuration of the fields has not been finalized. However, it is anticipated the field design would allow for a maximum of six soccer fields in use at any one time. Another option would include striping for up to two little league baseball fields and five soccer fields, allowing for a maximum of two little league games or five soccer games to occur at one time, as seen on Figure 2-5 of Chapter 2. The City also intends to develop various recreation, recreation-supporting amenities, and/or parking on about 1.61 acres adjacent to Courtland Drive. Additionally, the proposed project includes 12.29 acres of publicly accessible open space. The project variant includes 12.24 acres of dedicated open space, 4.58 acres of which are playing field space. The project variant also includes 1.19 acres of recreational supportive area along Courtland Drive and 6.47 acres of wooded slopes, both of which are included in the dedicated open space acreage total. The project variant also proposes 7.51 acres of private open space. The proposed project and project variant include neighborhood community spaces, which include amenities such as a tot lot and areas with a more passive design.

The playing fields and other recreational uses would be the same as under the proposed project and variant except that the variant would include a primary stormwater treatment basin located within a triangular-shaped 0.75-acre parcel that would be owned and maintained by the Homeowners Association (HOA). The project variant would be the same as the proposed project, except that under the project variant, Courtland Drive would be a public street parcel with no recreation-supportive improvements (as described in Section 2.3.2, *Recreational and Open Space Component,* of

Chapter 2). The Courtland Drive right-of-way would instead be 2.1 acres. All recreational improvements within the Courtland Drive right-of-way would be implemented by the City.

Under the project, the maximum games at one time would be decreased from eight to six. However, the park could be programmed by the City to allow for additional use for other recreational sports, activities or events or additional playing hours if lighting is installed.

During the 2022 spring soccer season, Lowen had 3 days on which more than six games were played at a given time, and 40 days where six or fewer games were played. The average games played per day for the Lowen 2022 Spring Season was 2.8.[2] During the 2022 AYSO spring season, eight games were played at the project site at a given time; however, games were only played on select Saturdays and had very little overlap with the Lowen league.

Project implementation may result in the leagues changing their scheduled use of the Crestmoor High School fields or deciding to host games elsewhere given the reduction in field space (see *Construction*). The new lighting at the sports fields would allow for practices and games to run into evening hours; however, the reduction in recreational fields is expected to reduce the overall volume of games played on the project site during the soccer season. Outside of the soccer season, the fields are expected to receive a higher volume of visitors due to regular park visitors, including residents at the project site, and the potential for other sports, such as baseball practices. Games and practices could be distributed among the nearby fields if they cannot be accommodated at the new recreation field on the Crestmoor High School site; however, the precise distribution of games among other sites cannot be currently described as that would be decided by the city by scheduling through the Community Services Department once the City takes ownership of the property. The new field could be synthetic turf or natural grass. As discussed for the construction impacts, synthetic turf is less likely to be impacted by increased use due to the material's durability compared to natural grass. Regardless of field material, the project is not anticipated to result in increased use of parks or recreational facilities such that substantial physical deterioration of any one field would occur. Additionally, it is probable that rental fees for other fields are used to address maintenance needs associated with use (see, for example, SMUHSD 2023). Therefore, the project is not anticipated to result in increased use of parks or recreational facilities such that substantial physical deterioration of any field would occur.

The playing fields and other recreational uses are the same under the proposed project and variant except for a difference of 1.14 acres in the graded area, which is discussed under Impact REC-2 and would have no effect on the number of playing fields provided. Once the graded area is deeded to the city and the property is improved with playing fields with additional amenities, use of the area could increase, depending on how the city chooses to program the space. Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. However, at this time, the City has no certain future users; therefore, the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and cannot be further analyzed. Overall, the impact on neighboring recreational resources from both the project and the project variant during operations would be **less than significant.**

[2] There were 121 games played throughout the season in total over the course of 43 days, which is an average of 2.8 games per day.

Impact REC-2: Does the project include recreational facilities or require construction or expansion of recreational facilities that would have an adverse physical effect on the environment? (Less than Significant)

The proposed project includes construction of recreational facilities on an existing sporting field and projected soccer practices and games and baseball practices, the impacts of which are discussed throughout this environmental impact report (EIR). This evaluation therefore focuses on whether, given the residential component of the project, any additional recreational facilities would be needed and, if so, whether they would result in an adverse physical effect on the environment.

Currently there are 191 acres of recreational space for public use located in San Bruno, 10 acres of which include the Crestmoor High School multi-use sports fields, which would be redeveloped under the proposed project. The proposed project includes 6.91 acres of dedicated open space, 5.3 acres of which are playing field space with a playing field capacity of six fields. The proposed project also includes 12.29 acres of publicly accessible planned unit permit open space. The project variant includes 12.24 acres of dedicated open space, 4.58 acres of which are playing field space with the capacity for five fields (or six fields of reduced size). The project variant also includes 1.19 acres of recreational supportive area and 6.47 acres of wooded slopes, both of which are included in the dedicated open space acreage total. The project variant also proposes 7.51 acres of private open space.[3] The project includes the construction of 155 single-family detached homes, which is expected to increase the community's population by 388 residents.

The General Plan defined existing and projected parkland needs according to the ratio requiring 4.5 acres of parkland per 1,000 residents. The existing ratio in the City of San Bruno is 4.4 acres of parkland per 1,000 residents. Table 3.14-2 details the population-to-parkland projections for the proposed project and variant.

Table 3.14-2. General Plan Projections Versus the Proposed Project and Variant

Year	Population	Parkland (acres)	Acres/1,000 residents	Parkland Required (General Plan, acres)	Meets Requirement?	Maintains baseline ratio? (4.4 acres/1,000 residents)
2000	40,165	180	4.5	180	Yes	—
2023[a] (baseline)	**43,906**	**191**	**4.4**	**196**	**No**	**—**
2023[b] (with project)	44,294	187.91	4.2	198	No	No
2023[c] (with variant)	44,294	186.77	4.2	198	No	No
2027[d] (with project)	43,854	187.91	4.3	~196	No	No

[3] **Project:** 191–10=181, 181+6.91=187.91. The current parkland total is 191, and this includes the baseline estimate of 10 acres of parkland provided by the Crestmoor recreation fields. Subtracting the original 10 acres and adding back the proposed dedicated open space estimates under the proposed project yields the 187.91 total acreage.
Variant: 191–10=181, 181+4.58+1.19 =186.77. The current parkland total is 191, and this includes the baseline estimate of 10 acres of parkland provided by the Crestmoor recreation fields. Subtracting the original 10 acres and adding back the dedicated open space estimates under the project variant yields the 186.77 total acreage.

Year	Population	Parkland (acres)	Acres/1,000 residents	Parkland Required (General Plan, acres)	Meets Requirement?	Maintains baseline ratio? (4.4 acres/1,000 residents)
2027[e] (with variant)	43,854	186.77	4.3	~196	No	No

[a] The population estimate used is the city population according to the 2020 census provided by the United States Census Bureau alongside the current (2023) acreage of parkland in the city, including the current Crestmoor recreational fields.
[b] The population estimate is the city population according to the 2020 census plus the added population from the proposed project.
[c] The population estimate is the city population according to the 2020 census plus the added population from the project variant.
[d] The 2027 population estimate comes from the California Department of Finance population projections for San Mateo County until the year 2060 found here: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fdof.ca.gov%2Fwp-content%2Fuploads%2Fsites%2F352%2F2023%2F07%2FP2A_County_Total.xlsx&wdOrigin=BROWSELINK. The percent change predicted for San Mateo County is an overall decrease of approximately 1%. This percent change was applied to the 2023 San Bruno population estimate according to the U.S. Census. The expected population increase as a result of the proposed project was then added.
[e] The 2027 population estimate comes from the California Department of Finance population projections for San Mateo County until the year 2060 found at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fdof.ca.gov%2Fwp-content%2Fuploads%2Fsites%2F352%2F2023%2F07%2FP2A_County_Total.xlsx&wdOrigin=BROWSELINK. The percent change predicted for San Mateo County is an overall decrease of approximately 1%. This percent change was applied to the 2023 San Bruno population estimate according to the U.S. Census. The expected population increase as result of the project variant was then added.
Sources: City of San Bruno. 2009; State of California Department of Finance 2023.

The proposed project and project variant are below the General Plan requirement of 4.5 acres of parkland per 1,000 residents and also worsens the existing (2023) parkland ratio of 4.4 acres of parkland per 1,000 residents, as shown in Table 3.14-2. To account for this the applicant would be required to pay development impact fees to satisfy the City's parkland dedication requirement pursuant to the DIF Ordinance enacted under Government Code 66000 et seq. Consistent with policy OSR-1, the fee standard would be 4.5 acres/1,000 residents. Payment of the fees helps fund anticipated new park and recreation infrastructure and capital facilities needed to accommodate growth and maintain service standards. The fees paid by future developers would be used by the City to acquire and/or improve new park and recreation infrastructure and capital facilities. New facilities would be subject to their own independent CEQA review. Payment of the development impact fee would address the project's share of the improvement and/or expansion of capital facilities and infrastructure. Therefore, the proposed project and project variant would have a **less-than-significant** impact on the physical environment relative to the construction or expansion of recreational facilities.

3.15 Transportation

This section evaluates the project's potential environmental impacts on transportation. It first describes the existing transportation network and characteristics the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.15.1 Existing Conditions

Regulatory Setting

For the purposes of transportation, a jurisdiction is a level of government (city, county, state, or federal) or regulatory authority (local, regional, state, or federal) that is responsible for some or all aspects of the planning, implementation, operations, and maintenance of transportation facilities and services in a defined area. Several of the regional, state, and federal agencies that are described in the following sections have jurisdiction over transportation planning and implementation of circulation improvements in San Bruno.

Federal

Americans with Disabilities Act of 1990

The Americans with Disabilities Act of 1990 (revised 2010) is a landmark civil rights law that prohibits discrimination based upon disability. Titles I, II, III, and V of the act have been codified in Title 42 of the United States Code, beginning at Section 12101. Title III prohibits discrimination on the basis of disability in "places of public accommodation" (businesses and nonprofit agencies that serve the public) and "commercial facilities" (other businesses). The regulation includes Appendix 4.13-A to Part 36 (Standards for Accessible Design), which establishes minimum standards for ensuring accessibility for persons with a disability when designing and constructing a new facility or altering an existing facility, including roadways, parking lots, and sidewalks. Examples of key guidelines include detectable warnings for pedestrians when entering traffic at a curb ramp (section 4.7.7 of the ADA Accessibility Guidelines) and a clear zone of 48 inches for the pedestrian travel way (see, e.g., section 4.7.10 of the ADA Accessibility Guidelines for requirements for diagonal curb ramps).

State

California Department of Transportation

The California Department of Transportation (Caltrans) has authority over the state highway system, including freeways, interchanges, and arterial routes. In the general San Bruno area, Caltrans has jurisdiction over US 101, Interstate (I-) 280, I-380, State Route (SR) 35 (Skyline Boulevard), and SR 82 (El Camino Real). Caltrans also has jurisdiction over on- and off-ramp intersections with local streets. The *Guide for the Preparation of Traffic Impact Studies* (Caltrans 2002) provides information that Caltrans uses to review impacts on state highway facilities, including freeway segments. This guidance was updated by the *Local Development* –

Intergovernmental Review Program Interim Guidance published in November 2016 for consistency with Senate Bill (SB) 743.

Assembly Bill 32 and Senate Bill 375

With the passage of Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, the State of California committed itself to reducing greenhouse gas (GHG) emissions to 1990 levels by 2020. The California Air Resources Board (CARB) is coordinating a response to comply with AB 32. In 2008, CARB defined its 1990 baseline level of emissions. On December 11, 2008, CARB adopted its *Proposed Scoping Plan for AB 32*. This scoping plan included the approval of SB 375 as the means for achieving regional transportation-related GHG targets. In 2011, CARB completed its major rulemaking for reducing GHG emissions. Rules on emissions, as well as market-based mechanisms such as the cap-and-trade program, took effect on January 1, 2012.

SB 375 provides guidance regarding curbing emissions from cars and light trucks to help the state comply with AB 32. There are four major components to SB 375. First, SB 375 requires regional GHG emissions targets. CARB's Regional Targets Advisory Committee will guide the adoption of targets to be met by 2035 for each Metropolitan Planning Organization (MPO) in the state. These targets, which MPOs may propose themselves, must be updated every 8 years in conjunction with the revision schedule of the housing and transportation elements of local general plans. Second, MPOs are required to create a Sustainable Communities Strategy (SCS) that provides a plan for meeting regional targets. The SCS and the Regional Transportation Plan (RTP) must be consistent, including action items and financing decisions. If the SCS does not meet the regional target, the MPO must produce an Alternative Planning Strategy that details an alternative plan for meeting the target. Third, SB 375 requires regional housing elements and transportation plans to be synchronized on 8-year schedules. In addition, Regional Housing Needs Assessment allocation numbers must conform to the SCS. If local jurisdictions are required to rezone land as a result of changes in the housing element, rezoning must take place within 3 years of adoption of the housing element. Finally, MPOs must use transportation and air emissions modeling techniques that are consistent with the guidelines prepared by the California Transportation Commission. Regional Transportation Planning Agencies, cities, and counties are encouraged, but not required, to use travel demand models that are consistent with California Transportation Commission guidelines. The adopted RTP, per SB 375 (Plan Bay Area 2050), is discussed under the *Regional* regulatory setting.

Complete Streets (Assembly Bill 1358)

AB 1358, also known as the California Complete Streets Act of 2008, requires cities and counties to include "complete street" policies in their general plans. These policies address the safe accommodation of all users, including bicyclists, pedestrians, motorists, public transit vehicles and riders, children, the elderly, and persons with disabilities. These policies can apply to new streets, as well as the redesign of corridors.

Senate Bill 743

With the passage of SB 743 (September 27, 2013) and the subsequent adoption of the revised California Environmental Quality Act (CEQA) Guidelines (December 28, 2018), level of service (LOS) can no longer be used as a criterion for identifying significant transportation impacts for most projects under CEQA effective July 1, 2020. LOS measures the average amount of delay experienced by vehicle drivers at an intersection during the most congested time of day, while the new metric,

vehicle miles traveled (VMT) measures the total number of daily miles traveled by vehicles on the roadway network and thereby the impacts on the environment from those miles traveled.

In other words, SB 743 changes the focus of transportation impact analysis in CEQA from measuring impacts on drivers to measuring the impact of driving. Land use projects with one or more of the following characteristics would have lesser VMT impacts.

- Higher land use densities.
- Mix of project uses.
- Support of a citywide jobs-housing balance (i.e., provide housing in a job-rich area, or vice versa).
- Proximity to the core of a region.
- Proximity to high-quality transit service.
- Location in highly walkable or bikeable areas.

This shift in transportation impact criteria is intended to better align transportation impact analysis and mitigation outcomes with the state's goals to reduce GHG emissions, encourage infill development, and improve public health through more active transportation. Specific to SB 743, Section 15064.3(c) of the revised State CEQA Guidelines states that, "a lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide." Public Resources Code Section 21099(b)(2) states that, "upon certification of the guidelines by the Secretary of the Natural Resources Agency pursuant to this section, automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the Guidelines."

Although the Governor's Office of Planning and Research (OPR) provides recommendations for adopting new VMT analysis guidelines, lead agencies have the final say in designing their methodology. Lead agencies must select their preferred method of estimating and forecasting VMT, their preferred significance thresholds for baseline and cumulative conditions, and the mitigation strategies they consider feasible. Lead agencies must prove that their selected analysis methodology aligns with SB 743's goals to promote infill development, reduce GHGs, and reduce VMT.

Regional

Metropolitan Transportation Commission

Metropolitan Transportation Commission (MTC) is the Bay Area's regional transportation planning agency and federally designated MPO. MTC is responsible for preparing the RTP, a comprehensive blueprint for the development of mass transit, highway, airport, seaport, railroad, bicycle, and pedestrian facilities. The RTP is a 20-year plan that is updated every 3 years to reflect new planning priorities and changing projections of future growth and travel demand. The long-range plan must be based upon a realistic forecast of future revenues, and the transportation projects taken as a whole must help improve regional air quality. MTC also screens requests from local agencies for state and federal grants for transportation projects to determine compatibility with the RTP.

Plan Bay Area 2050, adopted in October 2021, is the Bay Area's RTP/SCS as required by SB 375 (Stats. 2008, chapter 728). Plan Bay Area 2050 is a state-mandated, integrated long-range transportation and land use plan intended to meet GHG reduction targets.

Bay Area Air Quality Management District

The Bay Area Air Quality Management District is the regional agency with the authority to develop and enforce regulations for the control of air pollution throughout the Bay Area. The Clean Air Plan is the district's plan for reducing the emissions of air pollutants that combine to produce ozone. The Bay Area Air Quality Management District has published guidelines for the purpose of evaluating the air quality impact of projects and plans. Transportation Control Measure TR10 calls for general plans to support implementation of Plan Bay Area and collaborate with regional partners to identify innovative funding mechanisms to help local governments address air quality and climate change in their general plans (BAAQMD 2017a).

On-road motor vehicles are one of the largest sources of air pollution in the Bay Area (BAAQMD 2017). To address the impact of vehicles, the California Clean Air Act requires air districts to adopt, implement, and enforce transportation control measures.

San Mateo County

The City of San Bruno is subject to regulations set by the County of San Mateo and the San Mateo City/County Association of Governments (C/CAG). The County of San Mateo has jurisdiction over streets in unincorporated areas. Streets and intersections within San Francisco International Airport (SFO) boundaries are owned and policed by the City and County of San Francisco. Transit agencies that operate within the city limits are the San Mateo County Transit District (SamTrans), Caltrain, Bay Area Rapid Transit (BART), and Commute.org.

San Mateo City/County Association of Governments

As the designated Congestion Management Agency for San Mateo County, the San Mateo C/CAG is primarily responsible for administering the state-mandated Congestion Management Program (CMP). San Mateo C/CAG-designated CMP roadway system components in San Bruno include SR 35 (Skyline Blvd.), SR 82 (El Camino Real), US 101, I-380, and I-280.

The San Mateo C/CAG is also responsible for preparing the Countywide Transportation Plan, which establishes a long-range transportation vision for the county and informs the RTP/SCS prepared by MTC and the Association of Bay Area Governments. The current version of the plan looks at horizon year 2050 and was adopted in October 2021. The San Mateo C/CAG also partners with local jurisdictions and other transportation agencies to develop transportation plans and studies for areas and projects with countywide and regional significance. C/CAG maintains the countywide C/CAG-VTA Travel Model and has a countywide threshold of 100 added peak-hour trips when determining whether a Transportation Demand Management (TDM) plan for development projects is required; however, single-family homes are exempted due to the limited effectiveness of TDM plans for reducing vehicle trips for this type of land use.

San Mateo County Transit District

SamTrans is the administrative body for the principal public transit and transportation programs in San Mateo County: SamTrans bus service, including Redi-Wheels & RediCoast paratransit service; Caltrain commuter rail; and the San Mateo County Transportation Authority. Caltrain and the San

Mateo County Transportation Authority have contracted with SamTrans to serve as their managing agency, under the direction of their appointed boards.

SamTrans' Short-Range Transit Plan is a federally mandated planning document that describes the plans, programs, and goals of the SamTrans transit service. It has a 10-year planning horizon and is updated annually, and it focuses on the characteristics and capital needs of the existing system and on committed (funded) expansion plans. The current plan proposes increased service levels for fixed-route transit, including new express bus routes, increased paratransit services, and increased commuter shuttles. SamTrans will also continue to contribute monetarily to Caltrain service and replace and expand the bus vehicle fleet.

Local

The City of San Bruno has jurisdiction over all public City streets and City-operated traffic signals. The neighboring cities of South San Francisco, Pacifica, and Millbrae have jurisdiction over local roadways within their respective jurisdictional boundaries. The City of San Bruno guides land use planning decisions within the city's boundaries. The City's existing planning documents and Zoning Code guide development review. In the project area, this includes the San Bruno General Plan (2009), the San Bruno Walk 'N Bike Plan (2016), and the Transit Corridors Plan (2013). The City completed a Zoning Code update in 2021.

San Bruno General Plan (2025)

The San Bruno General Plan (2025) was adopted March 24, 2009. The state requires every city and county in California to prepare a general plan to guide decision-making by the city council, planning commission, city departments, and other governmental agencies on specific development applications. The San Bruno General Plan has identified Transportation, Land Use and Urban Design, and Open Space and Recreation policies related to access and mobility. These policies include measures such as providing efficient local transit to BART and Caltrain, maintaining acceptable LOS for vehicular movement along the street network, and focusing San Bruno's efforts on improvements to the nonmotorized transportation system adjacent to transit corridors and stations. These measures support multi-modal transportation design throughout the city while promoting efficient, safe, and pleasant movement for all transportation modes. San Bruno has recently updated its Housing Element of the General Plan. The City sent the adopted San Bruno Housing Element to the California Department of Housing and Community Development (HCD) on January 31, 2023. HCD provided a letter to the City on March 29, 2023, that outlines additional revisions that are needed to comply with State Housing Element Law. As of the writing of this Draft EIR, HCD has not yet issued a letter finding that the City's adopted Housing Element is in substantial compliance.

Transit Corridors Plan

The City of San Bruno Transit Corridors Plan was adopted on February 12, 2013. The plan presents the community's vision for revitalizing commercial corridors near the San Bruno Avenue Caltrain Station. The Transit Corridors Plan encompasses introducing new architecture, convenient transportation connections, pedestrian-oriented "green" streets, and increasing development while maintaining the history of the City.

Implementation of the plan consists of a subset of smaller plans including the 2017 Downtown Parking Management Plan, 2017 Downtown Streetscape Improvement Plan, 2016 Walk n' Bike Plan, and 2014 Measure N.

San Bruno Walk 'N Bike Plan

The City of San Bruno Walk 'N Bike Plan was adopted July 26, 2016. The plan presents the desired state of walking and biking in San Bruno 10 years out that would result from implementation of the Walk 'N Bike Plan. In recognizing the public's desire for an improved network of sidewalks, street crossings, bike lanes, bike routes, and walking and biking paths and trails to access more destinations, the City aims to provide access to an expanded range of programs, events, and activities in the areas of pedestrian and bicycle safety, education, encouragement, and promotion.

Chapters 5 through 8 of the Walk 'N Bike Plan identify specific infrastructure projects and program action items that would implement the City's vision.

Environmental Setting

Regional Setting

Roadway System

Four prominent regional routes surround the project site: I-280, I-380, SR 82/El Camino Real, and SR 35/Skyline Boulevard. The regional and local circulation system in the vicinity of the project site is shown on Figure 3.15-1.

I-280 is a north-south freeway that runs north from San Jose to San Francisco. I-280 acts as the eastern boundary of the project site and can be accessed directly from San Bruno Avenue or the I-380 interchange through the Cunningham Way on-ramp near Crystal Springs Road. There are no high-occupancy vehicle (HOV) lanes on I-280 in San Mateo or San Francisco Counties. Near the project site, there are four travel lanes in each direction and occasionally an auxiliary lane in both the northbound and southbound directions. The I-280 entrance and exit ramps at San Bruno Avenue provide the most direct access to the project site for regional travel.

I-380 is a 1.7-mile east-west freeway in San Mateo County that connects I-280 with US 101. Trips can access the project site through El Camino Real and San Bruno Avenue West. There are four travel lanes in the westbound and eastbound directions and no HOV lanes on the freeway.

SR 82/El Camino Real refers to a segment of the historic "King's Highway" route through southern and much of northern California. SR 82/El Camino Real defines the section of this route that runs north-south along the southwestern boundary of San Francisco Bay, connecting I-880 in San Jose with San Francisco. The six-lane roadway parallels Caltrain tracks for much of its route through San Mateo County. Although traffic volumes and speed limits are lower than on the surrounding freeways, SR 82/El Camino Real is an important regional route that connects many downtowns and important commercial centers along the peninsula. SR 82/El Camino Real is also the primary bus transit route through San Bruno and surrounding cities.

SR 35/Skyline Boulevard is a north-south arterial that runs north from San Bruno to San Francisco. SR 35/Skyline Boulevard. Near the project site, there is one travel lane in each direction with an auxiliary lane occasionally in both the northbound and southbound direction. Regional travel from SR 35/Skyline Boulevard will use San Bruno Avenue to access the project site.

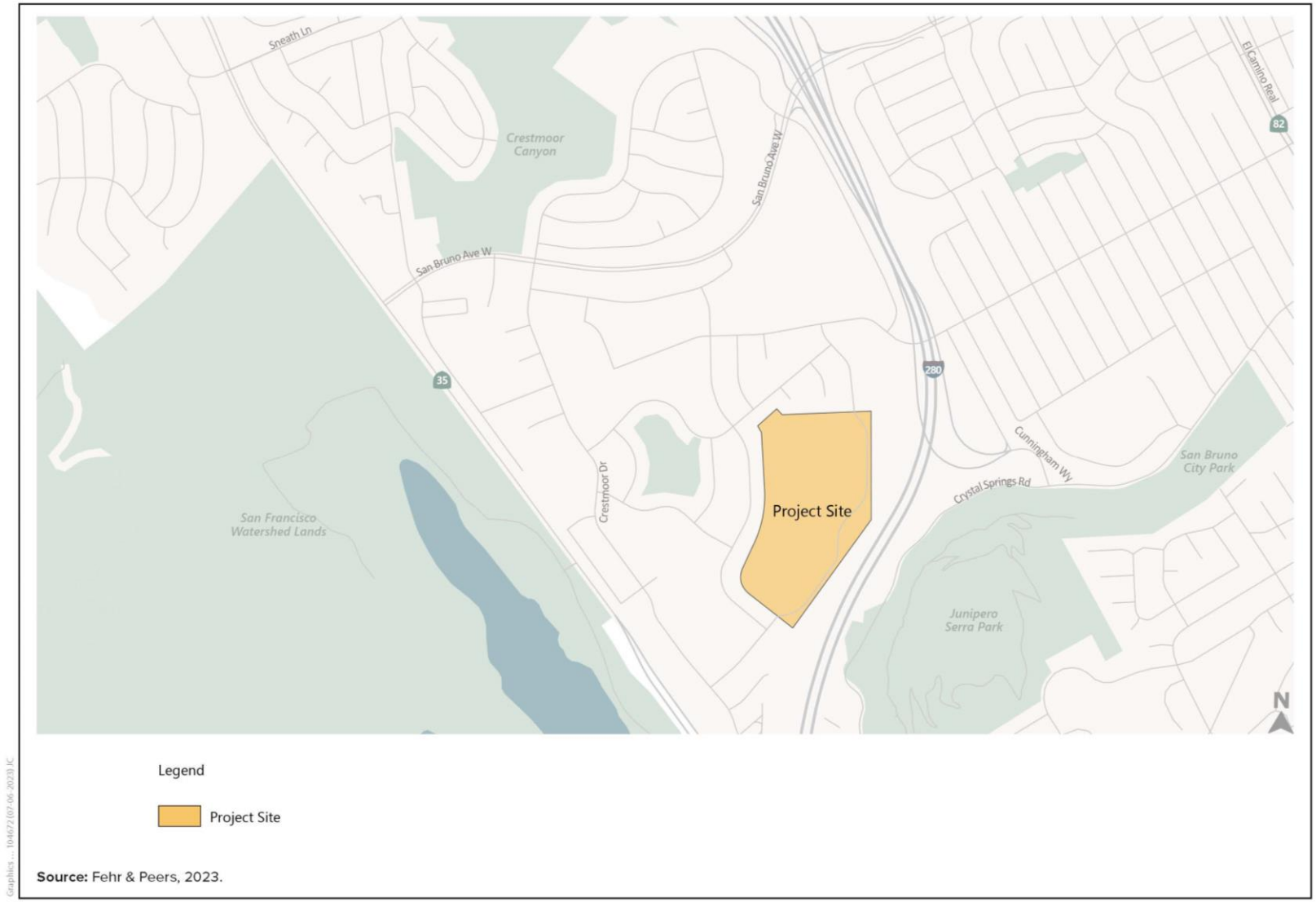


Figure 3.15-1. Regional and Local Roadways

Transit

SamTrans is the primary regional and local transit provider within San Mateo County, serving all rail stations within the county and major transit transfer points for Santa Clara and San Francisco Counties. The San Bruno BART station is a little under 2.5-mile walk from the northern edge of the project site. The San Bruno Caltrain station is a little over 1.5-mile walk from the northern edge of the project site. Bus service near the project site is provided a little less than 0.5-mile walk from the northern edge of the project site along Whitman Way / Jenevein Avenue. Table 3.15-1 illustrates the existing SamTrans, BART, and Caltrain routes and stops in the vicinity of the project site. SamTrans' route 142, from SFO AirTrain to Shelter Creek and Fire Road 1, provides the nearest transit stop to the project site. Route 142 operates on 30- to 60- minute headways. SamTrans' routes 41 and 42 also provide service near the project site. However, routes 41 and 42 only run one to two services before and after school hours. Multiple state laws related to parking and VMT apply to projects near "high-quality" transit defined as service that arrives every 15 minutes or more frequently. The SamTrans bus routes near the project site all arrive less frequently than every 15 minutes and, thus, do not qualify as high-quality routes.

Table 3.15-1. Existing Transit Network

Line	Route	Nearest Stop	Nearest Stop Distance from project site (miles)	Weekday Operations		Weekend Operations	
				Hours of Operation	Frequency	Hours of Operation	Frequency
142 (Bus)	SFO AirTrain – Shelter Creek/Fire Road 1	Shelter Creek at Jenevein Avenue	0.5	6:00 a.m.–6:20 p.m.	60 minutes	7:00 a.m.–6:20 p.m.	60 minutes
41 (Bus)	San Bruno BART – Niles/Cedar	Niles at Cedar	1	7:30 a.m.–3:40 p.m.	--	--	--
42 9Bus)	San Bruno BART – West Manor/Palmetto	Niles at Cedar	1	7:30 a.m.–4:00 p.m.	--	--	--
BART (Train)	Antioch/Richmond – SFO/Millbrae	Huntington at Tanforan	2.5	NB: 5:15 a.m.–12:00 a.m. SB: 6:05 a.m.–1:30 a.m.	~15–20 minutes	NB: 8:20 a.m.–12:00 a.m. SB: 9:00 a.m.–1:30 a.m.	~20 minutes
Caltrain (Train)	4th and King (San Francisco) – San Jose Diridon/Gilroy	Huntington at San Mateo Avenue	2	NB: 5:40 a.m.–11:40 a.m. SB: 5:15 a.m.–12:25 a.m.	Varies from 15–45 minutes	NB: 10:00 a.m.–11:30 p.m. SB: 8:30 a.m.–10:00 p.m.	60 minutes

NB = northbound; SB = southbound

Project Site

Roadway System

The local circulation system serving the project site and its vicinity is shown on Figure 3.15-1. The following roadways provide local access to the project site.

San Bruno Avenue is a major east-west arterial through the City of San Bruno, extending to Skyline Boulevard to the west and SFO to the east. San Bruno Avenue provides freeway access to both I-280 and US 101. Near the project site, on-street parking is not permitted, and a planted median divides the roadway. There are sidewalks west of Crestmoor Drive, but no pedestrian facilities between Crestmoor Drive and I-280. There are no bicycle facilities on San Bruno Avenue.

Courtland Drive/Piedmont Avenue is a two-lane roadway that runs through to the project site. Courtland Drive is a north-south connection between Whitman Way and Crestmoor Drive. Courtland Drive/Piedmont Avenue is the primary roadway in and out of the project site. There are no sidewalks on the east side of Courtland Drive within the project site. There are sidewalks on both sides of Piedmont Avenue south of the project site.

Jenevein Avenue/Whitman Way serves as an east-west connection between San Mateo Avenue and Princeton Drive, which connects to San Bruno Avenue via Crestmoor Drive and El Camino Real to the east. There is one travel lane in each direction with no on-street parking restrictions. There are sidewalks on both sides of the street.

Shelter Creek Lane serves as a north-south connection between San Bruno Avenue West and Whitman Way. Shelter Creek Lane serves as part of the connection from I-280 NB off ramp to the northern entry of the project site. There is one travel lane in each direction with no on-street parking restrictions. There are sidewalks only on the west side of the street.

Cunningham Way serves as a north-south connection between Jenevein Avenue and Crystal Springs Road. Cunningham Way serves as part of the connection from the I-280 SB off ramp through Jenevein Avenue, which becomes Whitman Way at the intersection with Shelter Creek Lane, to the northern part of the project site. There is one travel lane in each direction with on-street parking permitted on the west side of the street. There are sidewalks only on the west side of the street.

Crestmoor Drive runs north-south between San Bruno Avenue and Crystal Springs Road. Crestmoor Drive serves as part of the connection via Piedmont Avenue to the southern entry of the project site. There are sidewalks on both sides as well as permitted on-street parking.

Transit

There are no public transit stops within the project site. There are two public transit stops near the project site, including both eastbound and westbound stops for SamTrans Route 142 on Whitman Way / Jenevein Avenue, which are 0.5 miles away from the northern edge of the project site.

Pedestrian Network

Sidewalks are provided on the west side of Courtland within the project site. Outside of the project site, sidewalks are present on both sides of Courtland Drive, Piedmont Avenue, Crestmoor Drive, and Whitman Way/Jenevein Avenue. Sidewalks range in width from approximately 5 feet on Whitman Way to 7 feet on Courtland Drive; other sidewalk widths in the area are somewhere

between this minimum and maximum. Most sidewalks near the project site do not contain Americans with Disabilities Act accessible features, such as directional curb ramps and truncated domes. Sidewalk pavement is generally in good condition with no obstructions.

There are standard crosswalks across the following Courtland Drive cross-streets: Rosewood Drive and Whitman Way. There are no marked crosswalks along the other Courtland Drive cross-streets.

Based on field observations, local pedestrian activity on the project site is high when soccer games are in session on the fields. Local pedestrian activities consist of pedestrians traveling from the soccer fields to their cars parked nearby. Outside of programmed recreation activities, very low levels of pedestrian activity were observed around the project site.

The project site is at the top of a hill, which presents a potential deterrent for pedestrians, especially those originating north of the project on Whitman Way (traveling to and from bus stops) or San Bruno Avenue (accessing shopping options).

The Walk 'N Bike Plan does not propose any pedestrian infrastructure improvements within or adjacent to the project site. The Walk 'N Bike Plan does propose the construction of a new sidewalk along San Bruno Avenue between Crestmoor Drive and Princeton Drive.

Bicycle Network

Bicycle facilities are typically separated into four classes:

- **Class I (Bicycle Path)**: These facilities are located off-street and can serve both bicyclists and pedestrians.
- **Class II (Bicycle Lanes)**: These facilities provide a dedicated area for bicyclists within the paved street width through the use of striping and appropriate signage.
- **Class III (Bicycle Routes)**: These facilities are installed along streets that do not provide sufficient width for dedicated Class II bicycle lanes. The street is designated as a bicycle route, where bikes and cars share the road through the use of on-street markings and signage, which inform drivers to expect bicyclists.
- **Class IV (Cycletrack/Protected Bicycle Lanes)**: These facilities are for the exclusive use of bicycles and require a vertical element that serves as a barrier separating the bikeway and adjacent vehicular traffic.

Currently, Class III bicycle routes are provided along a small stretch of Crestmoor Drive, west of the project site, between Yorkshire Court and Piedmont Avenue. This facility does not serve as a direct route to the project site, and no bicycle facilities are currently in place on the project site. Figure 3.15-2 illustrates the existing and proposed dedicated bicycle facilities near the project site, as described in Chapter 6 of the City of San Bruno Walk 'N Bike Plan. The Walk 'N Bike Plan proposes several new facilities near the project site, including Class II bike lanes on San Bruno Avenue and Skyline Boulevard. There is no firm timeline associated with the proposed facilities.

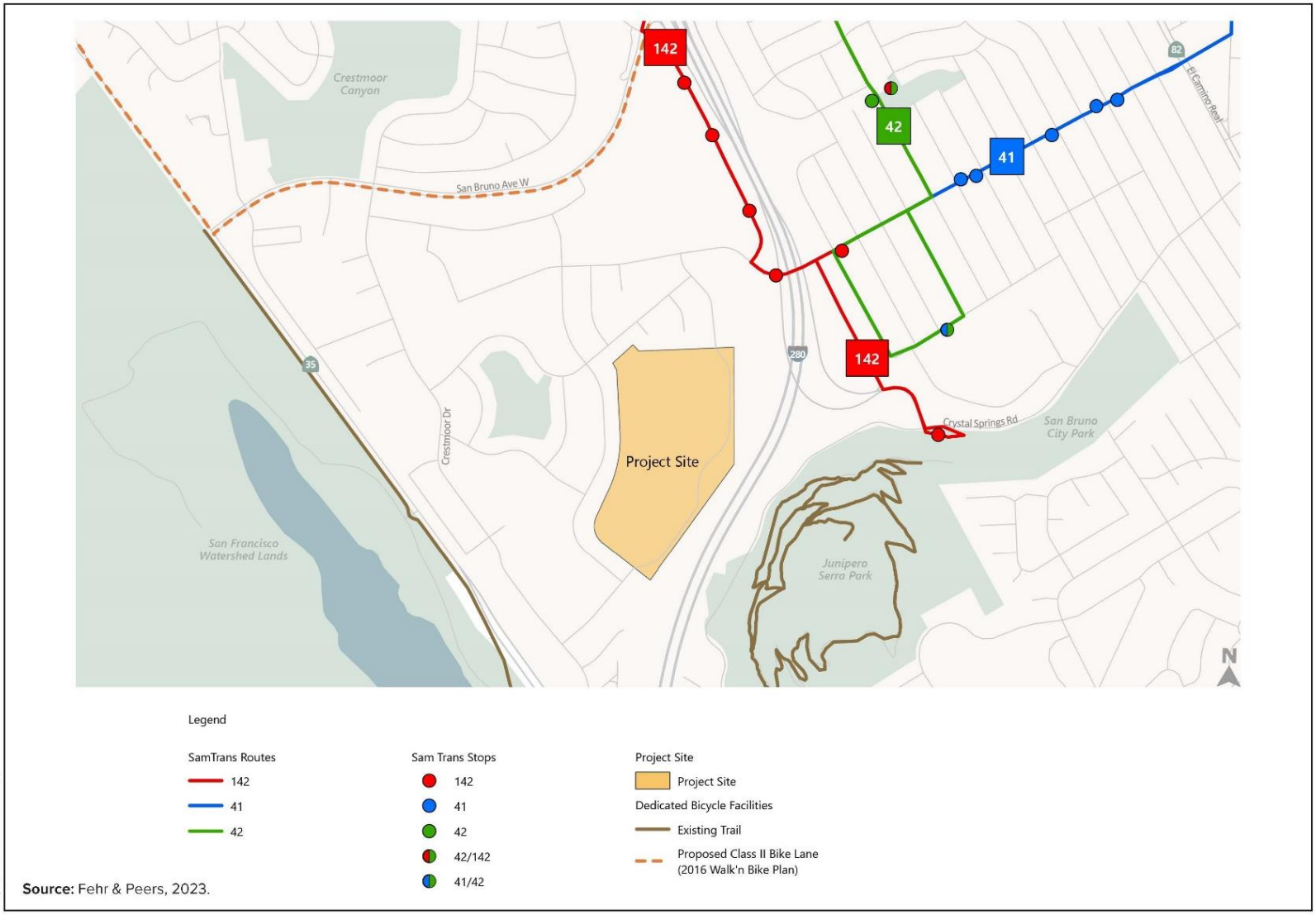


Figure 3.15-2. Transit Routes and Bike Facilities

3.15.2 Environmental Impacts

This section describes the impact analysis related to transportation for the project, describing the methods used to determine the impacts of the project and listing the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as applicable.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant impact if it would result in any of the following conditions.

- Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities.
- Impact TRA-2: Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b).
- Impact TRA-3: Substantial increase in hazards because of a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Impact TRA-4: Potential to cause inadequate emergency access.

Methods for Analysis

Table 3.15-2 defines the analysis scenarios considered in the transportation analysis.

Table 3.15-2. Transportation Analysis Scenarios

Scenario	Description
Scenario 1: Existing Conditions	Existing travel patterns obtained from the San Mateo City/County Association of Governments Travel Demand Model. Existing transportation network conditions obtained from site observations, including records of vehicle counts, roadway and sidewalk conditions, and intersection operations.
Scenario 2a: Existing Plus Project Conditions	Existing Conditions from Scenario 1 adjusted by the project's impact on the transportation network.

Travel Demand

Trip Generation

Vehicle trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Given the location of the site, nearly all trips generated by the project are anticipated to be vehicle trips. Estimates are created for daily trips and for the peak 1-hour during the evening commute period, when traffic volumes on the adjacent residential streets are the highest (ITE Trip Generation Manual 11th Edition).

The type and quantity of land use are the primary inputs to trip generation estimates. The project includes 155 single-family homes. Trip generation associated with homes includes trips made by

residents, visitors, delivery drivers, and home service providers like caregivers and gardeners. There is no current use of the high school, equating to effectively zero existing trips.

The recreation/open space area today serves primarily as soccer fields for two different youth soccer leagues. The proposed modifications would program sports fields and other types of amenities for a similar or reduced level of peak usage compared to what is present today; additionally, only the two youth leagues are known future users of the field. Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. This could result in additional trips to the site at other times of the day and week. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and cannot be further analyzed. Trip generation associated with the recreation/open space area includes trips made by users, spectators, and maintenance and management personnel. Because the number and timing of trips associated with the recreation/open space area is already captured in background trips, the recreation/open space area was not added into the travel demand analysis. The analysis in this EIR represents the level of recreation activity expected, based on existing and past use and is a conservative analysis from a VMT perspective. If fewer sports games were scheduled for the site, VMT associated with the recreation/open space area could be lower than existing levels.

Table 3.15-3 summarizes the weekday and weekend daily and weekday PM peak-hour vehicle trip generation. The focus of the quantitative analysis for this project is on the weekday PM peak hour as that is the busiest time for the surrounding roadways and the time period when a project's impacts are felt most acutely. AM peak background traffic is less congested and project trip generation is less concentrated than in the PM period. The PM peak hour typically occurs between 4:00 p.m. and 6:00 p.m. The weekend peak hour trip generation is also presented given the community interest in traffic conditions surrounding the project site when the recreation fields are typically the busiest.

Table 3.15-3. Vehicle Trip Generation for 155 Single-Family Homes

		PM Peak Hour		
Scenario	Daily	Total	In	Out
Weekday	1,510	150	95	356
Weekend	1,470	145	n/a	n/a

Source: Trip Generation Manual 11th Edition (Institute of Transportation Engineers, 2021)

As shown in Table 3.15-3, the weekday scenario is expected to generate approximately 150 PM peak-hour vehicle trips. The weekend scenario is expected to generate fewer vehicle trips (145 peak hour trips)than the weekday period and is therefore not analyzed further.

Trip Distribution and Assignment

As noted, only the weekday PM peak hour trips are distributed and assigned to the roadway network to represent the worst-case traffic conditions. Vehicle trips were distributed based on travel patterns for other single-family homes in the adjacent neighborhood as observed in the C/CAG-VTA Travel Model. Table 3.15-4 shows the share of trips using each of the primary gateways.

Table 3.15-4. Project Vehicle Trip Distribution – PM Peak

Gateways	Inbound Trips	Outbound Trips
Skyline Boulevard	13%	20%
I-280	44%	43%
Local Roads	43%	37%

Source: C/CAG-VTA Travel Model (C/CAG 2021)

The C/CAG-VTA travel demand model and shortest-travel time calculations in Google Maps were used to determine assignment of trips to the local roadway network. Existing intersection traffic volumes were collected on April 4, 2023. The estimated project trips were then layered on top of the existing volumes to estimate total roadway volumes once the project is built out. The resulting volumes at the transportation study intersections are available in Appendix G, *Transportation*.

Vehicle Miles Traveled Analysis

SB 743 and the resulting State CEQA Guidelines update completed through 2020 replaced the use of LOS for determining transportation impacts with an evaluation of VMT. This EIR incorporates this change and uses VMT findings to make impact determinations later in this document.

VMT Forecast Methodology

VMT forecasts are prepared for this EIR using the C/CAG VMT Estimation Tool, which is based upon a regional travel model that incorporates the regional roadway network and land use profile as inputs. The VMT Estimation Tool uses the San Mateo C/CAG Model because it is optimized for San Mateo County while still accounting for transportation impacts from neighboring counties and regional commute sheds by building off the regional MTC travel demand model. Because VMT thresholds are tied to the region-wide average, a travel forecasting model creates a strong consistency between the threshold setting and project analysis.

VMT is calculated by multiplying the number of trips generated by a project by the total distance of each of those trips. This is typically evaluated for the sum of the lengths of all daily weekday trips and can be reported as Total VMT or as an efficiency metric, such as VMT per Service Population (the sum of the population served by the project including residents and visitors). The efficiency metric of VMT per resident is the focus for this EIR.

VMT per resident was selected as the unit of standardization in this instance because the project is primarily a residential project, and trip generation associated with the recreation area is not anticipated to change substantially from how it operates today. The per-capita metric is standardized based upon the number of residents a project serves, which allows for comparison to a regional average VMT per resident in a way that Total VMT cannot be compared. For this reason, VMT per resident (rather than Total VMT) is used for the transportation impact determinations in this EIR. The VMT analysis omits the recreation and open space areas because there is expected to be little to no change in use of those areas and therefore little to no change in the VMT associated with those uses.

VMT Significance Threshold

The VMT significance threshold used in this EIR is based on the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018). OPR suggests thresholds for

individual land use types. Specifically, OPR suggests using the regional average VMT per resident to benchmark a residential project's VMT performance. It states that VMT per resident for a proposed residential project should be a minimum of 15 percent below the existing regional average VMT per resident to remain less than significant.

Because the City of San Bruno has not adopted separate VMT threshold standards, this EIR uses the OPR-recommended VMT per resident threshold of 15 percent reduction compared to the current regional (nine-county Bay Area) average. Table 3.15-5 presents existing VMT for the region and the 15 percent reduction set for the project's threshold. Based upon the table below, the project would result in a significant impact if the average VMT per resident is greater than 12.4 miles.

Table 3.15-5. Existing Regional Residential VMT and Significance Threshold

Scenario	Existing VMT per Resident	15% Reduction Threshold
Existing Regional Average	14.6	12.4

Source: Appendix G, *Transportation.*

Impacts

Impact TRA-1: Would the project conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities? (Less than Significant)

The project is consistent with both the San Bruno General Plan and the region's SCS, Plan Bay Area 2050. Both the San Bruno General Plan and Plan Bay Area 2050 designate the project site for residential development. The project size is within the scope contemplated by both the San Bruno General Plan and Plan Bay Area 2050.

The project would not interfere with existing or planned San Bruno, county, or state transportation plans. No pedestrian, bicycle, transit, or roadway changes are proposed adjacent to the project site. Public access would continue to be provided on Courtland Drive via a public right of way on Courtland Drive, which also includes areas for recreational supportive uses. The proposed project and project variant would have the same kind of development and the same kinds of transportation impacts. Therefore, the project and project variant present no physical design conflicts and the impact on roadway facilities would be **less than significant**.

Impact TRA-2: Would the project conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b)? (Significant and Unavoidable)

The project would result in a significant impact related to State CEQA Guidelines Section 15064.3, subdivision (b) if it would lead to VMT per resident higher than 15 percent below the existing regional average of 14.6 VMT per resident. This sets the threshold for project-generated VMT per resident at 12.4 VMT, as presented in Table 3.15-5.

Using the C/CAG VMT Estimation Tool, the estimated VMT per resident with the project is estimated to be 14.7 daily miles per resident. This is well above the significance threshold and much closer to the current regional average; therefore, the project would result in a **potentially significant** impact. The project variant, because it has the same amount of residential and recreational uses, would result in the same impact as the proposed project.

Mitigation measure **TRA-2** would require the neighborhood homeowner's association (HOA) to implement a TDM program (see draft plan in Appendix G, *Transportation*) in conjunction with the development application. With implementation of mitigation measure **TRA-2,** alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by the project would be lessened. However, to reduce the project's impact to a less-than-significant level (less than 12.4 VMT per resident), the project would need to reduce its addition of VMT by an additional 16 percent through TDM programs. Studies indicate that implementation of a TDM program for single-family homes in communities with similar transportation and land use context to San Bruno would result in a maximum VMT reduction of approximately 6 percent (CAPCOA 2021). This would not be sufficient to reach a VMT reduction of 16 percent.

The only available onsite TDM strategy deemed applicable and feasible for this project to reduce VMT is trip reduction marketing coordinated by the HOA, which is expected to achieve up to a 4 percent trip (and VMT) reduction below ITE trip generation rates. Other strategies such as electric bike share and car share were considered for this site, but were deemed infeasible at the present time for single-family homes on the project site. Unbundled parking was also considered, but is not infeasible for single-family homes. Many TDM strategies are only applicable at higher densities and when a site has shared facilities like garages, bike rooms, or community rooms. While an HOA could offer transit subsidies, that was determined to be ineffective at the present time in this location given the lack of nearby or high-quality transit options. Finally, reducing the parking supply was also considered for this site but determined to be inconsistent with Municipal Code and limited in its effectiveness given the abundant supply of free neighborhood and recreational parking; therefore, it is not included in the TDM program.

While not currently available as a mitigation option, the City of San Bruno may in the future consider establishing or participating in a VMT mitigation fee, bank, or exchange program that would allow development projects to offset their VMT impacts by contributing money into a citywide program to fund offsite VMT-reducing projects or programs (such as dedicated bike lanes or community shuttles). If such a program were in place at the time of project opening, the project could participate in the program in addition to implementation of a TDM program. If the project participation any such program demonstrated the necessary VMT reduction, participation could be in lieu of a TDM program.

CEQA allows for formulating specific details of a mitigation measure after project approval when it is impractical or infeasible to include those details during the project's environmental review provided that the City:

- Commits itself to the mitigation;
- Adopts specific performance standards the mitigation will achieve; and
- Identifies the types of potential actions that can feasibly achieve that performance standard and that will be considered, analyzed, and potentially incorporated in the mitigation measure.[1]

Therefore, in attempting to reach the performance standard of a per-capita 12.4 VMT, contribution to such a VMT mitigation fee, bank, or exchange program is included as one of the types of potential actions to achieve the performance standard of reducing resident VMT to 12.4 miles per capita, consistent with a 15 percent reduction in VMT from the regional average of 14.6.

[1] State CEQA Guidelines Section 15126.4(a)(1)(B).

Within the nine-county Bay Area, San Mateo County is a good place to build housing from a VMT perspective. Jobs are abundant and thus, commute lengths for people who live in the county are generally shorter than elsewhere in the region. However, the project consists of low-density single-family homes located in a primarily single-use neighborhood with few convenient walking or biking options to access shopping, work, education, or other opportunities. The project is also not located near any high-quality transit lines, nor does it add a mix of land uses or amenities that could reduce the number of vehicle trips or trip lengths for the existing or future residents of the neighborhood. These environmental characteristics result in project trips being made almost exclusively by car, and so, even though trip lengths may be shorter than the regional average, the share of trips made by car (instead of walk, bike, or transit) prevents the site from complying with state goals to reduce VMT below current levels. Therefore, even with mitigation, it is unlikely that the project can achieve 12.4 VMT per resident under Existing Plus Project conditions. Because a VMT mitigation fee, bank, or exchange program does not currently exist, at this time additional mitigation through financial contribution is not feasible. As a result, the VMT impacts associated with the proposed project and the project variant would be **significant and unavoidable**.

Mitigation Measure TRA-2: Implement Transportation Demand Management Program

Prior to the issuance of the first building permit for the residential component of the project, the applicant shall submit to the Community Development Director a TDM program that aims to reduce residential VMT to 12.4 miles per capita, consistent with a 15 percent reduction in VMT from the current regional average of 14.6 miles per capita. At minimum, the TDM program shall include an HOA transportation alternatives marketing program to reduce VMT from the residential component of the project.

The marketing program is expected to achieve up to a 4 percent trip (and VMT) reduction below ITE trip generation rates. Additional measures shall be included in the TDM program that, at the time the TDM program is submitted, are feasible, and appropriate for the residential component of the project, considering the proposed use and its location and size, in an effort to reduce VMT from the residential component of the project as indicated by the performance standard of this mitigation measure (12.4 miles per capita). Other measures that may be considered include but are not limited to, the following.

- Pre-Sale Marketing Program
    - New Owner Trip Reduction Pledge (sales program)
    - Pre-sales Trip Reduction Information
    - New Owner TDM/Trip Reduction Welcome Packet
    - TDM Plan - Purchase Contract/Escrow Disclosures
- Bike Parking Facilities
    - Add Class II bike racks to HOA park
    - Add bike repair fix-it station to HOA park
- Resident Incentive Program
    - Prizes and rewards (bike, carpool, and vanpool)
    - Quarterly promotions

- Voluntary Travel Behavior Change Program (includes Commuter Coordinator, annual survey and reporting)
- Travel Behavioral Intervention (on-site annual event)
- Education, Marketing, and Outreach
- Online HOA Commuter Resource webpage
- Ride-Sharing (carpool matching) Programs (marketing/outreach)
- School Pool Programs (marketing/outreach)
- Onsite E-Bike Subsidy Program

The applicant or HOA, as an alternative means of achieving all or a portion of the VMT reductions, has the option to participate in any adopted applicable VMT mitigation fee, bank or exchange program that would allow development projects to offset project VMT impacts by contributing money into a program to fund offsite VMT reducing projects or programs (such as, but not limited to, dedicated bike lanes, community shuttles, transit service improvements, roadway gap closures, or pedestrian network expansion). To be eligible, the mitigation fee, bank, or exchange program would need to meet the following requirements.

- **Real/verifiable:** Identifies actual projects that would be implemented under the program within a reasonable period of time of the contribution as well as the expected attributable VMT reduction from each project.
- **Additional:** Projects implemented under the program would not be implemented if not for the financial contribution to the program.
- **Measurable/Enforceable:** Contains VMT reduction metrics that provide for conversion of the financial contribution to the program to an equivalent VMT reduction that can be applied to the project.

The applicant shall implement any presale marketing component of the TDM program commencing upon initial marketing activities. The HOA shall implement the balance of the TDM program commencing upon full occupancy of the residential component of the project.

The Community Development Director may approve modifications to the residential TDM plan proposed by the applicant or the HOA that are consistent with the original findings and conditions approved by the review authority. A request to modify the TDM plan may only be granted if it is demonstrated to be at least as effective as the original TDM plan in furthering the transportation goals of the San Bruno General Plan by promoting and increasing transit use, ridesharing, walking, and bicycling to minimize the number of residents traveling in single-occupant vehicles and improving the mobility and general efficiency of circulation and transportation systems by reducing single-occupant vehicle trips and total VMT within the community and the region.

The residential TDM program shall include annual monitoring and reporting requirements completed by a neutral third party on the effectiveness of the onsite component of the TDM program for the first 5 years after full site buildout. The HOA shall submit an annual report documenting the TDM activities undertaken and their results to the Community Development Director. The Community Development Director or designee shall evaluate the overall effectiveness of all of the TDM activities and may suggest new, modified, or substitute activities

that are reasonable, feasible, and appropriate for the residential component of the project, considering the proposed use and its location, to meet the program's objectives.

Annual reporting requirements include information on the TDM marketing program, site occupancy, resident mode share, work-from-home rates, and use of alternative modes. For the first year after full occupancy, the onsite monitoring report must also include a 24-hour screenline vehicle count across all the residential neighborhood street gateways. This count shall be compared to the trip generation estimates prepared as part of the project EIR and will serve as a guidepost for compliance with the 4 percent onsite reduction target. The HOA may need to supplement the marketing program with other measures if initial monitoring results show limited usage of alternative modes and higher than expected trip counts.

Impact TRA-3: Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves, dangerous intersections) or incompatible uses (e.g., farm equipment)? (Less than Significant)

The project would result in a significant impact related to hazardous design if the design of the project or incompatible uses would lead to potentially dangerous interactions between vehicles and other modes or bicycles and other modes.

Design features of the project are consistent with the *California Manual on Uniform Traffic Control Devices* and City standards and Walk 'N Bike Plan policies, all of which focus on eliminating existing hazards and designing the transportation network to enhance safety of all modes of travel. The project adds sidewalks on all internal street frontages and adds or enhances sidewalks for all portions of Courtland Drive immediately adjacent to homes or the recreation area. The project also adds crosswalks across Courtland Drive where they do not exist today. These crosswalks are placed at new three-way stop-controlled intersections at A Street and G Street. These stop signs will moderate driving speeds on Courtland Drive for added safety and visibility. On-street parking is not permitted on Courtland Drive where the internal residential streets intersect, which maximizes site distance and visibility for drivers entering and exiting the site. The design of the new streets—short, lightly curved, and locally serving—will promote slower driving speeds within the project site.

Although the project would add vehicle trips to the surrounding roadways, this general increase in vehicular traffic volumes would be distributed among multiple streets and would not itself be considered a traffic hazard. As shown in the informational LOS analysis (Appendix G, *Transportation*), the addition of this project would add, at most, two additional seconds of delay to nearby intersections. This is because the total number of vehicle trips generated by this project is relatively small compared to the number of trips already using the network and even smaller relative to the vehicle capacity of the surrounding network. In the PM peak hour, the number of vehicles added to the nearest intersections on Courtland Drive is approximately 110—less than two new vehicles per minute. Beyond the primary project gateways on Courtland Drive, most nearby intersections add one or less than one new vehicle per minute in the peak hour. These traffic volume increases pose no safety hazards.

The proposed project and variant would have the same roadway modifications as well as the same level of use. Therefore, the proposed project and project variant would not create potentially hazardous conditions, and impacts related to design hazards would be **less than significant**.

Impact TRA-4: Would the project result in inadequate emergency access? (Less than Significant)

The project would result in a significant impact related to emergency access if it would impair, hinder, or preclude adequate emergency access. The existing roadway network enables emergency vehicle access to all buildings at the project site. Two San Bruno fire stations are located nearby: Station 52 at 1999 Earl Avenue and Central Fire Station at 555 El Camino Real. The Central Fire Station is approximately 1.5 miles, or a 5-minute drive, from the center of the project site. Central Fire Station is approximately 1 mile, or a 5-minute drive, from the center of the project site. The San Bruno Police Department, next to the San Bruno BART Station, is about a 2.5-mile (approximately 10 minute) drive from the center of the project site.

With implementation of the project, emergency access routes would remain similar to existing conditions. The project does not propose any street network changes to the existing network that would impact emergency vehicle access, and all new internal residential streets are wide enough for fire access. Two common area parcels located along the western portion of the developed site would provide access for the fire department to the natural open space parcel and for ongoing maintenance and site safety. The addition of project vehicle trips to the surrounding network does not produce any hazardous queues, and thus project trips are not expected to result in delay to emergency vehicles. Courtland Drive would be closed during project construction. This is not a concern for emergency access because a parallel route (Rosewood Drive plus Madison Avenue) offers nearly the same travel time to get between Courtland Drive's two endpoints.

The proposed project and project variant would have the same impacts related to the temporary closure of Courtland Drive and the ultimate configuration of roadways. Therefore, the proposed project and project variant would not result in inadequate emergency access, and emergency access impacts would be **less than significant**.

3.16 Tribal Cultural Resources

This section evaluates the project's potential environmental impacts on tribal cultural resources. It first describes the existing tribal cultural resources and background of the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.16.1 Existing Conditions

Regulatory Setting

This section discusses the local, state, and federal policies and regulations that are relevant to the analysis of tribal cultural resources issues of the proposed project and variant being considered by the City of San Bruno.

Public Resources Code

Archaeological, paleontological, and historical sites are protected under a variety of state policies and regulations, as enumerated under the California Public Resources Code (PRC). Tribal cultural resources, which are recognized as nonrenewable resources, receive additional protection under the California Environmental Quality Act (CEQA).

- PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet the listing criteria of the National Register of Historic Places (NRHP), including significant tribal cultural resources. It further specifically requires the California Department of Transportation to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer before altering, transferring, relocating, or demolishing state-owned historical resources that are listed or eligible for listing in the NRHP or registered or eligible for registration as California Historical Landmarks.
- PRC Sections 5097.9 to 5097.991 provide protection to Native American historical and cultural resources as well as sacred sites. These sections also identify the powers and duties of the Native American Heritage Commission (NAHC) and require notification of descendants when Native American human remains are discovered. They also provide for the treatment and disposition of human remains and associated grave goods.
- PRC Section 21084.2 outlines the key points of Assembly Bill (AB) 52 (Chapter 532, Statutes of 2014), which establishes a formal consultation process for California Native American tribes as part of the California Environmental Quality Act (CEQA). This section equates significant impacts on tribal cultural resources with significant environmental impacts.

Assembly Bill 52

Tribal cultural resources were originally identified as a distinct CEQA environmental category with the adoption of AB 52 in September 2014, which was codified into the PRC. AB 52 requires the lead agency on a proposed project to consult with the geographically affiliated California Native

American tribes. The legislation creates a broad new category of environmental resources, *tribal cultural resources*, which must be considered under CEQA. AB 52 requires a lead agency to not only consider the resource's scientific and historical value but also whether it is culturally important to a California Native American tribe.

AB 52 defines *tribal cultural resources* as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are included in or determined to be eligible for inclusion in the California Register of Historical Resources (CRHR); included in a local register of historical resources, as defined in PRC Section 5020.1(k); or determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to the criteria of PRC Section 5024.1(c). (PRC Section 21074)

The following CRHR criteria for the listing of resources are defined in PRC Section 5024.1(c).

1. The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. The resource is associated with the lives of persons important in our past.
3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
4. The resource has yielded, or may be likely to yield, information important in prehistory or history.

AB 52 also sets up an expanded consultation process. Lead agencies are required to provide notice of their proposed projects to any tribe that is traditionally and culturally affiliated with the geographic area and that requested to be informed by the lead agency, following PRC Section 21080.3.1(b). If, within 30 days, a tribe requests consultation, the consultation process must begin before the lead agency can release a draft environmental document. Consultation with the tribe may include a discussion regarding the type of review necessary, the significance of tribal cultural resources, the significance of the project's impacts on the tribal cultural resources, and alternatives and mitigation measures recommended by the tribe. The consultation process is deemed concluded when either (1) the parties agree to mitigation measures or (2) any party concludes, after a good-faith effort, that an agreement cannot be reached. Any mitigation measures agreed to by the tribe and lead agency must be recommended for inclusion in the environmental document. If a tribe does not request consultation, or to otherwise assist in identifying mitigation measures during the consultation process, a lead agency may still consider mitigation measures if the agency determines that a project will cause a substantial adverse change to a tribal cultural resource.

Senate Bill 18

The intent of Senate Bill (SB) 18 is to aid in the protection of traditional tribal cultural places through local land use planning by requiring city governments to consult with California Native American tribes on projects that include adoption or amendment of general plans (defined in Government Code Section 65300 et seq.) and specific plans (defined in Government Code Section 65450 et seq.). SB 18 requires local governments to consult with tribes prior to making certain planning decisions and to provide notice to tribes at certain key points in the planning process.

Health and Safety Code Section 7050.5: Human Remains

Section 7050.5 of the California Health and Safety Code states that, in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the NAHC within 24 hours of this identification.

Public Resources Code Section 5097.98: Notification of Most Likely Descendant

PRC Section 5097.98 states that the NAHC, upon notification of the discovery of Native American human remains pursuant to Health and Safety Code Section 7050.5, shall immediately notify the most likely descendant of the deceased. With permission of the landowner or a designated representative, the most likely descendant may inspect the remains and any associated cultural materials and make recommendations for treatment or disposition of the remains and associated grave goods. The most likely descendant shall provide recommendations or preferences for treatment of the remains and associated cultural materials within 48 hours of being granted access to the site.

California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act (California Health and Safety Code Section 8010 et seq.) establishes a state repatriation policy consistent with, and facilitates implementation of, the federal Native American Graves Protection and Repatriation Act (which does not apply to the project because it is not on federal or tribal land). The act strives to ensure that all California Native American human remains and cultural items are treated with dignity and respect, and asserts intent for the state to provide mechanisms for aiding California Native American tribes, including nonfederally recognized tribes, in repatriating remains and cultural items.

Environmental Setting

As discussed below, no tribal cultural resources were identified within the project area. Additional information about the existing environmental setting, ethnographic lifeways, and the postcontact history of Native Americans who traditionally inhabited the vicinity of the project area is provided in Section 3.4, *Cultural Resources*.

3.16.2 Environmental Impacts

Methods for Analysis

This section describes the impact analysis related to tribal cultural resources for the proposed project and variant. The evaluation of cultural resources is based on professional standards and information cited throughout the section. It describes the methods and thresholds used to determine whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as applicable.

Although it is foreseeable that the existing athletic leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the

future, thereby potentially increasing use of the facilities. There would be no additional impact because intensity and frequency of use are not associated with impacts to tribal cultural resources. Therefore, the potential for increased use, which is currently undefinable, is not analyzed further.

Archaeological Resources in the Project Area

ICF conducted a record search on May 23, 2023, at the Northwest Information Center (NWIC) in Rohnert Park, California—a part of the California Historic Resource Information System—to identify the presence of previously recorded archaeological resources, including those potentially considered tribal cultural resources. No archaeological resources were identified within the project site, and two previously recorded archaeological resources were identified within 0.25 mile of the project site. Both resources (P-41-000096, P-41-000098) are prehistoric shell middens, and one of them contained human remains.

Additionally, the results of previous cultural resources investigations, including one conducted by ESA (2022) were reviewed in detail. ESA also conducted archival research at the NWIC in Sonoma County on May 9, 2022 (File No. 21-1814.), reviewed the information regarding existing conditions in the project area, and reviewed project maps and the surrounding topography to independently assess the sensitivity for the presence of cultural resources within the project area.

Native American Consultation

To determine sensitivity for Native American resources within the project area, consultation with NAHC and local Native American groups was conducted. The NAHC was contacted on June 1, 2023, with a request for the following information.

- CEQA Tribal Consultation List (AB 52).
- Identification by NAHC of any Native American resources within the subject lands that are listed in the Sacred Lands File.

A response from NAHC was received on June 27, 2023, that stated that a search of the Sacred Lands File was positive with one resource. NAHC recommended that ICF contact the following tribal representatives for more information about this resource.

- Irenne Zwierlein, Amah Mutsun Tribal Band San Juan Bautista.
- Desiree Vigil, The Ohlone Indian Tribe.

On July 3, 2023. ICF called Ms. Zwierlien and Ms. Vigil and left messages requesting more information about the tribal cultural resource. A follow up letter requesting information was sent on July 12, 2023. No response has been received.

Although no tribe has formally requested notice under AB 52, the City of San Bruno sent letters to the following individuals to invite them to initiate consultation under AB 52 if desired and to invite them to initiate consultation under SB 18.

- Monica Arellano, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area.
- Charlene Nijmeh, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area.
- Tony Cerda, Costanoan Rumsen Carmel Tribe.

- Kenneth Woodrow, Wuksache Indian Tribe/Eshom Valley Band.
- Ann Marie Sayers, Indian Canyon Mutsun Band of Costanoan.
- Irenne Zwierlein, Amah Mutsun Tribal Band San Juan Bautista.
- Rosemary Cambra, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area.
- Andrew Galvan, The Ohlone Indian Tribe.

The City of San Bruno mailed certified letters via priority mail on April 7 and 8, 2023. The letter to Kenneth Woodrow was initially returned, so a letter with the corrected address was sent out and delivered to him on May 11, 2023. No responses were received from any of the contacts within the periods during which they can request consultation (90 days for SB 18, 30 days for AB 52).

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project and variant would be considered to have a significant impact if it would result in any of the following conditions.

- Impact TCR-1: Potential to cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the CRHR or in a local register of historical resources as defined in Public Resources Code section 5020.1(k).
- Impact TCR-1: Potential to cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Impacts and Mitigation Measures

Impacts TCR-1 and TCR-2: Would the project cause a substantial adverse change in the significance of a tribal cultural resource that is (a) listed or eligible for listing in the CRHR or in a local register of historical resources, as defined in PRC Section 5020.1(k), or (b) determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1? (Less than Significant with Mitigation)

The records search conducted at the NWIC did not identify any previously recorded archaeological resources within the project site; nor did any tribes provide information about tribal cultural resources. However, the presence of two precontact midden deposits, one of which contained Native American human remains, within 0.25 mile of the project site indicates increased potential for encountering as-yet undocumented tribal cultural resources deposits during project-related ground disturbance. This impact would be **potentially significant** for both the proposed project and

variant. Under the proposed project and variant, implementation of mitigation measures CULT-2a and CULT-2b (as described in Section 3.4) would reduce the impacts on tribal cultural resources to a **less-than-significant** level.

MM-CUL-2a: Conduct Cultural Resource Awareness Training Prior to Project-Related Ground Disturbance and Stop Work if Archaeological Deposits are Encountered During Ground-Disturbing Activities.

MM-CUL-2b: Stop Work if Buried Cultural Deposits are Encountered During Construction Activities.

3.17 Utilities and Service Systems

This section describes the environmental and regulatory setting for utilities and service systems in the City of San Bruno. It first describes the existing utilities that serve the project area and identifies the state and local plans, policies, and regulations applicable to the project. It also describes the utilities and service systems impacts, if any, that would result from implementation of the project, including both the residential and recreational components.

3.17.1 Existing Conditions

Regulatory Setting

Federal

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established under the Clean Water Act (CWA) to regulate municipal and industrial discharges to surface waters of the United States. NPDES permit regulations have been established for broad categories of discharges including point source waste discharges and nonpoint sources. NPDES permits cover various industrial and municipal discharges, including discharges from storm sewer systems in larger cities, stormwater generated by industrial activity, runoff from construction sites disturbing more than 1 acre, and mining operations. Point source dischargers must obtain a discharge permit from the proper authority (usually a state, sometimes the Environmental Protection Agency [EPA], a tribe, or a territory). So-called "indirect" point source dischargers are not required to obtain NPDES permits. "Indirect" dischargers send their wastewater into a public sewer system, which carries it to the municipal sewage treatment plant, through which it passes before entering any surface water. Wastewater treatment for San Bruno is handled under a Joint Powers Agreement with the City of South San Francisco. Approximately 3.4 million gallons of effluent per day are pumped from San Bruno through the Shaw Road Pump Station to be treated at the South San Francisco/San Bruno Water Quality Control Plant.

The Municipal Stormwater Permitting Program regulates stormwater discharges from municipal separate storm sewer systems (MS4s). Stormwater is runoff from rain or snow melt that runs off surfaces such as rooftops, paved streets, highways, or parking lots and can carry with it pollutants such as oil, pesticides, herbicides, sediment, trash, bacteria, and metals. The runoff can then drain directly into a local stream, lake, or bay. Often, the runoff drains into storm drains, which eventually drain untreated.

State

Urban Water Management Planning Act

California State Assembly Bill (AB) 797 (California Water Code Section 10610, et. seq.), adopted in 1983, requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or providing more than 3,000 acre-feet of water on an annual basis prepare an Urban Water Management Plan (UWMP). The intent of the UWMP is to assist water supply agencies

in long-term water resource planning given their existing and anticipated future demands. UWMPs must be updated every 5 years in years ending in 0 and 5 (DWR 2010).

Senate Bill 610

Senate Bill (SB) 610 requires that certain large projects subject to the California Environmental Quality Act (CEQA) prepare a specified Water Supply Assessment (WSA) (DWR 2003). The WSA must be furnished to the local government for inclusion in any environmental documentation for certain projects (as defined in Water Code 10912[a]) subject to CEQA. This legislation also expands the requirements for certain types of information in a UWMP, including an identification of any existing water supply entitlements, water rights, or water service contracts held relevant to the WSA for a proposed project, and a description of water deliveries received in prior years.

State CEQA Guidelines Section 15155 requires preparation of a WSA when a project is of sufficient size to be defined as a "water-demand project." A water-demand project is a large-scale construction project, such as a residential development of more than 500 dwelling units; a shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; or a commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space. The proposed project does not meet the criteria defined as a water-demand project and does require the preparation of a WSA.

Under SB 221, approval by a city or county of residential subdivisions of 500 dwelling units or more requires a written verification of sufficient water supply from the water supplier; however, the proposed project includes less than 500 units, and, therefore, SB 221 does not apply.

California Integrated Waste Management Act

The California Integrated Waste Management Act (IWMA), AB 939, passed in September 1989, requires every city and county in the state to prepare a Source Reduction and Recycling Element with its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory state diversion goals of 25 percent by 1995 and 50 percent by 2000 (CalRecycle 2023). The intent of AB 939 is to facilitate solid waste reductions, recycling, and reuse to the greatest extent possible. The bill imposes fines of up to $10,000 per day on cities and counties for noncompliance in meeting the goals and timelines set forth in AB 939.

CALGreen

CALGreen is California's first green building code and first in the nation state-mandated green building code. It is formally known as the California Green Building Standards Code, Title 24, Part 11, of the California Code of Regulations. The purpose of CALGreen is to improve public health, safety, and general welfare through enhanced design and construction of buildings using concepts that reduce negative impacts and promote those principles that have a positive environmental impact and encourage sustainable construction practices. CALGreen was adopted to address the five divisions of building construction: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality (Sustainable Investment Group, 2019). The City adopted the 2022 California Building Code by reference.

Regional

San Francisco Public Utility Commission Right-of-Way Policies

The San Francisco Public Utility Commission (SFPUC) owns and manages land and water system infrastructure for its own exclusive use that is part of the Hetch Hetchy Regional Water System. The primary use of SFPUC lands and easements is for the delivery, operation, maintenance and protection of water, power, and sewer systems. The SFPUC has adopted guidelines to help inform how and in which instances the easements can serve the needs of public agencies, private parties, nonprofit organizations, and developers, while maintaining the safety and security of the SFPUC pipelines. SFPUC guidelines pertain to land use and structures, recreational use, utilities, vegetation, and water efficiency. The easements also are subject to terms and restrictions regarding use of land contained in the original deeds granting the easements to the SFPUC. There is an existing SFPUC pipeline approximately northeast from the existing unoccupied high school building, but it would remain in place as part of the proposed project.

Water System Improvement Program

SFPUC's Water System Improvement Program (WSIP) was approved on October 31, 2008, with the purpose of improving the delivery reliability of the Regional Water System (RWS) that is operated by SFPUC. The following objectives of the WSIP are related to water supply.

- Meet average annual water demand of 265 million gallons per day (mgd) from the SFPUC watersheds for retail and wholesale customers during nondrought years for system demands consistent with the 2009 Water Supply Agreement.
- Meet dry-year delivery needs while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts.
- Diversify water supply options during nondrought and drought periods.
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

The WSIP provides benefits to the City by improving the reliability of wholesale water purchased from SFPUC, especially during periods of drought. The program aims to meet customer water needs in nondrought and drought conditions and provides dry-year water supply projects to augment all year type water supplies during drought. The overall completion date for the WSIP was May 5, 2023 (SFPUC 2023).

Regional Groundwater Storage and Recovery Project

In December 2014, the Regional Groundwater Storage and Recovery (GSR) Project operating agreement was signed to ensure long-term management and sustainability of the South Westside Groundwater Basin through a strategic conjunctive use partnership. The partnership with the City of San Bruno, SFPUC, California Water Service (serving South San Francisco and Colma), and the City of Daly City allows the agencies to operate the basin jointly and provides a new 20-billion-gallon regional dry year groundwater supply. The project is included as part of the SFPUC WSIP. The City implemented conjunctive use operations starting in 2016.

The Regional GSR Project is an in-lieu groundwater recharge program that balances groundwater and the SFPUC RWS to increase drought year water supplies. Under the Regional GSR Project, the

City operates under two supply modes that vary according to hydrologic conditions. During wet and normal years ("put" operations), SFPUC provides additional surface water to the City to reduce the City's groundwater pumping. The additional supply is stored in the South Westside Basin as groundwater until it is needed during a drought or emergency. During dry years ("take" operations), the City utilizes available groundwater supplies and reduces surface water deliveries, thereby freeing surface water supply to be delivered to other SFPUC customers.

Bay Delta Plan Amendment

In December 2018, the State Water Resources Control Board (State Water Board) adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, establishing water quality objectives to maintain the health of the state's rivers and the Bay-Delta ecosystem (the Bay-Delta Plan Amendment) (State Water Board 2019). The State Water Board had stated that it intended to implement the Bay-Delta Plan Amendment by 2022, assuming all required approvals are obtained by that time. Implementation of the Bay Delta Plan Amendment will result in a substantial reduction in the City's SFPUC water supplies from the Tuolumne River watershed during dry years, requiring rationing in the City to a degree greater than that previously anticipated to address supply shortages that were not accounted for in the 2015 UWMP. However, the 2020 UWMP accounts for the Bay Delta Plan Amendment.

In a letter dated July 31, 2019, from the SFPUC Director of Water Resources to the Bay Area Water Supply & Conservation Agency (BAWSCA) Water Resources Manager, SFPUC provided a memorandum titled *Water Supply Reliability Information for BAWSCA Member Agencies Water Supply Assessments (with Corrections*) (Reliability Memorandum). This Reliability Memorandum states that implementation of the Bay-Delta Plan Amendment is uncertain for several reasons (City of San Bruno 2021).

- **First:** Under the Clean Water Act, EPA must approve the water quality standards identified in the Bay-Delta Plan Amendment within 90 days from the date the approval request is received. By letter dated June 11, 2019, EPA rejected the State Water Board's two-page submittal as inadequate under the requirements of the Clean Water Act. Pursuant to EPA's letter, the State Water Board had 90 days to respond with a submittal that complies with the law. At the time the letter was written, EPA had neither approved, nor disapproved, any of the revised water quality objectives. It is uncertain whether the EPA will approve or disapprove the water quality standards in the future. Furthermore, the determination could result in litigation.
- **Second:** Since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal court, challenging the State Water Board's adoption of the Bay-Delta Plan Amendment, including two legal challenges filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation in state and federal courts. These cases are in the early stage and there have been no dispositive court rulings to date.
- **Third:** The Bay-Delta Plan Amendment is not self-implementing and does not allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, the 401 certification process in the Federal Energy Regulatory Commission's (FERC) relicensing proceeding for Don Pedro Dam. The license amendment process is currently expected to be completed in 2023. This process and the other regulatory and/or adjudicatory proceedings

would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).

- **Fourth:** In recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, State Water Board Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the State Water Board "as early as possible after December 1, 2019." In accordance with the State Water Board's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the State Water Board ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, SFPUC adopted Resolution No. 19-0057 to support SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency and California Environmental Protection Agency and the leadership of the Newsom administration. The negotiations for a voluntary agreement have made significant progress since an initial framework was presented to the State Water Board on December 12, 2018. The package submitted on March 1, 2019, is the product of renewed discussions since Governor Newsom took office. While significant work remains, the package represents an important step forward in bringing together diverse California water interests.

Since that letter, the State Water Board received in November 2022 a memorandum of understanding regarding a Tuolumne River Voluntary Agreement. The State Water Board has to consider modifications to the Bay-Delta Plan because the Voluntary Agreement would not conform to its provisions. A Notice of Preparation of Environmental Documentation and Scoping Meeting for Possible Amendment of the Bay-Delta Plan to Incorporate Voluntary Agreement for the Tuolumne River was issued in April 2023 (State Water Board 2023). This further indicates that implementation of the amendment is uncertain.

San Mateo Countywide Stormwater Pollution Prevention Program

The City of San Bruno is 1 of 20 participating cities in the San Mateo Countywide Water Pollution Prevention Program, which manages a shared NPDES permit utilized by all participating agencies (City/County Association of Governments of San Mateo County 2023). The Program ensures that participating jurisdictions manage stormwater runoff flows such that contaminated water runoff and discharge into waterbodies is minimized. The program accomplishes this by directing construction projects, municipal operations, and other potential stormwater sources countywide to incorporate appropriate Low-Impact-Development (LID) measures that contain, filter, and treat stormwater prior to discharge. The City of San Bruno administers stormwater quality protection through the C.3 Municipal Regional Stormwater Permit (MRP), which is issued under NPDES and by the Regional Water Quality Control Board (Regional Water Board) through this program.

Local

Sanitary Sewer Management Plan

The City of San Bruno Sewer System Management Plan is a comprehensive planning document that describes the policies and procedures required to maintain compliant sewer services citywide (City of San Bruno 2019a). These policies help fulfill San Francisco Bay Regional Water Board water

quality and sewer management requirements and to prevent sanitary sewer overflows and maintain water quality. Generally, goals and policies described in the Sanitary Sewer Management Plan pertain to maintaining adequate sanitary sewer conveyance and treatment capacity minimizing sewer overflow incidents, and preventing illicit discharges including contaminated stormwater chemicals, debris, fats and oils.

2020 Urban Water Management Plan

The City of San Bruno 2020 Urban Water Management Plan (West Yost Associates 2021) provides both current and future water supply planning guidance and implementation strategies citywide in accordance with Regional Water Board requirements and with the Urban Water Management Planning Act (AB 797). The UWMP is intended to preserve water resources in San Bruno to ensure sufficient water supplies and adequate water quality in the City based on catalogued and projected water use data and the City's Individual Supply Guarantee (ISG), the amount of SFPUC-provided surface water resources that are guaranteed for purchase. Relevant to the potential Bay-Delta Amendment, the Urban Water Management Plan notes:

> A new constraint on SFPUC supply, as of 2023, is the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment). The implementation of the Bay-Delta Plan Amendment comes with uncertainty due to pending lawsuits and efforts to have the State Water Resources Control Board adopt the Tuolumne River Voluntary Agreement, as part of a Global Voluntary Agreement package. As presented by SFPUC and BAWSCA, the impacts of the Bay-Delta Plan Amendment will be significant (more than 50 percent cut back possible) in multiple drought years for wholesale customers of the RWS.

Storm Drain Master Plan

The City of San Bruno Storm Drain Master Plan guides storm drain infrastructure planning to help reduce overall storm drain runoff and localized flooding risks, with special consideration for site topography, drainage patterns, and system capacity limitations (City of San Bruno 2014). The Storm Drain Master Plan identifies the storm drain system currently serving the project site as consisting of underground pipes, box culverts, and channels.

City of San Bruno Green Infrastructure Plan

The City of San Bruno Green Infrastructure Plan (City of San Bruno 2019b), approved in August 2019 as a requirement of the State MRP, guides sustainable development in the City, with a focus on converting the City's public property and public right-of-way from a traditional "grey" infrastructure system, in which stormwater flows across impervious surfaces directly into storm drains, to an integrated approach that will direct runoff to vegetated areas for LID stormwater treatment infiltration. The plan intends to identify and prioritize LID opportunities citywide in which such stormwater management infrastructure can be installed in the form of bioretention areas, stormwater tree well filters, suspended pavement systems, pervious pavement, infiltration facilities, green roofs, and rainwater harvesting facilities. Environmental Setting

Water Supply and Demand

The City currently uses water from the following sources.

- Wholesale treated surface water from the City and County of San Francisco's RWS, operated by the SFPUC, served through four connections to the City's system.

- Retail treated surface water purchased from the North Coast County Water District (NCCWD).
- Local groundwater from the Westside Groundwater Basin.

In recent years, approximately 90 percent of the City's water supply has been from the SFPUC and NCCWD. San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent wholesale customers collectively. The City's ISG of that total is 3.25 mgd. Water purchased from the NCCWD is also from the RWS, but is delivered to the City via NCCWD's system, and is used exclusively to meet the demands of the Crystal Springs Terrace Apartments. Local groundwater supply for the City is from the Westside Basin, which is used by the Cities of San Bruno, Daly City, and South San Francisco. The City operates multiple production wells that extract groundwater from the central portion of the 40-square-mile Westside Basin (i.e., Basin 2-35, as defined by the State of California Department of Water Resources [DWR]). The City has used groundwater as a source of supply since the early 1900s. Prior to 2016, groundwater use comprised about 50 percent of the City's total water supply. In 2016, the City reduced its use of groundwater in accordance with the Regional GSR Project (West Yost 2021).

Water Distribution System

San Bruno's water system infrastructure consists of 18 booster pumps, 1 filtering plant, 8 storage tanks (with a combined capacity of 8 million gallons), 900 fire hydrants, 9,000 valves, over 100 miles of water mains ranging from 12 inches to 16 inches in diameter, and 11,300 metered services. Much of the distribution system was constructed over 40 years ago before current stringent performance standards were in effect. Assuring compliance with all requirements of the State Department of Health Services, inspection and maintenance of equipment, inspection and treatment of the water supply, and administration of several programs including water conservation and public awareness, are all tasks of the San Bruno Public Works Department's Water Division.

The project's preliminary utility plan shows two connections to the City's existing water system: 1) a new 8-inch connection to the existing 6-inch diameter water main to the north in Courtland Drive, and 2) a new 8-inch connection to the existing 6-inch-diameter water main to the south in Madison Avenue (West Yost Associates 2022). The project is in an area that could be served by either Pressure Zone 6 or Pressure Zone 7 of the City's water system. However, based on the project's proposed service elevations and the hydraulic gradients of these pressure zones, it is recommended that the project be served by Zone 6. Tank 3 – Glenview Drive serves Zone 6, which is supplied from Zone 2 via PS3 – Whitman Way and PS7 – San Bruno Avenue.

Stormwater

The existing project site can be divided into four drainage areas, as shown in Figure 3.9-1 (Hansen 2023).

- **Area 1.** School, playing fields, landscape and private roadways: stormwater is collected through a private storm drain system and conveyed to the northwest corner of the property where it goes into a field inlet and is discharged into an existing system along Keefe Court (the storm drain on Keefe Court is a public storm drain, while the storm drain between the project site and Keefe Court is not owned or maintained by the City).
- **Area 2**. Hillside landscape on the eastern side of Courtland Drive: sheet flows east down the hillside toward Interstate 280.

- **Area 3.** Western vegetated hillside: sheet flows towards the Crestmoor Park subdivision, where surface stormwater is collected in public utility easement drainage with a concrete v-ditch and conveyed to the public storm drain system along Madison Avenue.
- **Area 4.** Northeast corner of the property with a partial existing driveway, landscape, and a portion of Courtland Drive: sheet flows to Courtland Drive and flows north outside the property to a storm drain system on Courtland Drive.

Wastewater

The City's Public Works Department's Wastewater Division is responsible for the wastewater collection system and assures compliance with all permit requirements for EPA, the State Water Board, the Regional Water Board, County Health Mandates, and the NPDES. The sanitary sewer system consists of approximately 150 miles of pipeline and seven lift stations. Currently, 3.4 million gallons of effluent per day (mgd) from San Bruno goes to the South San Francisco-San Bruno Water Quality Control Plant (SSF/SB WQCP) that the City of San Bruno owns jointly with the City of South San Francisco (City of San Bruno n.d.). The City estimates average discharges of 75 gallons per day per capita for residential users, 1,000 gallons per day per acre for commercial use, and 2,000 gallons per day per acre of industrial use.

The average dry weather flow through the facility as of 2022 is approximately 7 mgd. Design capacity is 13 mgd with dry flows averaging 7 mgd. Peak wet weather flows can exceed 60 mgd, exceeding design capacity. The per capita flow rate over the last 10 years has averaged 79 gallons per capita per day (City of South San Francisco 2022). To accommodate peak wet-weather flows, the SSF/SB WQCP is in the process of conducting facility improvements, which would include installation of a new storage basin to retain excess flows during wet-weather conditions (City of San Bruno 2022). During the wet season, infiltration/inflow into the City's wastewater system also has been a continuing problem because wet-weather flow can cause collection system overflows. As part of settlement of a lawsuit by San Francisco Baykeeper regarding sanitary sewer overflows as well as an order from the San Francisco Regional Water Board, the City had to limit maximum sanitary overflows to eight under the Regional Water Board agreement and a maximum of three under the Baykeeper agreement (City of San Bruno 2019a).

Energy

Peninsula Clean Energy (PCE) is San Mateo County's default electricity provider. Individuals can opt out of PCE and switch to Pacific Gas and Electric Company (PG&E) service at any time, but PCE is the county's default provider, and their rates are lower or comparable to PG&E, depending on the selected PCE rate plan (PCE 2023). Therefore, it is reasonably presumed that they would be the provider for the proposed project. PCE provides electricity to the city of San Bruno, including the project site. Their power comes from a mix of various sources, including solar, wind, geothermal, biomass and biowaste, and hydroelectric generation resources. PCE delivers power to its customers via existing PG&E utility infrastructure. PG&E obtains its energy supplies from power plants and natural gas fields in northern California and from energy purchased outside its service area and delivered through high voltage transmission lines. Electrical power is provided to the City from eight different distribution feeders, and natural gas is provided by PG&E from three gas lines stretching from Milpitas to San Francisco. According to PG&E, residential uses comprise the majority of energy loads in San Bruno because the City has very few large commercial or industrial customers.

The eight different distribution feeders that provide electrical power to San Bruno are four feeders from the Sneath Lane substation in San Bruno, two feeders from the East Grand substation in South San Francisco, one fed from the Airport substation, and one originating from the Millbrae substation in Millbrae. Most of these feeders also serve other cities, including Pacifica, Millbrae, and South San Francisco, and are linked to other distribution feeders, assuring greater reliability. Natural gas is delivered from basins in Canada and/or Texas by transmission mains and deposited at PG&E's Milpitas Gas Terminal. PG&E has existing easements on and near the project site to transmit natural gas and electricity to the site.

Solid Waste

Recology San Bruno provides solid waste disposal services citywide, including garbage, recycling, and organic composting services (CalRecycle2019a). Recology San Bruno transports solid waste to the San Bruno Transfer Station at 101 Tanforan Avenue, where solid waste is processed, treated, and transported to other disposal facilities. The San Bruno Transfer Station has a maximum permitted capacity of 768 tons of solid waste per day (CalRecycle 2019a).

In 2022, the City of San Bruno generated 29,137 tons of solid waste, with residents generating approximately 3.8 pounds of solid waste per capita per day and employees generating 11.1 pounds of solid waste per capita per day (CalRecycle 2019b). Per capita solid waste generation in the city has decreased over time due to numerous waste diversion programs, including source reduction, recycling, composting, incentivization, and public education initiatives (CalRecycle 2019c).

Telecommunication Services

The City of San Bruno is served by both wired and cellular telecommunications providers. City Net Services (formally San Bruno Cable TV) and AT&T California provide the City with wired telecommunications services. Mobile cellular service, including mobile data, is provided by major carriers including Verizon Wireless, T-Mobile, Sprint, and AT&T.

3.17.2 Environmental Impacts

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project would be considered to have a significant impact if it would result in any of the following conditions.

- Impact UT-1: Relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, with the potential to cause significant environmental effects.
- Impact UT-2: Creation of a need for new or expanded entitlements or resources for sufficient water supply to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.
- Impact UT-3: A determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

- Impact UT-4: Generation of solid waste in exceedance of state or local standards or in excess of the capacity of local infrastructure, or other impediment to the attainment of solid waste reduction goals.
- Impact UT-5: Failure to comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Methods for Analysis

Utilities and service systems impacts associated with construction and operation of the project were assessed and quantified, where applicable, using standard and accepted software tools and techniques. The utilities and service systems impact analysis considers whether proposed project implementation would result in substantial impacts on utilities systems due to either construction or operational circumstances. Impacts could include exceedances of existing system capacity, a need to expand utilities systems to meet future needs with project implementation, or supply availability impacts, such as potential project-related exceedances of available water resources. Potential project-related impacts on utilities and service systems were evaluated based on existing capacity and demand data identified in the West Yost Hydraulic Evaluation and Woodard & Curran Sanitary Sewer Capacity Evaluation Report, as well as from site plans and publicly available sources.

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. In such a scenario, there may be incremental increases in utility use. Lights may be on more often and increase energy consumption, there may be more incidental water use and wastewater generation at the restrooms and snack shack, and there may be more trash generation. However, at this time, the City has no certain future users and therefore the parameters and characteristics of this additional use (e.g., intensity, time of day, day of week) cannot be defined at this time and cannot be further analyzed.

Impacts and Mitigation Measures

Impact UT-1: Would the project require or result in relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, with the potential to cause significant environmental effects? (Less than Significant with Mitigation)

Construction

Under the proposed project, utility infrastructure would be constructed on the project site. For example, the residential component of the proposed project includes construction of a large bioretention area and a new storm drain line, and the recreational component would also require its own utility infrastructure. The new storm drain line for the residential component would connect to the existing private line that connects to Keefe Court within a private storm drain easement through the dedicated public open space. These components are considered part of the proposed project; therefore, impacts of construction of these project elements are addressed throughout the EIR by resource area.

Stormwater

Construction-related activities could potentially increase runoff events and degrade water quality (Section 3.9, *Hydrology and Water Quality*). During construction the contractor would adhere to NDPES Permit requirements, implement best management practices (BMPs) to minimize runoff, adhere to the City's Stormwater Ordinance, and prepare a Stormwater Pollution Prevention Plan (SWPPP). This would reduce stormwater runoff and address water quality.

Wastewater Treatment and Sanitary Sewer Collection System

Wastewater would be generated by construction activities, and portable restrooms would be temporarily installed on site. Construction is not anticipated to result in substantially elevated wastewater generation levels into the local sanitary sewer system. No new wastewater treatment would be needed.

Electricity

Minor construction equipment, such as handheld electric power tools, would result in an extremely small increase in energy demand that would occur over a short period of time. Construction of the variant would be similar to construction of the proposed project. There would not be a substantial increased demand for electrical power during construction under the proposed project or project variant.

Natural Gas

Project construction would utilize typical construction equipment (e.g., scraper/blade, backhoes) powered by gasoline or diesel fuel and would not require the use of natural gas. No new natural gas infrastructure would be needed for construction of the proposed project or project variant.

Operation

Stormwater

As discussed under Impact WQ-3 in Section 3.9, the preliminary findings regarding stormwater drainage found that there would be an increase in stormwater runoff by about 2.26 cubic feet per second in one drainage area (Hansen 2023). As part of the project, stormwater would be conveyed from multiple points across the residential area and conveyed into a bioretention area in a private storm drain easement within the dedicated open space. The stormwater treatment basins and onsite detention would be sized to contain the runoff so that it would be at a minimum at existing conditions or below them for a 25-year storm. It would be treated through filtering in the bioretention basin before being discharged into the existing storm drain system via an existing private storm drain line between the project site and Keefe Court. The proposed project would reduce the runoff flows in other areas of the project site (Hansen 2023). While the street storm drain system would need to be designed to withstand a 25-year storm, the applicant would need to show that the project would be designed to contain the 100-year storm within the right-of-way per San Bruno Municipal Code section 12.44.090(B), (F), subject to staff review. Additionally, as part of the recreation component of the proposed project, there would need to be a stormwater collection and treatment system that also meets regulatory requirements. As a result, the runoff would not exceed the stormwater drainage system capacity.

Wastewater Treatment and Sanitary Sewer Collection System

The project would generate additional wastewater on the project site due to the 155 residences' water use and the use of restrooms and other water at the athletic field. The project's sanitary sewer service would connect to an existing sanitary sewer main located in Courtland Drive near the northern entrance to the project site.

The proposed development includes 155 single-family residential dwelling units (DUs). The average base wastewater flow (BWF) contributed by the single-family DUs was estimated based on a design unit flow factor of 170 gallons per day (gpd) per DU, as used to estimate flows from future single-family residences for the 2014 Sewer Master Plan. Based on a previous version of the project, which included 156 units rather than 155 and is therefore substantially similar to the proposed project, the total average BWF generated by the new development was estimated to be 26,520 gpd for the purpose of the model analysis (Woodard and Curran 2022.) System capacity was evaluated based on the ability of the sanitary sewer system to convey peak wet weather flow (PWWF) under design storm conditions. The model was run for existing PWWF conditions with and without the proposed development, and model results were evaluated to identify any predicted surcharge under design PWWF in the sewers downstream of the proposed development that would result from the development flows. The results of the study show that there would be no surcharge or capacity issues resulting from a development with 156 units (Woodard and Curran 2022). With one fewer unit compared to the development studied for the evaluation, there also would not be surcharge or capacity issues. There would be additional wastewater created in the recreational area restrooms and concession stand; however, this would not generate the same amount of wastewater as a home and would therefore fall within the bounds of the system capacity evaluation and would not cause surcharge or capacity issues.

Although there is sufficient capacity for sanitary sewer from the site, the City has identified condition issues with the sanitary sewer line in Courtland Drive and Whitman Way that would convey wastewater from the project site. Roots have intruded into pipes, and the pipes are aging. Currently, this sanitary sewer line conveys whatever minimal wastewater is conveyed from restrooms at the recreation field and project site as well as the church. It also collects wastewater from approximately 50 residences along Courtland Drive north of the project site, Glenbrook Lane, and Rosewood Drive. The addition of wastewater from 155 residences on site would substantially increase the volume of wastewater conveyed through these pipes by quadrupling the number of homes discharging wastewater to this sewer line. Therefore, there is a potential for additional flows to exacerbate these degraded conditions. This impact would be **potentially significant**.

Buildout of the General Plan includes the level of density proposed on the project site. General Plan buildout would result in an increase of approximately 105,400 gpd of wastewater. Together with existing and pending flows, the City's 2025 flows are projected at 3.1 mgd of wastewater, which is still only a third of plant dry season capacity. While the wet weather flows pose capacity issues, there are current efforts to address this issue. Additionally, the current Housing Element, which anticipates housing growth through 2031, concluded that there would be adequate wastewater treatment capacity for buildout of the Housing Element (City of San Bruno 2022). The proposed project and project variant would be adequately served by existing stormwater drainage and wastewater treatment capabilities.

Electricity and Telephone

Standard electric heating, ventilation, and air conditioning (HVAC) units would be installed, one per unit (155 total). All HVAC equipment would be electric. All residential units would come preinstalled with a photovoltaic system. The residential component proposed project could increase energy use at the site by upward of 962,477 kilowatt hours (kWh) per year. No substantial utility upgrades (e.g., substations, voltage increases) are expected given the project is a residential subdivision within an existing residential area. Additionally, the addition of lighting for the fields is not expected to result in the need for utility upgrades. Electric, cable, and telephone service is anticipated to connect to existing service lines in Courtland Drive. Therefore, there would be no need for other new infrastructure for electricity for the proposed project or project variant.

Natural Gas

No natural gas use is anticipated for the proposed project or project variant.

Water Distribution System

Results from the Water System Hydraulic Evaluation of Crestmoor Residential Development (West Yost, September 2023) determined that the hydraulic model indicates that the proposed pipelines and existing water system infrastructure cannot meet the minimum fire flow requirement of 500 gallons per minute (gpm) while maintaining a residual pressure of 20 pounds per square inch (psi) due to pressure deficiencies at existing high elevation services along Madison Avenue. The evaluation identified a regulating station improvement needed at regulator station 13, which is located near the intersection of Piedmont Avenue and Madison Avenue. A pressure regulating station contains pressure values that regulate water from higher-pressure zones into lower-pressure zones. Water use at the fields would be similar to or less than current use. If turf is synthetic, then water use would decrease. If turf is natural grass, then water use would likely stay the same with irrigation, restroom use, and other incidental water consumption. However, without the improvement related to the residential development, impacts related to water pressure would be **potentially significant**.

Conclusion

The proposed project would be a natural gas–free project. The proposed project would not create a need for new wastewater facilities, nor would it create a new need for electric power or telecommunication facilities. However, the proposed project could exacerbate degraded conditions in the sanitary sewer within Courtland Drive and Whitman Way. The proposed project would also trigger the need for upgrades in the water distribution system to meet minimum fire flow requirements. The proposed project and variant would have the same utility needs and, therefore, the same impacts. Impacts would be **potentially significant** due to the potential for worsened sewer line degradation and the hydraulic deficiency. Mitigation measures UT-1a and UT-1b would be implemented to reduce the impact to **less than significant with mitigation**.

Mitigation Measure UT-1a: Rehabilitate Sanitary Sewer within Courtland Drive and Whitman Way.

In coordination with City of San Bruno Public Works, the proponent of the residential component of the proposed project shall rehabilitate approximately 929 linear feet

of sewer main on Courtland Drive (from MH 1874 to MH 1222) and approximately 740 linear feet of sewer main on Whitman Way (from MH 1222 to MH 1331).

Mitigation Measure UT-1b: Upgrade Water System Regulator Station 13.

In coordination with City of San Bruno Public Works, the proponent of the residential component of the proposed project shall upgrade regulator station RS-13 to meet or exceed the minimum fire flow requirements for the project of 500 gpm. The upgrade will consist of abandoning the existing RS-13 and rerouting piping to install a new regulating station in the vicinity of the existing RS-13 with the proper-sized valves and piping to meet or exceed the minimum fire-flow requirement.

Impacts of Mitigation Measure UT-1a

Mitigation Measure UT-1a would require rehabilitation of approximately 1,700 linear feet of existing sewer line on Courtland Drive and Whitman Way just north of the development. The exact method of rehabilitation is not currently known, but the two most used methods for pipe rehabilitation are trenching (i.e., street opening/asphalt cutting, pipe replacement, trench restoration) and pipe bursting (i.e., opening of pits in the ground, bursting existing pipe and pulling a new pipe through the existing alignment, and pit restoration). It could also be combination of these two. CEQA requires that an EIR discuss significant impacts of mitigation measures, but in less detail than the significant effects of the proposed project (State CEQA Guidelines Section 15126.4(a)(1)(D)). The following describes the potential impacts of mitigation measure UT-1 by resource area. Note there would be no adverse impacts during operation because the rehabilitation work is to an existing sewer line and affected roadways would be restored to their current conditions.

- **Aesthetics:** Rehabilitation activities would introduce temporary construction equipment and activities along public streets. However, these activities would look like typical utility construction and maintenance activities and would last for a short amount of time. There would be no significant impact because of the mitigation measure.
- **Air Quality:** Rehabilitation efforts would generate criteria pollutant emissions from use of construction equipment. However, the sewer rehabilitation as a temporary activity would not be inconsistent with any air quality plans or policies. Emissions of the criteria pollutants of the entire proposed project and variant across 40.2 acres are substantially under significance thresholds (see Table 3.2-7 in Section 3.2, *Air Quality*) such that 600 feet of asphalt cutting and trenching would not result in a new significant impact. For health risks, the maximally impacted receptor is located adjacent to the project's southwestern boundary, which is farther away from where the sewer work would occur, indicating that it is unlikely for additional health risks to result. No new significant impact is expected because of the mitigation measure.
- **Biological Resources:** While the sewer rehabilitation would not involve vegetation removal, noise from these activities may disturb nesting birds and roosting bats similar to the proposed project and variant, which could be significant. Mitigation measures BIO-1b and BIO-1c (described in Section 3.3, *Biological Resources*) would be implemented and would reduce these impacts to less than significant, as with the proposed project and variant.
- **Cultural Resources, Tribal Cultural Resources:** Sewer rehabilitation may involve trenching but is likely to only disturb soils that have previously been disturbed due to prior sewer line construction activities. Nonetheless, if these activities intrude into native soils, there is a potential for disturbing previously unknown resources, which could be significant. Mitigation

measures CUL-2a and CUL-2b (described in Section 3.4, *Cultural Resources,* would be implemented and would reduce these impacts to less than significant, as with the proposed project and variant.

- **Energy:** Sewer rehabilitation would require the temporary use of equipment that would consume fuel and electricity. This equipment would be of similar to that used for the proposed project and variant, and the additional energy consumption would be incremental and consistent with the energy consumption described for construction of the proposed project and variant. There would be no significant impact as a result of the mitigation measure.
- **Geology and Soils:** Rehabilitation work would not exacerbate seismicity or result in additional erosion because it would take place in a paved roadway where spoils would be used to backfill any trenched areas. There would be no significant impact as a result of the mitigation measure.
- **Greenhouse Gas Emissions:** Rehabilitation efforts would generate greenhouse gases from use of construction equipment. However, the sewer rehabilitation as a temporary activity would not be inconsistent with the Bay Area Air Quality Management District (BAAQMD) land use thresholds or conflict with any plans or policies. There would be no significant impact as a result of the mitigation measure.
- **Hazards and Hazardous Materials:** Rehabilitation work would use similar common hazardous materials as described for construction of the proposed project and project variant. The additional use would be incremental and subject to the same statutes and regulations as described for the proposed project and variant. Rehabilitation work would pose no safety hazard to airport operations because the equipment would be similar to typical road maintenance equipment. There would be no significant impact as a result of the mitigation measure.
- **Hydrology and Water Quality:** Sewer rehabilitation work would not change any drainage patterns on the site or decrease groundwater supplies. Trenching and other ground-disturbing and asphalt sawing activities may result in sedimentation into storm drains. The MS4 Phase I San Francisco Bay MRP (Order No. R2-2022-0018 NPDES Permit No. CAS612008) outlines requirements for municipal operations, including street and road repair and maintenance and activities such as pavement cutting. Therefore, there would be no significant impact as a result of the mitigation measure.
- **Land Use and Planning, Population and Housing:** Sewer rehabilitation activities would occur within an existing street on existing facilities and would have no impact on population and housing or land use and planning. There would be no significant impact as a result of the mitigation measure.
- **Noise:** Sewer rehabilitation work that involves ground disturbance would generate noise and vibration, as would any large equipment operating during the work. Based on a reference vibration level for heavy equipment of 0.035 to 0.089 inch/second at a reference distance of 25 feet, vibration from construction would be below the 0.5 inch/second threshold for damage to structures or annoyance. It is probable that the loudest piece of equipment would be a concrete saw, which generates about 90 decibels (dB) at a distance of 50 feet. With residences on either side of Courtland Drive, it is possible activities may be closer than 50 feet and would generate louder noise. However, the noise would be short term, occur during the daytime when residences are least sensitive, and localized. Noise would also likely be screened from view of

the primary outdoor use/backyard areas and interior areas, which reduces noise levels. As a result, noise impacts from the work would be less than significant.

- **Public Services:** Construction activities would be temporary and would not increase the need for police, fire, school, or library services. There would be no significant impact as a result of the mitigation measure.
- **Recreation:** Sewer rehabilitation would not impact any recreational facilities because it would be entirely within a residential street. Although there may be temporary road closures during rehabilitation activities, the recreational facility on the project site can be accessed from the southern part of the project site. There would be no significant impact as a result of the mitigation measure.
- **Transportation:** Rehabilitation work may require temporary road closures, though there are alternate ways to access the neighborhoods in the area for emergency services. These closures would also be short term in nature and would therefore not result in any conflicts or inconsistencies with plans, policies, or vehicle miles traveled (VMT) goals. There would be no significant impact as a result of the mitigation measure.
- **Utilities and Service Systems:** The sewer rehabilitation work would not change the volumes of flow into the system or generate any ongoing waste, water needs, or solid waste. There could be the need to dispose of minimal amounts of asphalt from trenching, which would be an incremental amount when compared to the residential component and would be disposed of in accordance with applicable statutes and regulations. No additional capacity would be needed. There would be no significant impact as a result of the mitigation measure.
- **Wildfire:** The sewer rehabilitation work would occur within paved streets and within a residential development. Therefore, there is no risk of igniting wildfire in vegetated areas. There would be no significant impact as a result of the mitigation measure.

Impacts of Mitigation Measure UT-1b

For Regulator Station 13, Mitigation Measure UT-1b in general would require removing and abandoning the existing regulator station and re-establishing a direct pipe connection in the existing water main. A new pressure reducing valve (PRV) (regulator station) would then be installed at the suggested location, in the shoulder, with a traffic rated lid. The contractor would then make the connections from the main to the PRV. The following describes the potential impacts of mitigation measure UT-1b by resource area. Note there would be no adverse impacts during operation because the work involves replacement of an existing regulator station, and affected roadways would be restored to their current conditions.

- **Aesthetics:** Replacement of Regulator Station 13 would introduce temporary construction equipment and activities along Piedmont Avenue near its intersection with Madison Avenue. However, these activities would look like typical utility construction and maintenance activities and would last for a short amount of time. There would be no significant impact as a result of the mitigation measure.
- **Air Quality:** Replacement of Regulator Station 13 would generate criteria pollutant emissions from use of construction equipment. However, the sewer rehabilitation as a temporary activity would not be inconsistent with any air quality plans or policies. Emissions of the criteria pollutants of the entire proposed project and variant across 40.2 acres are substantially under significance thresholds (see Table 3.2-7 in Section 3.2) such that localized asphalt cutting and

trenching would not result in a new significant impact. For health risks, the regulator station work would be less emissions-intensive than the previously evaluated construction activities, which resulted in health risks and concentrations of particles less than 2.5 microns in diameter ($PM_{2.5}$) well below the applicable BAAQMD significance thresholds. Given the relatively minor additional emissions that would result from replacement of the regulator station, it is unlikely that additional health risks or $PM_{2.5}$ concentration exceedances would result. No new significant impact is expected as a result of the mitigation measure.

- **Biological Resources:** While the replacement of Regulator Station 13 would not involve vegetation removal, noise from these activities may disturb nesting birds and roosting bats similar to the proposed project and variant, which could be significant. Mitigation measures BIO-1b and BIO-1c (described in Section 3.3) would be implemented and would reduce these impacts to less than significant, as with the proposed project and variant.
- **Cultural Resources, Tribal Cultural Resources:** Replacement of Regulator Station 13 would involve excavation but is likely to only disturb soils that have previously been disturbed due to prior utility construction activities. Nonetheless, if these activities intrude into native soils, there is a potential for disturbing previously unknown resources, which could be significant. Mitigation measures CUL-2a and CUL-2b (described in Section 3.4) would be implemented and would reduce these impacts to less than significant, as with the proposed project and variant.
- **Energy:** Replacement of Regulator Station 13 would require the temporary use of equipment that would consume fuel and electricity. This equipment would be similar to that used for the proposed project and variant, and the additional energy consumption would be incremental and consistent with the energy consumption described for construction of the proposed project and variant. There would be no significant impact as a result of the mitigation measure.
- **Geology and Soils:** Replacement of Regulator Station 13 would not exacerbate seismicity or result in additional erosion because it would take place in a paved roadway where spoils would be used to backfill any trenched areas. There would be no significant impact as a result of the mitigation measure.
- **Greenhouse Gas Emissions:** Replacement of Regulator Station 13 would generate greenhouse gases from use of construction equipment. However, regulator station replacement as a temporary activity would not be inconsistent with the BAAQMD land use thresholds or conflict with any plans or policies. There would be no significant impact as a result of the mitigation measure.
- **Hazards and Hazardous Materials:** Replacement of Regulator Station 13 would use similar common hazardous materials as described for construction of the proposed project and project variant. The additional use would be incremental and subject to the same statutes and regulations as described for the proposed project and variant. Regulator station replacement work would pose no safety hazard to airport operations because the equipment would be similar to typical road maintenance equipment. There would be no significant impact as a result of the mitigation measure.
- **Hydrology and Water Quality:** Replacement of Regulator Station 13 would not change any drainage patterns on the site or decrease groundwater supplies. Trenching and other ground-disturbing and asphalt sawing activities may result in sedimentation into storm drains. The MS4 Phase I San Francisco Bay MRP (Order No. R2-2022-0018 NPDES Permit No. CAS612008) outlines requirements for municipal operations, including street and road repair and

maintenance and activities such as pavement cutting. Therefore, there would be no significant impact as a result of the mitigation measure.

- **Land Use and Planning, Population and Housing:** Replacement of Regulator Station 13 would occur within an existing street on existing facilities and would have no impact on population and housing or land use and planning. There would be no significant impact as a result of the mitigation measure.
- **Noise:** Replacement of Regulator Station 13 work that involves ground disturbance would generate noise and vibration, as would any large equipment operating during the work. Based on a reference vibration level for heavy equipment of 0.035 to 0.089 inch/second at a reference distance of 25 feet, vibration from construction would be below the 0.5 inch/second threshold for damage to structures or annoyance. It is probable that the loudest piece of equipment would be a concrete saw, which generates about 90 dB at a distance of 50 feet. With residences near the work area, it is possible activities may be closer than 50 feet and would generate louder noise. However, the noise would be short term, occur during the daytime when residences are least sensitive, and localized. Noise would also likely be screened from view of the primary outdoor use/backyard areas and interior areas, which reduces noise levels. As a result, noise impacts from the work would be less than significant.
- **Public Services:** Construction activities would be temporary and would not increase the need for police, fire, school, or library services. There would be no significant impact as a result of the mitigation measure.
- **Recreation:** Replacement of Regulator Station 13 would not impact any recreational facilities because it would be entirely within a residential street. Although there may be temporary closures of Piedmont Avenue during activities, the recreational facility on the project site can be accessed from the northern part of the project site. There would be no significant impact as a result of the mitigation measure.
- **Transportation:** Replacement of Regulator Station 13 work may require temporary road closures, though there are alternate ways to access the neighborhoods in the area for emergency services. These closures would also be short term in nature and would, therefore, not result in any conflicts or inconsistencies with plans, policies, or VMT goals. here would be no significant impact as a result of the mitigation measure.
- **Utilities and Service Systems:** Replacement of Regulator Station 13 would not change the volumes of flow into the system or generate any ongoing waste, water needs, or solid waste. There could be the need to dispose of minimal amounts of asphalt from excavation, which would be an incremental amount when compared to the residential component and would be disposed of in accordance with applicable statutes and regulations. No additional capacity would be needed. There would be no significant impact as a result of the mitigation measure.
- **Wildfire:** Replacement of Regulator Station 13 would occur within Piedmont Avenue, which is paved and within a residential development. developed area. Therefore, there is no risk of igniting wildfire in vegetated areas. There would be no significant impact as a result of the mitigation measure.

Impact UT-2: Would this project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years? (Less than Significant)

Construction

Project construction would not result in a substantial increase in water demand to support construction activities. Construction crews would use temporary restroom facilities that would not connect to or utilize water supplies. Limited construction-phase water needs for activities such as dust suppression would be met through the metered use of water conveyed by water trucks and tanks. The project would use Tier 4 equipment exclusively and would implement standard dust control on all work using water trucks. Wind erosion would be mitigated per standard SWPPP requirements. These uses would be temporary and would not be a new, permanent use of water supplies. Proposed project and project variant construction would not result in a substantial increase in overall water demand that could not be met by water supplies during normal, dry, and multiple dry years.

Operation

Implementation of the project would increase water demand through domestic and irrigation uses. Water-conserving irrigation systems including climate-sensitive controllers in common areas would be installed. Furthermore, the athletic fields would include either artificial or natural turf. The use of artificial turf would reduce the water demand below the current water demand for full grass fields. Use of natural turf would maintain the current water use at the site. Table 3.17-1 shows the projected water use for the proposed project. As shown in Table 3.17-1, the proposed project would require up to approximately 0.03 mgd of water, based on the Model Water Efficient Landscape Ordinance Maximum Allowable Water Allowance.

Table 3.17-1. Proposed Project Water Use

Land Use Type [a]	Quantity of: Dwelling Units (Residential), or Acreage (Open Space)	Water Use Factor [b]	Water Use Factor Units	Average Day Demand Potable Water Use (mgd)
Single-Family Residential [c]	156	147	gpd/du	0.023
Private Open Space [d]	0.25	1.6	afy/ac	0.0004
Parkland Dedication [d]	4.75	1.6	afy/ac	0.007
Total				**0.03 mgd**

[a] Land use data from drawings prepared by SummerHill Homes, KTGY, and CBG dated March 7, 2022.
[b] Residential factor from the City's 2021 Water System Master Plan. Irrigation factor developed based on Model Water Efficient Landscape Ordinance Maximum Allowable Water Allowance. Factors include an assumed 8.0 percent nonrevenue water.
[c] Based on prior proposal that include 156 units.
[d] Private open space and parkland dedication acreages determined using geographical information system (GIS). Parkland areas unlikely to be irrigated are not included in this acreage.
Source: West Yost 2022
gpd/du = gallons per day per dwelling unit; afy/ac= acre feet per year

Table 3.17-2 summarizes the City's projected water supply and demand with implementation of the project, assuming implementation of the Bay-Delta Plan Amendment. Implementation of Bay-Delta Plan Amendments would result in severe reductions in water supply. Therefore, the supply estimates assume its implementation would be the most conservative water supply scenario.

Water demand projections in this plan are based on projections developed for the City's 2021 Water System Master Plan (2021 WSMP). In the 2021 WSMP, water demands were projected to 2040, which is the projected buildout of the City's water service area (West Yost 2021). Therefore, the projections account for a use like the proposed project, which is also within the General Plan buildout projections in terms of density allowed on the project site. Also, in accordance with the Regional GSR Project, projected groundwater supplies under normal hydrologic conditions assume that groundwater use is minimized (i.e., "put" operations). During single dry and multiple dry years, projected groundwater supplies are assumed to be equal to 2.10 mgd.

As shown in Table 3.17-2, even with the City's anticipated dry year demand reductions, supply deficits would still occur during various years of the single dry year and multiple dry year scenarios that consider implementation of the Bay-Delta Plan Amendments. The most severe shortages would occur in 2040 during multiple dry year 4 and multiple dry year 5, where the percent shortfall of demand would be 24 percent in both scenarios, as shown in Table 3.17-2.

Table 3.17-2. City of San Bruno Water Demand Versus Supply During Hydrologic Normal, Single Dry, and Multiple Dry Years, With Bay-Delta Plan Amendment

		Year[a]		
Hydrologic Condition		2025	2040	2045
Normal Year				
Available Water Supply		5.39	5.35	5.36
Total Water Demand		3.53	4.78	4.78
Potential Surplus (Deficit)		1.86	0.57	0.58
Percent Shortfall of Demand		--	--	--
Single Dry Year				
Available Water Supply		4.20	4.16	3.88
Total Water Demand		3.53	4.78	4.78
Potential Surplus (Deficit)		0.67	(0.62)	(0.90)
Percent Shortfall of Demand		--	13%	19%
Multiple Dry Years				
Multiple Dry Year 1	Available Water Supply	4.20	4.16	3.88
	Total Water Demand	**3.53**	**4.78**	**4.78**
	Potential Surplus (Deficit)	0.67	(0.62)	(0.90)
	Percent Shortfall of Demand	--	13%	19%
Multiple Dry Year 2	Available Water Supply	3.90	3.87	3.88
	Total Water Demand	**3.53**	**4.78**	**4.78**
	Potential Surplus (Deficit)	0.37	(0.91)	(0.90)
	Percent Shortfall of Demand	--	19%	19%
Multiple Dry Year 3	Available Water Supply	3.90	3.87	3.88
	Total Water Demand	**3.53**	**4.78**	**4.78**
	Potential Surplus (Deficit)	0.37	(0.91)	(0.90)
	Percent Shortfall of Demand	--	19%	19%

Hydrologic Condition		Year[a] 2025	2040	2045
Multiple Dry Year 4	Available Water Supply	3.90	3.66	3.61
	Total Water Demand	**3.53**	**4.78**	**4.78**
	Potential Surplus (Deficit)	0.37	(1.12)	(1.17)
	Percent Shortfall of Demand	--	23%	24%
Multiple Dry Year 5	Available Water Supply	3.90	3.66	3.61
	Total Water Demand	**3.53**	**4.78**	**4.78**
	Potential Surplus (Deficit)	0.37	(1.12)	(1.17)
	Percent Shortfall of Demand	—	23%	24%

[a] million gallons per day
Source: West Yost 2021

Although the impact of the Bay-Delta Plan Amendment is severe, a maximum demand reduction of 30 percent can still be achieved by implementation of Stage 3 of the City's Water Shortage Contingency Plan.[1] The shortage response actions for Stage 2 include implementation of mandatory water allotments for all accounts, increasing intensity of public outreach, increasing monitoring of water use, and increasing rates and penalties for excess water use (West Yost 2021). During the recent drought in 2015 to 2016, the "conservation standards for the individual BAWSCA agencies ranged from 8 percent to 36 percent, assigned based on each agency's residential per capita water use in summer 2014. During the 12-month period for which the mandatory conservation standards were in effect, all of the BAWSCA member agencies met their conservation standards. BAWSCA agencies reduced potable water use by 27 percent as compared to 2013, collectively saving 23 billion gallons of water (166 percent of their savings target." San Bruno's assigned conservation standard was about 8 percent, and the achieved reduction between June 2015 and May 2016 was 24 percent, far exceeding the conservation standard (BAWSCA 2017). The proposed project and project variant would have the same water consumption and therefore would result in the same impacts. The proposed project and project variant would not require new or expanded water supply entitlements or resources, and impacts would be **less than significant**.

Impact UT-3: Would the project result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? (Less than Significant)

The proposed development includes 155 single-family residential DUs. The project's sanitary sewer service would connect to an existing sanitary sewer main located in Courtland Drive near the northern entrance to the project site. As described in greater detail under Impact UT-2, project implementation would increase onsite water consumption when compared to current conditions. Accordingly, a corresponding increase in wastewater production would occur from the residential component of the project. The recreational component would likely create similar amounts of wastewater to present production, given the proposed recreational component would contain similar wastewater-producing uses such as a restroom.

[1] As included in the 2020 UWMP, the Water Shortage Contingency Plan includes six water shortage stages (Stages 1–6) to align with the state's six standard water shortage levels. Each stage corresponds to progressive ranges of up to 10, 20, 30, 40, 50 percent, and greater than 50 percent shortages from the normal supply condition.

The average BWF contributed by the single-family DUs was estimated based on a design unit flow factor of 170 gpd per DU, as used to estimate flows from future single-family residences for the 2014 Sewer Master Plan. Therefore, the total average BWF generated by the new development was estimated to be 26,520 gpd for the purpose of this model analysis. (Woodard & Curran 2022). As discussed in more detail under Impact UT-1, the model results showed that there would be no surcharge or capacity issues resulting from the proposed development. Additionally, as addressed in greater detail in Impact UT-1, there is sufficient capacity to treat this wastewater. The proposed project and project variant would have the same wastewater generating components and would therefore result in the same impacts.

Therefore, impacts on wastewater capacity would be **less than significant** because the current sewer system has adequate capacity to serve the project's projected demand.

Impact UT-4: Would the project generate solid waste in exceedance of state or local standards, or in excess of the capacity of local infrastructure, or other impediment to the attainment of solid waste reduction goals? (Less than Significant)

Construction

Project construction would result in a short-term generation of solid waste. Solid waste would consist of demolition debris as well as debris from construction activities. However, the State of California Green Building Standards Code (CALGreen) requires that at least 65 percent of all debris from demolition of any residential building be diverted from landfills via recycling, salvage, and other similar programs. Therefore, it is expected that through adherence to regulatory requirements, construction waste associated with future development within the project site that would be disposed of at landfills would be substantially reduced, and impacts under this criterion for both he proposed project and project variant would be **less than significant**.

Operation

The reasonably foreseeable use of the recreational fields would continue to generate solid waste similar to existing conditions given the use would remain about the same. However, with the addition of 155 single-family residential homes, development within the project site would result in an increased site occupancy when compared to current conditions, subsequently increasing the amount of operational solid waste that would be generated at the project site. It is anticipated that recreational uses would generate substantially similar solid waste as current uses. Estimated net new project-related direct operational solid waste generation is displayed in Table 3.17-3 according to the most recent solid waste diversion and solid waste generation rates for the City of San Bruno provided by Cal Recycle.

As displayed in Table 3.17-3, the proposed project is estimated to generate 155.5 tons annually. Combined with 2022 City of San Bruno solid waste disposal quantities (29,137 tons) this would result in a total quantity of approximately 29,292 annual tons including solid waste quantities that are currently generated citywide (CalRecycle 2019b).

The San Bruno Transfer Station is capable of processing and redistributing up to 768 tons per day of solid waste. Based on the City's 2022 total solid waste generation of 29,137 tons, the San Bruno Transfer Station currently processes and redistributes approximately 79.8 tons of City solid waste

daily.[2] Incorporating anticipated proposed project prediversion solid waste generation quantities of approximately 0.6 daily ton of solid waste into this value, with project implementation the City of San Bruno would direct 80.5 daily tons of solid waste for processing and redistribution at the San Bruno Transfer Station. Thus, the transfer station would have sufficient capacity to receive, process, sort, and re-distribute project-generated operational solid waste.

Most solid waste generated by the city is brought from San Bruno Transfer Station to Corinda Los Trancos Landfill, which has a remaining capacity of 22,180,000 cubic yards and is permitted for continued service through 2034. This capacity is sufficient to support proposed project solid waste disposal needs through 2034 or facility closure. The proposed project and project variant would have the same solid waste generating components and would, therefore, result in the same impacts. Impacts would be **less than significant**.

Table 3.17-3. Anticipated Solid Waste Generation for the Proposed Project

Waste Generation Source	Net New Units	Disposal Rate (lbs/DU/day)	Net New Estimated Daily Waste Generation (tons)	Net Annual Estimated Waste Generation (tons)
Single-Family Unit	155	9.8	0.7	155.5

Source: CalRecycle 2019b.
lbs=pounds; DU = dwelling unit

Impact UT-5: Would the project fail to comply with federal, state, and local management and reduction statutes and regulations related to solid waste? (Less than Significant)

Impact UT-4 addresses compliance with federal, state, and local management and reduction statutes and regulations related to solid waste. As described under that impact, impacts of both the proposed project and project variant would be **less than significant**.

[2] This value was calculated based on the City of San Bruno's 2022 total solid waste generation of 29,137 tons, which, divided by 365 days per year, equates to approximately 80 daily tons of solid waste that is sorted and transferred through the San Bruno Transfer Station.

3.18 Wildfire

This section evaluates the project's potential environmental impacts related to wildfire. It first describes the existing wildfire risks and hazards of the project area and identifies the state and local plans, policies, and regulations applicable to the project. The analysis discusses potential impacts of the project and identifies mitigation measures, where needed and feasible, for reducing those environmental impacts.

3.18.1 Existing Conditions

Regulatory Setting

Federal

Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 provides the legal basis for the Federal Emergency Management Agency's (FEMA) mitigation planning requirements for state, local, and tribal governments as a precursor to mitigation grant assistance. The Disaster Mitigation Act of 2000 requires that local governments prepare a local hazard mitigation plan that must be reviewed by the State Mitigation Officer, approved by FEMA, and renewed every 5 years. The plan must include a planning process, a risk assessment, a mitigation strategy, and plan maintenance and updating procedures to identify the natural hazards, risks, and vulnerabilities of the area under the jurisdiction of the government. Natural hazards include, but are not limited to, earthquakes, tsunamis, tornadoes, hurricanes, flooding, and wildfires.

The County of San Mateo is a part of the Multi-Jurisdictional Hazard Mitigation Plan, developed in partnership with the City of San Bruno, which serves as a guide to hazard mitigation planning to protect the property and residents of the county from the effects of hazard events, including wildfires. **Error! Bookmark not defined.**Hazard mitigation is the use of long- and short-term strategies to reduce the loss of life, personal injury, and property damage that can result from a disaster. It involves planning efforts, programs, and other activities that can mitigate the impacts of hazards. The current plan outlines mitigation goals and actions for hazards, including but not limited to drought, floods, and wildfires. For wildfire, the plan describes the general background of wildfires in northern California and San Mateo County, the hazard profile such as the ecology, location, frequency and severity, and warning times for wildfires, statistics for the most vulnerable population in terms of exposure to wildfire risk, current issues with wildfire, and the future trends in development in San Mateo County.

State

2019 California Strategic Fire Plan

The California Department of Forestry and Fire Protection's (CAL FIRE) Strategic Fire Plan provides an overall vision for a built and natural environment that is more fire resilient through the coordination and partnerships of local, state, federal, tribal, and private entities (CAL FIRE 2018). First developed in the 1930s, the Strategic Fire Plan is periodically updated; the current plan was

prepared in 2019. The plan analyzes and addresses the effects of climate change, overly dense forests, prolonged drought, tree mortality, and increased severity of wildland fires through goals and strategies.

State Responsibility Areas (Public Resources Code 4102)

State Responsibility Areas (SRAs) are defined by Public Resources Code Section 4102 as areas of the state in which CAL FIRE has determined that the financial responsibility for preventing and suppressing fires lies with the State of California. SRAs are lands in California where CAL FIRE has legal and financial responsibility for wildfire protection. SRA lands typically are unincorporated areas of a county, are not federally owned, have wildland vegetation cover, have housing densities lower than three units per acre, and have watershed or range/forage value. Where SRAs contain built environment or development, the local government agency assumes responsibility for fire protection.

Local Responsibility Areas

Local Responsibility Areas (LRAs) include lands that do not meet criteria for SRAs or federal responsibility areas (California Code of Regulations, Title 14, Section 1268.00(d)). Also included are lands in cities, cultivated agricultural lands, and nonflammable areas in the unincorporated parts of a county. LRAs can include flammable vegetation and wildland-urban interface areas. LRA fire protection is provided by the local fire departments, fire protection districts, or county fire departments or by contract with CAL FIRE.

Very High Fire Hazard Severity Zones (Government Code 51177)

Very High Fire Hazard Severity Zones (FHSZs) are defined by Government Code Section 51177 as CAL FIRE–designated areas with the highest probability for wildfire. Designations for these zones are based on consistent statewide criteria and the severity of fire hazard expected. The designation of Very High FHSZ is also based on fuel loading, slope, fire weather, and other factors, such as wind, which have been identified by CAL FIRE as major causes for the spread of wildfire. FHSZ maps are produced and maintained for each county in the state.

California Building Code and Fire Code

The California Code of Regulations, Title 24, is a compilation of building standards, including fire safety standards for residential and commercial buildings. The California Building Code standards serve as the basis for the design and construction of buildings in California; the California Fire Code is a component of the California Building Code. Typical fire safety requirements of the California Fire Code include the installation of sprinklers in buildings; the establishment of fire resistance standards for fire doors, building materials, and particular types of construction; and the clearance of debris and vegetation within a prescribed distance from occupied structures in wildfire hazard areas. The California Fire Code applies to all occupancies in California, except where more stringent standards have been adopted by local agencies. The 2022 California Building Standards Code became effective on January 1, 2023. All construction and development projects submitted to the City after this date have to comply with the new code. These ordinances were adopted by the City later in 2022. It included adoption of the 2022 state fire code with local amendments related to areas such as recreational fires and new definitions.

California Public Utilities Commission Decision 17-12-024

To improve fire safety associated with electrical utility facilities, the California Public Utilities Commission's (CPUC) Safety and Enforcement Division adopted Decision 17-12-024, Decision Adopting Regulations to Enhance Fire Safety in the High Fire-Threat District. The decision mandated CPUC to prepare a statewide Fire-Threat Map to identify areas with the highest risk—specifically, areas where stricter fire safety regulations should be incorporated. The Fire-Threat Map divides such areas into Tier 1 (High), Tier 2 (Elevated), and Tier 3 (Extreme) Hazard Zones.

Regional and Local

San Bruno General Plan

The Health and Safety Element of the San Bruno General Plan (City of San Bruno 2009) sets forth policies and procedures pertaining to reduction of fire hazards. The General Plan has the following policies related to fire hazard and safety that are relevant to the project.

- **HS-1** Regulate development, including remodeling or structural rehabilitation, to assure adequate mitigation of safety hazards on sites having a history or threat of slope instability, erosion, subsidence, seismic dangers (including those resulting from liquefactions, ground failure, ground rupture), flooding, and/or fire hazards.
- **HS-2** Review and revise the City's Building Code, Zoning Ordinance, and Subdivision requirements to safeguard against seismic, geologic, and safety hazards. Mitigation should include:
    - Minimal grading and removal of natural vegetation to prevent erosion and slope instability. Cleared slopes should be replanted with vegetation.
    - Proper drainage control to prevent erosion of the site and affected properties.
    - Careful siting and structural engineering in unstable areas.
    - Consideration of flooding and fire hazards in siting and designing new development.
- **PFS-30:** Require installation and maintenance of fire protection measures in high-risk and urban interface areas, including but not limited to:
    - Proper siting, road and building clearances, and access;
    - Brush clearance (non-fire-resistant landscaping 50 feet from structures);
    - Use of fire resistive materials (pressure-impregnated, fire resistive shingles or shakes);
    - Landscaping with fire resistive species; and
    - Installation of early warning systems (alarms and sprinklers).
- **PFS-31:** Ensure adequate fire water pressure as a condition of approval for all new development projects.
- **PFS-34:** Identify and remove mature and/or diseased Eucalyptus trees in rights-of-way and other open areas, if they pose a fire hazard or other threat to health and safety.

Environmental Setting

Wildfire Behavior and Risks

The term wildfire refers to an unplanned, unwanted, wildland fire, including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to extinguish the fire (California Government Code Section 51177). Wildfire characteristics depend on the circumstances where the fire is burning. Brush fires, which burn both natural and nonnative vegetation, typically burn fast and very hot, and often threaten homes in the area and lead to serious destruction of vegetation. Woodland fires are relatively cool under natural conditions; however, if a brush fire spreads to a woodland, it could generate a destructive hot crown fire. Currently, no suitable management technique of reasonable cost has been devised to reduce the risk of these fires. However, these fires can typically be controlled relatively quickly and easily if they are reachable by fire equipment.

Short-term effects of wildfires include destruction of timber or agriculture, and loss of wildlife habitat, scenic vistas, and watersheds, as well as immediate impacts on human health (e.g., wheezing, coughing, sore eyes and throat, shortness of breath) and loss of human life or injury (U.S. Environmental Protection Agency 2022). Long-term effects of wildfires, depending on their location, include smaller timber harvests, reduced access to recreational areas, and destruction of community infrastructure and cultural or economic resources. Wildfires also increase the area's vulnerability to secondary impacts such as flooding, landslides, and increased runoff. Wildfire damage to life and property is generally greatest in areas designated as wildland-urban interface, where development is in close proximity to densely vegetated areas.

Climate change is expected to contribute to significant changes in fire regimes. Fire is a natural component of many ecosystems and natural community types, including forestland. For each of these natural communities, fire frequency and intensity influence community regeneration, composition, and extent. It is highly likely that wildfire frequency, size, and intensity would increase over time throughout the city as result of climate change.

Wildfire Risk in San Bruno and the Project Site

The greatest potential for fire hazards in the City of San Bruno occurs in areas near extensive natural vegetation, specifically Crestmoor Canyon 0.6 mile north of the project site, Junipero Serra County Park across Interstate 280 from the project site, and San Francisco Public Utilities Commission's watershed on the west side of Skyline Boulevard. Dense stands of eucalyptus trees within the Rollingwood and Crestmoor neighborhoods also pose fire hazard potential (City of San Bruno 2008).

Crestmoor Canyon, about 0.6 mile northwest of the project site, is a steep, heavily vegetated canyon that originates at the intersection of San Bruno Avenue and Glenview Drive near Skyline Boulevard. San Bruno Creek flows through the canyon as part of the City of San Bruno's storm drain system and provides an ample water source for growing vegetation. The canyon is bounded by Crestmoor Drive, Claremont Drive, and Sneath Lane. The upper canyon is very steep and has dense vegetation. Residential neighborhoods surround the canyon ridgetops. Fire protection for Crestmoor Canyon is provided by the City of San Bruno Fire Department, which also oversees brush clearance in Crestmoor Canyon to minimize the potential fire hazard. There is also substantial residential development between the project site and Crestmoor Canyon.

According to CAL FIRE, the project site is located under the jurisdiction of an LRA (CAL FIRE 2016). As shown in Figure 3.18-1, the nearest very high FHSZ is approximately 0.6 mile west of the project site, extending west from Skyline Boulevard (CAL FIRE 2016), in the San Francisco Public Utilities Commission watershed. Although the project site itself is not located in a high FHSZ, densely wooded areas to the west of residential development could potentially pose a fire risk.

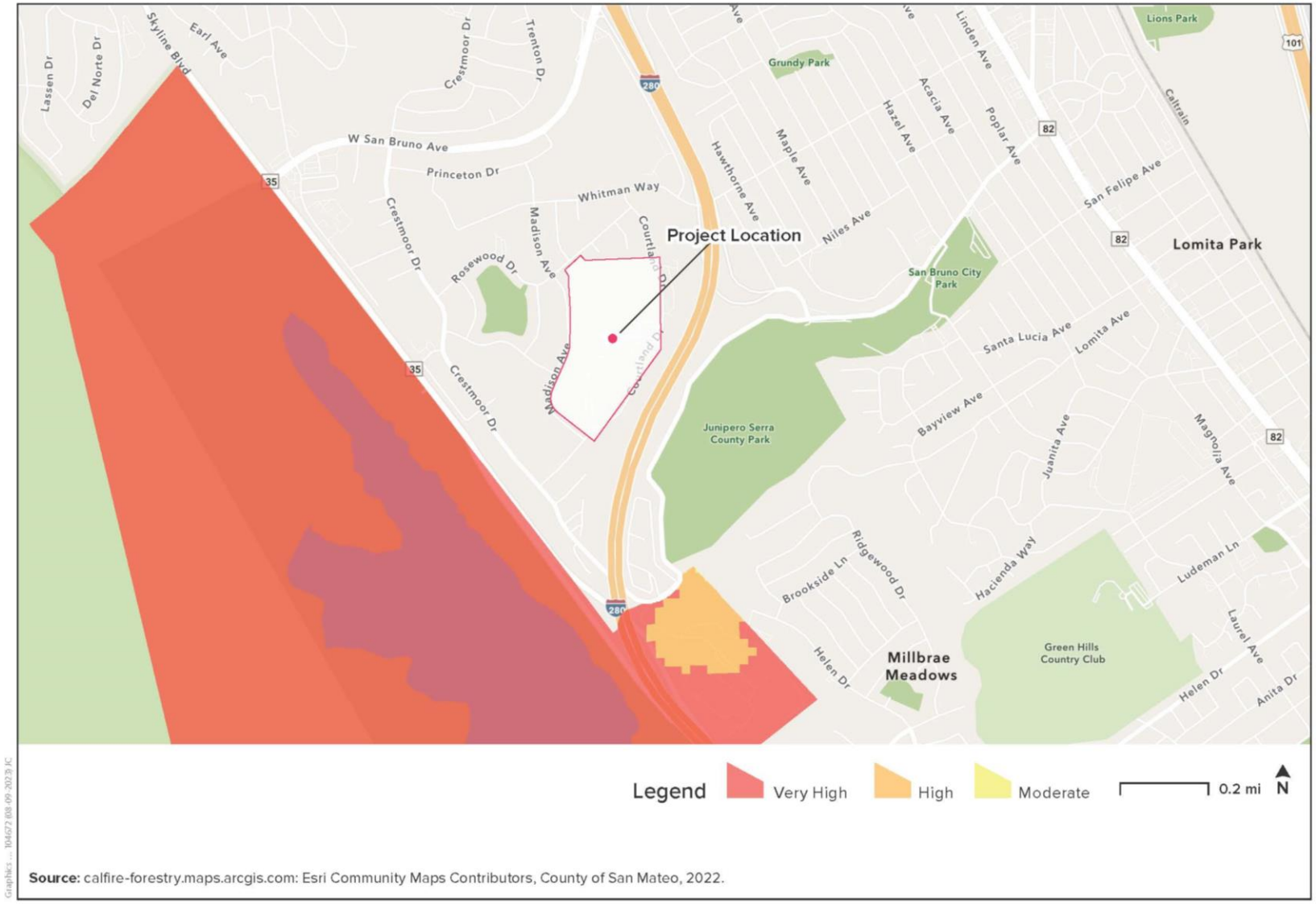


Figure 3.18-1. Fire Hazard Severity Zones

3.18.2 Environmental Impacts

Methods for Analysis

This section describes the methods for analyzing the impacts of implementing the project. Criteria from Appendix G of the State CEQA Guidelines were used to determine whether the project would have a significant impact related to wildfire. Although Appendix G limits the evaluation to near SRAs or lands classified as very high FHSZs, this EIR takes a broader look at wildfire impacts and evaluates all areas for potential impact. Impacts related to wildfire were assessed based on review of applicable documents such as the San Bruno General Plan and its EIR, as well as other local planning documents.

Although it is foreseeable that the existing leagues that use the fields would continue to use the field once improved, the City also anticipates that other groups would use the facilities in the future, thereby potentially increasing use of the facilities. Use of the field generally does not involve activities that exacerbate wildfire hazard. Therefore, the potential for increased use, which is currently undefinable, is not analyzed further.

Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the proposed project, if located in or near SRAs or lands classified as very high FHSZs, would be considered to have a significant effect if it would result in and of the following.

- Impact WF-1: Substantial impairment of an adopted emergency response plan or emergency evacuation plan.
- Impact WF-2: As a result of slope, prevailing winds, or other factors, the exacerbation of risks of and exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Impact WF-3: Installation or maintenance of project-associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment.
- Impact WF-4: Exposure of people or structures to significant risks such as downslope or downstream flooding or landslide as a result of runoff, postfire slope instability, or drainage changes.

Impacts and Mitigation Measures

Impact WF-1: Would the project substantially impair an adopted emergency response plan or emergency evacuation plan? (Less than Significant)

Construction

A short-term increase in traffic would occur due to construction-related activities but would not result in a substantial increase in traffic that would interfere with an adopted emergency response plan or emergency evacuation plan.

Project construction would require the temporary road closure of Courtland Drive during reconfiguration of the road. However, access would still be maintained to the project site for emergencies because it would be accessible for construction activities, and there are alternative routes through nearby neighborhoods that would provide the same access in the area in the case of evacuation and emergencies. For example, access from north of the project area to south of the project area would still be available via Madison Avenue. In addition, the project site currently has no residents. There could be recreational visitors if homes are constructed when the residential fields are still available for use. However, there would also be no recreational users when the recreational field is under construction, which would be most (around 12 months) of the 21-month construction period. If recreational users have access to the field during construction and there is a wildfire, they would also be able to exit the field area in the same way they entered the site. Construction conditions of the proposed project and project variant would be the same, so that impacts would also be the same. There would be **no impact** related to evacuation or emergency response during construction.

Operation

Vehicular circulation would be provided to the project from Piedmont Avenue at its southern entrance and Courtland Drive at its northern entrance Courtland Drive would be a private road with a public right-of-way, similar to current conditions. The project would not include any changes to existing public roadways that provide emergency access to the site or surrounding area. Existing easements provide access to the church and would continue to do so. Additionally, an existing easement that provides the California Department of Transportation (Caltrans) with access to adjacent Interstate 280 property would be replaced to reflect the new alignment of Courtland Drive.

Development of homes would increase traffic in the area, although the use of the sports fields is expected to have the same maximum number of attendees per game so that traffic at any given time should be similar to baseline conditions. The project's design includes a ring road that provides circulation within the outer portions of the residential component of the project site, with east/west drives throughout; this road would provide interior access and evacuation routes. Two common area parcels located along the western portion of the project site would provide access for the fire department and to homeowner's association maintenance contractors to the natural open space parcel and for ongoing maintenance and site safety. In addition, the project would be designed to comply with requirements for emergency vehicle access. The variant would have the same design aspects as described for the proposed project and would therefore have the same impacts. The impact would be **less than significant**.

Impact WF-2: Would the project, due to slope, prevailing winds, or other factors, exacerbate risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? (Less than Significant)

Construction

Project construction could increase potential exposure to wildfire due to increased ignition risks. Project construction would include a construction crew that would utilize typical construction equipment (i.e., scraper/blade, backhoes, and rollers) powered by gasoline or diesel fuel. Use of construction equipment has the potential to cause sparks. There would also be the potential to exacerbate wildfire risk if construction workers smoke on site.

Sparks originating from construction activities have the potential to ignite vegetation or other materials on or adjacent to the project site, or to spread to the surrounding very high and high FHSZs located adjacent to the west of the project site. While the project site and vicinity contain vegetation, the project site and vicinity are mostly developed and do not contain extensive amounts of vegetation, flammable vegetation, or other materials that have a high risk of ignition by sparks from construction activities or personnel. Additionally, the project site is flat and does not contain other factors, such as excessive slopes, that are known to exacerbate wildfire risks. Impacts under both the project and project variant would be **less than significant**.

Operation

Project operations could increase potential exposure to wildfire due to increased ignition risks, such as activities like lawn mowing, and other similar activities. Malfunction of electricity/lighting and heating/cooling systems or equipment can produce sparks that have the potential to ignite project structures. There would be no natural gas use as part of the proposed project. To minimize any susceptibility to fire hazards the project would adhere to the 2022 California Building Code Chapter 9, *Fire Protection Systems*; and the California Fire Code Chapter 6, *Building Services and Systems*, Chapter 7, *Fire and Smoke Protection Features*, and Chapter 10, *Means of Egress*. The project site is located in an urban area that is not especially susceptible to fire hazards. Topography is relatively flat where residences and the field would be located, and would not contain extensive vegetation susceptible to fires or other factors known to exacerbate wildfire risks. Implementation of all applicable codes and safety standards would minimize fire risks. While the residential area is adjacent to natural areas, the proposed project and variant contain a 70-foot area zoned and maintained as defensible space. Two egress points would be maintained at the north and south of the project site from Courtland Drive would be maintained by the City under the proposed project. Two common area parcels located along the western portion of the project site would provide access for the fire department and to homeowner's association maintenance contractors to the natural open space parcel and for ongoing maintenance and site safety. The vegetated open space area would be managed according to a vegetation management program (Appendix H, *Vegetation Management Plan*), which would reduce wildfire risk. Project components related to fire risk would be the same as the project variant. Impacts would be **less than significant**.

Impact WF-3: Does the project require the installation or maintenance of project-associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment? (Less than Significant)

Construction

The proposed project and project variant would not have temporary infrastructures such as roads, fuel breaks, emergency water sources, or power lines. The electricity consumption during construction is not known but it is common for electricity to be used during construction, in which case existing infrastructure would be used. There would be no project-associated utility or other infrastructure that would temporarily exacerbate wildfire risk under the proposed project or variant during construction. There would be **no impact**.

Residential Component Operation

The residential component of the project would be designed to the 2022 California Building Standards and Fire Codes as amended by the City of San Bruno. The project would not require the installation or maintenance of any infrastructure that would exacerbate fire risk. There would be no change to offsite utilities, and new onsite facilities would be connected to new services through the installation of underground utilities. The project, including infrastructure upgrades, would be completed in conformance with the California Building Code. While the residential area is adjacent to natural areas, the proposed project and variant contain a 70-foot area zoned and managed as defensible space. Therefore, impacts of the project and variant related to the installation or maintenance of facilities and associated wildfire risk and environmental impacts would be **less than significant**.

Recreation and Open Space Component Operation

Impacts related to wildfire risk and ongoing environmental impacts from project-related installation or maintenance of infrastructure under the recreation and open space component would be similar to those described for the overall project. In the proposed project, the homeowner's association would implement a wildfire management vegetation management plan (Appendix H, *Vegetation Management Plan*) within the wooded slope area, and in the variant, the City would implement a wildfire management vegetation management plan within the portion of the wooded slope area dedicated to the City (or in conjunction with the homeowner's association if maintenance is provided by them). Vegetation management under both the proposed project and the variant would reduce wildfire risk around the site. Therefore, project-related installation or maintenance of associated infrastructure would not exacerbate fire risk or result in temporary or ongoing environmental impacts. The variant would have the same recreation and open space aspects as described for the proposed project and would therefore have the same impacts. The impact would be **less than significant**.

Impact WF-4: Would the project expose people or structures to significant risks such as downslope or downstream flooding or landslide as a result of runoff, postfire slope instability, or drainage changes? (No Impact)

The City of San Bruno has adopted safety restrictions for grading from the 2022 California Building Standards Code, as well as General Plan policies and other regulations to control construction in landslide-prone areas to minimize the exposure of people and structures to these risks. As discussed in more detail in Section 3.6, *Geology, Soils, and Seismicity*, and Section 3.9, *Hydrology and Water Quality*, General Plan policies require specific design requirements to minimize risk of exposure to geologic and hydrologic hazards, including flooding, landslides, runoff, and drainage changes. Furthermore, the City of San Bruno Fire Department has developed the San Bruno Local Hazard Mitigation Plan Annex, which includes strategies to reduce the loss of life, personal injury, and property damage that can result from disasters, including wildfire. The plan includes a hazards and risk assessment for urban land exposure, infrastructure exposure, and facilities and schools. It also sets the ongoing and future mitigation goals and priorities related to wildfire.

Under the proposed project, the homeowner's association would be responsible for maintaining all streets in the neighborhoods, stormwater treatment areas and infrastructure, architectural street lighting, common area landscaping, and front yard landscaping; and the City would be responsible for maintenance of the dedicated area containing the recreational facilities and the area along

Courtland Drive for recreational supportive uses. The homeowner's association would manage the wooded slopes. Under the variant, the City (or the homeowner's association) would be responsible for the maintenance of the portion of the dedicated 6.47 acres, which includes sloped areas and fire management within the dedicated sloped areas. Under the variant, the homeowner's association would maintain 7.51 acres of wooded slope. The vegetated area west of the residential development would be maintained but would not change the slope, and maintenance would increase fire prevention, thus reducing the risk of fire and postfire impacts. The variant would have the same design aspects as described for the proposed project and would therefore have the same impacts. The project would not expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of postfire slope instability or drainage changes, and there would be **no impact**.

Chapter 4
Alternatives Analysis

4.1 Introduction

This chapter describes alternatives to the proposed project that were developed pursuant to the California Environmental Quality Act (CEQA). State CEQA Guidelines Section 15126.6 provides the following guidance for treatment of project alternatives in the Environmental Impact Report (EIR).

- There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason. An EIR need not consider every conceivable alternative to a project. (State CEQA Guidelines Section 15126.6(a)).
- The range of alternatives to the project shall include those that are potentially feasible, attain most of the basic objectives of the project, and avoid or substantially lessen any of the significant effects of the project (State CEQA Guidelines Section 15126.6(a)).
- The State CEQA Guidelines require that the EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project, though the alternatives need not be analyzed to the same extent as the proposed project. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project as proposed (State CEQA Guidelines Section 15126.6[d]).
- The State CEQA Guidelines require that the "no project" alternative be considered (State CEQA Guidelines Section 15126.6[e]). The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving a proposed project with the impacts of not approving the proposed project. If the no project alternative is the environmentally superior alternative, CEQA requires that the EIR "…shall also identify an environmentally superior alternative among the other alternatives." (State CEQA Guidelines Section 15126[e][2]).

In addition to the no project alternative, this chapter identifies additional alternatives and discloses the impacts of each. This chapter also provides a description of the alternatives and compares the significant environmental impacts of the alternatives to the significant environmental impacts of the Project as proposed. The chapter concludes with a summary of the environmentally superior alternative.

4.2 Methodology for Selection of Alternatives

4.2.1 Potential Feasibility

An EIR must "consider a range of potentially feasible alternatives" (State CEQA Guidelines Section 15126.6(a)). State CEQA Guidelines Section 15126.6(f) (1) explains "feasibility" (e.g., "… feasibly attain most of the basic objectives of the project …"), in part, as follows:

Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

Although, as noted above, EIRs must contain a discussion of "potentially feasible" alternatives, the ultimate determination as to whether an alternative is definitively feasible or infeasible is made by the lead agency's decision-making body, here the City of San Bruno (City). (See Public Resources Code [PRC] Sections 21081.5, 21081[a] [3].) As a result, the EIR only concludes whether an alternative is potentially feasible.

4.2.2 Attainment of Project Objectives

One factor that must be considered in selection of alternatives is the ability of a specific alternative to attain most of the basic objectives of the project (State CEQA Guidelines Section 15126.6[a]). The project objectives are identified in Chapter 2, *Project Description*, and listed here.

1. Redevelop an underutilized site with a residential neighborhood that provides a variety of home sizes at a density that is compatible with the surrounding neighborhood.
2. Provide housing at a range of income levels (including low- and moderate-income households) that would assist the City of San Bruno in meeting its Regional Housing Needs Allocation (RHNA) targets.
3. Develop a project that is compatible with the existing biological setting and that provides improved management of preserved open space.
4. Provide wildland fire protection and maintenance of existing wooded areas.
5. Provide recreational fields and other public facilities and amenities to provide recreational opportunities, including providing for evening uses to maximize availability of the fields and facilities.

4.3 Potential to Avoid or Substantially Reduce a Significant Impact

Alternatives considered in an EIR must avoid or substantially lessen any of the significant effects of the proposed project (State CEQA Guidelines Section 15126.6(a)). Sections 3.1 through 3.16 of this Draft EIR address the environmental impacts of implementation of the proposed project and project variant.

The following significant impacts were identified for the proposed project and project variant.

- **Impact BIO-1:** A substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
- **Impact BIO-5:** Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

- **Impact CUL-2:** Potential to cause a substantial adverse change in the significance of an archaeological resource, or potential disturbance to undiscovered archaeological resources (State CEQA Guidelines Section 15064.5).
- **Impact GEO-5:** Direct or indirect destruction of a unique paleontological resource or site or unique geologic feature.
- **Impact GHG-1:** Generation of greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- **Impact GHG-2:** Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.
- **Impact HAZ-5:** Placement of project-related facilities within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project area.
- **Impact NOI-1:** Generation of increased ambient noise levels in the project vicinity in excess of applicable standards.
- **Impact TRA-2:** Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b).
- **Impact TCR-1:** Cause a substantial adverse change in the significance of a tribal cultural resource that is a) listed or eligible for listing in the California Register of Historic Resources (CRHR) or in a local register of historical resources, as defined in PRC Section 5020.1(k), or b) determined by the lead agency to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1.

4.4 Comparison and Analysis of Alternatives

The following discussion summarizes the alternatives evaluated and why they meet CEQA requirements for consideration of alternatives. The discussion also provides an evaluation of the alternative. The following two alternatives are evaluated in this Draft EIR.

- Alternative 1: Increased Density with ADUs, Open Space, and Recreation
- Alternative 2: Reduced Density with Open Space and Recreation

Further details on these alternatives, and an evaluation of environmental effects relative to the proposed project, are provided below.

4.4.1 Alternative 1: Increased Density with ADUs and Open Space and Recreation

Summary

As explained below, this alternative is considered because it would meet all of the project objectives, is potentially feasible, and would substantially reduce the vehicle miles traveled (VMT)-related greenhouse gas (GHG) and transportation impacts of the proposed project and variant.

Description of Alternative

The project site was included as a housing opportunity site in the City of San Bruno Housing Element 2015–2023, adopted in April 2015 (City of San Bruno 2015). At a unit density of 8.0 units per acre consistent with the *San Bruno General Plan* (General Plan) (City of San Bruno 2009) designation for the project site, the maximum capacity for the site is approximately 321 units. Increasing density can reduce per-capita VMT. In an effort to identify the number of units at which per capita VMT would decrease, Fehr & Peers determined that a density of at least 9.5 dwelling units per acre on the developed portion of the project site (about 30.26 acres[1]) would be needed to start to reduce VMT on the site (Fehr & Peers pers. comm.).[2] This equates to a total of 287 units. There would be 242 homes for the effective density of 8 dwelling units per acre for compatibility with the density allowed under the General Plan designation across the 30.26 developed acres, and the additional 45 units would be accessory dwelling units (ADUs) distributed throughout the project site. It is presumed these would be constructed at the same time as the houses.

The 287 units constructed under the Alternative 1 would be located within two neighborhoods, as proposed under the project. Although the density is compatible with that allowed under the General Plan, to accommodate the increased density and ADUs, the proposed residential development would be denser, with smaller setbacks, smaller lots, and smaller dwelling unit areas. Homes would likely be three stories instead of two and arranged in a clustered development pattern.

In accordance with the City's Affordable Housing Program (AHP), this alternative includes onsite below market rate (BMR) homes spread throughout the two neighborhoods. The recreational and open space component of the proposed project would be the same under this alternative. Site access, circulation, landscaping, and infrastructure upgrades would be the same as proposed under the project, though it is unknown whether additional utility capacity may be needed to account for increased units compared to the proposed project and variant. Although more housing units would be constructed under this alternative, it is assumed that a similar amount of ground disturbance and grading would occur as the proposed project because this alternative would have the same project site as the proposed project.

Evaluation of Alternative

Meeting Most of the Basic Project Objectives

This alternative would meet most of the basic project objectives. Like the proposed project, it would redevelop an underutilized site with a high-quality residential neighborhood and provide housing at a range of income levels (including low- and moderate-income households) that would assist the City in meeting its RHNA targets. Alternative 1 would also have open-space areas like the proposed project, such that it would be compatible with the existing biological setting and provide improved management of preserved open space. The open space would also be maintained, providing wildland fire protection and maintenance of existing wooded areas. Finally, the recreation component in Alternative 1 would be the same, such that the alternative would provide recreational

[1] The streets, lots, and private open space in the proposed project total 33.28 acres, while in the variant they are 27.23 acres. The average of these is 30.26 acres, which is used for this alternative in defining the number of units.

[2] In determining the number of ADUs to include in this alternative, the City looked to a recent project in the City of Milpitas that contained 78 townhome condominiums, 12 of which would have an ADU (City of Milpitas 2023). This is an ADU-to-home ratio of about 15 percent. For Alternative 1, the ADU-to-home ratio would be about 18 percent, already greater than the reference project.

fields and other public facilities and amenities to provide recreational opportunities, including providing for evening uses to maximize use of the fields and facilities. As a result, Alternative 1 would meet all of the project objectives.

Potential Feasibility

This alternative is potentially feasible and could be constructed considering technical, legal, environmental, and economic factors.

Comparison of Impacts

This alternative would result in the following impacts compared to the proposed project and project variant.

- **Aesthetics.** At the recreational fields, the light and glare impacts under this alternative would be the same as the proposed project and project variant because the field lighting would be the same. This alternative would include more housing, which would result in smaller setbacks and less open space and landscaping, and a clustered development layout, which may have a different appearance from other nearby neighborhoods with larger lot sizes or multifamily development. However, the overall look of the alternative would still be of high visual quality. There would also be more windows on site. Home windows typically do not produce substantial glare, however, and impacts would be similar to the proposed project and project variant. Additionally, due to the steep terrain and intervening mature trees, aesthetic and visual resource impacts are highly localized and mainly restricted to the project site. Therefore, aesthetic impacts would be **similar** to the proposed project and project variant.
- **Air quality.** Alternative 1 would require similar construction activities as the proposed project and project variant as well as similar use of the recreation field. The alternative is not expected to affect the intensity of construction on any one day; therefore, the same level of air quality impacts would occur as under the proposed project and project variant. There would be more total emissions; however, because there would be more construction associated with the higher number of units, which could increase concentrations of pollutants during construction. Increased density would result in incrementally more vehicle trips and emissions during operation. Therefore, this alternative would result in **slightly greater** impacts compared to the proposed project and project variant, due to the increase in the number of units.
- **Biological resources.** Construction and operation of the proposed project and project variant could affect the San Francisco dusky-footed woodrat, bats, and nesting birds. Because construction and operation impacts of Alternative 1 would be similar to the proposed project and project variant and occur within the same footprint, this alternative would similarly affect special-status species and nesting birds. The same mitigation would apply. In addition, similar to the proposed project and project variant, construction of Alternative 1 has the potential to damage heritage trees through the installation of utilities and construction of new homes. To reduce impacts during construction and operation on special-status species, nesting birds, and heritage trees, the same mitigation measures as the proposed project and project variant (Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-5) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Cultural resources.** This alternative would require similar construction activities as the proposed project and project variant and would have the same project site as the proposed

project. The impacts of the proposed project and project variant related to unearthing previously undiscovered resources would still occur under this alternative. The same mitigation (Mitigation Measures CUL-2a and CUL-2b) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.

- **Energy.** As with the proposed project and project variant, Alternative 1 would result in an increased demand for energy as a result of residential components and uses, such as heating, cooling, and landscaping activities. Due to a higher number of homes developed under this alternative, Alternative 1 would result in a higher energy demand compared to the proposed project and project variant. However, this alternative would likely incorporate energy-saving features during construction and operation, similar to the proposed project and project variant, which would result in compliance with adopted state and local renewable energy or energy efficiency regulations and plans. Therefore, this alternative would result in **slightly greater** impact compared to the proposed project and project variant.
- **Geology, soils, and paleontological resources.** This alternative would require similar construction activities as the proposed project and project variant and would have the same project site as the proposed project and project variant. The impacts of the proposed project and project variant related to erosion and other geologic impacts would still occur under this alternative. The same mitigation (Mitigation Measure GEO-5) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Greenhouse gas emissions.** Similar to the proposed project and project variant, Alternative 1 would not be consistent with all Bay Area Air Quality Management District (BAAQMD) land use Threshold Option A design elements, because the alternative would not achieve a reduction in project-generated VMT of 15 percent below the regional average. This alternative would develop a similar Transportation Demand Management (TDM) program as the proposed project and project variant (Mitigation Measure TRA-2) but would still result in a significant and unavoidable GHG impact. However, as described for transportation impacts below, the higher density of Alternative 1 would reduce per-capita VMT compared to the proposed project and project variant, which would result in a **substantial reduction** in the significant VMT-related GHG impacts, even though impacts would remain significant and unavoidable.
- **Hazards and hazardous materials.** Alternative 1 would require similar construction activities as the proposed project and project variant. As a result, similar types of hazardous materials would be used onsite, transported, and disposed of at any given time under this alternative. The potential to encounter contaminated soils would be the same as under the proposed project because the project site would be the same. This alternative would have the same tall lighting structures as the proposed project and project variant and would result in the same potential safety hazard related to airports. The same mitigation (Mitigation Measures HAZ-5a and HAZ-5b) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Hydrology and water quality.** Alternative 1 would have similar impacts on hydrology and water quality as the proposed project and project variant. This alternative would be located at the same project site as the proposed project and project variant; therefore, it would result in similar levels of ground disturbance to the proposed project and project variant. Similar to the proposed project, Alternative 1 would increase stormwater runoff due to an increase in impervious surfaces. There may be more impervious surfaces due to the greater number of

housing units, but the stormwater system would be designed to the same standard as the proposed project. As with the proposed project and project variant, this alternative would include stormwater treatment basins and onsite detention that would be designed to appropriate standards, as well as compliance with water quality standards and waste discharge requirements. The recreational fields would result in the same amount of runoff as the proposed project. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.

- **Land use and planning.** Similar to the proposed project and project variant, Alternative 1 would require General Plan and zoning ordinance amendments regarding the preservation of open space and playing fields at the project site. Upon implementation of the amendments, this alternative would be consistent with the General Plan and would result in no environmental impacts related to any inconsistencies with the General Plan. In addition, Alternative 1 would be consistent with the Airport Land Use Compatibility Plan, similar to the proposed project and project variant. This alternative would also better support *Plan Bay Area 2050* (ABAG and MTC 2021) than the proposed project due to the increase in housing units. In general, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Noise.** Alternative 1 would include 287 units, which is more than the proposed project's 155 units. Construction activities would be the same as the proposed project but would last longer, resulting in longer noise and vibration impacts of the same noise and vibration levels as construction of the proposed project and project variant. The same mitigation (Mitigation Measures NOI-1a and NOI-1b) would apply. Noise during operations would be the same in the recreational component and would be similar in the residential component. Noise during operations could be slightly greater due to the increased density and presence of more residents onsite. Therefore, noise impacts would be **greater** than the proposed project.
- **Population and housing.** Alternative 1 would include 287 units, resulting in an onsite population of approximately 718 residents based on 2.5 residents per unit (see Section 3.12, *Population and Housing*), which is more than the proposed project and project variant. Similar to the proposed project and project variant, this alternative would induce population growth by creating housing opportunities in excess of what are currently available. Although this alternative would result in more residents than the proposed project and project variant, this increase would be lower than the level of development currently projected by the Association of Bay Area Governments for the region and anticipated in the Housing Element adopted in 2023 and contemplated in the General Plan (see discussion regarding public services). Therefore, impacts related to population and housing and unplanned growth would be **similar** to the proposed project and project variant.
- **Public services.** Alternative 1 would increase the San Bruno service population by 718 persons, which could increase the number of calls for fire protection and emergency and police services. The increase in residents would also generate new students and library users. However, the increase in residents is unlikely to negatively affect service ratios, response times, school enrollment, or other performance objectives compared to the proposed project and project variant, because this growth is contemplated in the General Plan. The General Plan, which plans for long-term needs for public services, projected a population of 44,864 residents by 2025 (City of San Bruno 2009). Current projections indicate that growth will not meet that pace and that the population will be 43,835 by 2030 (see Table 3.12-2). This indicates that even with additional population beyond that considered in the site's General Plan designation, such growth is still within the envelope of the growth contemplated in the General Plan. As a result,

like the proposed project and project variant, Alternative 1 would not require new or modified physical facilities for public services. Therefore, impacts would be **similar** to the proposed project and project variant.

- **Recreation.** Alternative 1 would have the same recreational component of the proposed project and project variant, so related impacts of construction of recreational facilities would be the same. Additionally, Alternative 1 would contribute the same amount of recreational facilities as the proposed project or project variant such that parkland impacts would also be the same as the proposed project and project variant. While there may be a greater population on site than under the proposed project, the projected population of the City as shown in Table 3.14-2 would not change for 2026, and the conclusion would be the same regarding sufficient parkland. As a result, recreation impacts would be **similar** to the proposed project and project variant.
- **Transportation.** Alternative 1 would have the same circulation components and would, therefore, have similar impacts to the proposed project and project variant related to programs, policies, plans, and ordinances pertinent to the circulation system, as well as hazards and emergency access. Alternative 1 would not achieve a reduction in project-generated VMT of 15 percent below the regional average. However, the higher density of Alternative 1 would reduce VMT by about 1 percent compared to the proposed project. VMT reduction is a key component to reduction of GHG emissions in California. As stated in the Governor's Office of Planning and Research's *Technical Advisory on Evaluating Transportation Impacts in CEQA* (OPR 2018) (footnotes removed):

  > The transportation sector has three major means of reducing GHG emissions: increasing vehicle efficiency, reducing fuel carbon content, and reducing the amount of vehicle travel. The California Air Resources Board (CARB) has provided a path forward for achieving these emissions reductions from the transportation sector in its 2016 Mobile Source Strategy. CARB determined that it will not be possible to achieve the State's 2030 and post-2030 emissions goals without reducing VMT growth. Further, in its 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB found that despite the State meeting its 2020 climate goals, "emissions from statewide passenger vehicle travel per capita [have been] increasing and going in the wrong direction," and "California cannot meet its [long-term] climate goals without curbing growth in single-occupancy vehicle activity."1 CARB also found that "[w]ith emissions from the transportation sector continuing to rise despite increases in fuel efficiency and decreases in the carbon content of fuel, California will not achieve the necessary greenhouse gas emissions reductions to meet mandates for 2030 and beyond without significant changes to how communities and transportation systems are planned, funded, and built.

  The per capita VMT is 14.7 daily miles per resident. A 1 percent reduction in that VMT would result in per capita VMT of 14.6 daily miles per resident. While this impact would not be reduced to less than significant, 14.6 is also the existing regional VMT. Therefore, for the purposes of this EIR and given the context of VMT, the reduction in VMT under Alternative 1 is considered a **substantial reduction** in the significant VMT-related impacts. This would not reduce impacts to less than significant, however, and the same mitigation (Mitigation Measure TRA-2) would apply.
- **Tribal cultural resources.** Alternative 1 would require similar construction activities as the proposed project and project variant and would have the same project site. The impacts of the proposed project and project variant related to unearthing previously undiscovered tribal cultural resources would still occur under this alternative. The same mitigation (Mitigation Measures CUL-2a and CUL-2b) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.

- **Utilities.** Alternative 1 would include 287 units, resulting in an onsite population of approximately 717 residents, which is more than the proposed project and project variant. Alternative 1 would increase use of utilities like water, electricity, and telecommunications. It would also generate more solid waste and wastewater, but given the additional capacity it is not foreseeable that additional facilities would be needed. Therefore, impacts under this alternative would be slightly **greater** than the proposed project and project variant.
- **Wildfire.** Alternative 1 would require similar construction activities as the proposed project and project variant and would have the same project site. The impacts of the proposed project and project variant, such as potential ignition risks and exacerbation of wildfire hazards, would still occur under this alternative. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.

4.4.2 Alternative 2: Reduced Density with Open Space and Recreation

Summary

As explained below, this alternative is considered because it would meet all of the project objectives, is potentially feasible, and would substantially reduce the construction noise impacts of the proposed project and variant.

Description of Alternative

The project site is surrounded to the north, west, and south by existing single-family subdivisions. The average lot size for the existing surrounding neighborhoods is approximately 5,000 square feet. These lot sizes are larger than the lot sizes proposed under the project at 3,000 square feet in one neighborhood and 2,850 and 3,375 square feet in the other neighborhood. Assuming an average lot size of 5,000 square feet, to be consistent with the density of the existing neighborhoods, Alternative 2 would result in 112 units at the project site.[3] In accordance with the City's AHP, this alternative includes BMR homes spread throughout the two neighborhoods.

The recreational and open space component of the proposed project would remain the same under Alternative 2. For the purposes of this analysis, site access, circulation, landscaping, and utilities and infrastructure upgrades would be the same as under the proposed project.

Evaluation of Alternative

Meeting Most of the Basic Project Objectives

Alternative 2 would meet all of the project objectives, similar to the proposed project and project variant. Alternative 2 would redevelop an underutilized site with a high-quality residential neighborhood and recreational fields for daytime and evening uses. Alternative 2 would provide housing at a range of income levels and assist the City in meeting its RHNA targets. While the proposed project would include 155 units, this alternative would provide 112 units, thereby resulting in less of a contribution to the RHNA goals than the proposed project. Alternative 2 would offer a variety of home sizes at a range of sales prices and meet the market demand in the City,

[3] 12.83 total developable acres for housing units/average of 5,000 sf for each residential parcel = 112 units.

consistent with the project sponsor's objectives. Similar to the proposed project and project variant, this alternative would provide wildland fire protection, maintain existing wooded areas, and be compatible with the existing biological setting, while managing preserved open spaces. This alternative would, therefore, meet all of the project objectives.

Potential Feasibility

Alternative 2 is considered potentially feasible and could be constructed considering technical, legal, environmental, and economic factors.

Comparison of Impacts

Alternative 2 would have the following impacts compared to the proposed project.

- **Aesthetics.** At the recreational fields, the light and glare impacts under Alternative 2 would be the same as the proposed project and project variant because the field lighting would be the same. Although there would be fewer housing units than the proposed project and project variant, windows on houses tend not to be a substantial source of light and glare, and impacts would not differ. This alternative would include less housing, which would result in greater setbacks and more open space and landscaping. Due to the steep terrain and intervening mature trees, aesthetic and visual resource impacts are highly localized and mainly restricted to the project site. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Air quality.** Alternative 2 would have the same construction activities as the proposed project and project variant. The alternative is not expected to affect the intensity of construction on any one day; therefore, the same level of air quality impacts would occur as under the proposed project. There would be less total emissions, however, because there would be less construction associated with the lower number of units, which could decrease concentrations of pollutants during construction depending on construction scheduling. Decreased residents could result in fewer vehicle trips and emissions during operation. As a result, this alternative would result in **fewer** air quality impacts compared to the proposed project and project variant.
- **Biological resources.** Construction and operation of the proposed project and project variant could affect the San Francisco dusky-footed woodrat, bats, and nesting birds. Because construction impacts of Alternative 2 would be similar to the proposed project and project variant, this alternative would similarly affect special-status species and nesting birds. In addition, similar to the proposed project and project variant, construction of Alternative 2 has the potential to damage heritage trees through the installation of utilities and construction of new homes. To reduce impacts during construction and operation on special-status species, nesting birds, and heritage trees, the same mitigation measures as the proposed project and project variant (Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-5) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Cultural resources.** Alternative 2 would require similar construction activities as the proposed project and project variant and would have the same project site, even with the reduction in housing units and reduced ground disturbance. The impacts of the proposed project and project variant related to unearthing previously undiscovered resources would still occur under this alternative. The same mitigation (Mitigation Measures CUL-2a and CUL-2b) would apply.

Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.

- **Energy.** Similar to the proposed project and project variant, Alternative 2 would result in an increased demand for energy as result of residential components and uses, such as heating, cooling, and landscaping activities. Due to reduced housing development under this alternative, Alternative 2 would result in slightly lower energy demand compared to the proposed project and project variant. This alternative would likely incorporate energy-saving features during construction and operation, similar to the proposed project, which would ensure compliance with adopted state and local renewable energy or energy efficiency regulations and plans. Therefore, this alternative would result in **slightly reduced** impacts compared to the proposed project and project variant, due to the decrease in housing.
- **Geology, soils, and paleontological resources.** Alternative 2 would require similar construction activities as the proposed project and project variant. The significant impacts related to unearthing previously undiscovered paleontological resources would still occur, despite the reduction in ground disturbance and grading. As a result, this alternative would not avoid or substantially reduce a significant impact of the proposed project and project variant on paleontological resources and the same mitigation measure would apply. The same mitigation (Mitigation Measure GEO-5) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project.
- **Greenhouse gas emissions.** Similar to the proposed project and project variant, Alternative 2 would not be consistent with all BAAQMD land use Threshold Option A design elements, because the alternative would not achieve a reduction in project-generated VMT of 15 percent below the regional average, even with the reduction in housing units, as explained below for transportation. It could also increase per-capita VMT and, therefore, increase GHG emissions. This alternative would develop a similar TDM program as the proposed project and project variant (Mitigation Measure TRA-2) but would still result in a significant and unavoidable GHG impact. Therefore, this alternative would result in **increased** impacts compared to the proposed project.
- **Hazards and hazardous materials.** Alternative 2 would require similar construction activities as the proposed project and project variant. As a result, similar types of hazardous materials would be used onsite, transported, and disposed of under this alternative. The potential to encounter contaminated soils would be the same. The greatest risks include gasoline spillage, or other fuel spillages, during construction. In the event of an accident, no hazardous substances would be expected to be released in large quantities. Alternative 2 would have the same project site as the proposed project and project variant; it would result in the same potential safety hazard related to airports. The same mitigation (Mitigation Measures HAZ-5a and HAZ-5b) would apply. Therefore, this alternative would have **similar** impacts to the proposed project.
- **Hydrology and water quality.** Alternative 2 would result in similar impacts on hydrology and water quality as the proposed project and project variant. This alternative would have the same project site as the proposed project and project variant and would result in similar levels of ground disturbance when compared to the proposed project and project variant. Similar to the proposed project and project variant, Alternative 2 would increase stormwater runoff due to an increase in impervious surfaces. There may be less impervious surface area due to the fewer number of housing units, but the stormwater system would be designed to the same standard as the proposed project and project variant. As with the proposed project and project variant, this

alternative would include stormwater treatment basins and onsite detention that would be designed to appropriate standards, and would comply with water quality standards and waste discharge requirements. The recreational fields would result in the same amount of runoff as under the proposed project and project variant. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.

- **Land use and planning.** Similar to the proposed project and project variant, Alternative 2 would require General Plan and zoning ordinance amendments regarding the preservation of open space and playing fields at the project site. Upon implementation of the amendments, this alternative would be consistent with the General Plan (City of San Bruno 2009). In addition, Alternative 2 would be consistent with the Airport Land Use Compatibility Plan, similar to the proposed project. Alternative 2 would also contribute slightly less to the goals of *Plan Bay Area 2050* (ABAG and MTC 2021) than the proposed project due to the decrease in housing units. In general, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Noise.** This alternative would include 112 units, which is less than the proposed project's 155 units. Construction activities would be the same as the proposed project and project variant but would take place over a shorter construction window or require fewer daily construction hours, resulting in less noise and vibration impacts than the proposed project or project variant. Noise during operations would be the same in the recreational component and would be similar in the residential component. The same mitigation (Mitigation Measures NOI-1a and NOI-1b) would apply. Noise during operations could be slightly reduced due to the decreased density and presence of less residents onsite. Given that the proposed project's and project variant's noise impacts during construction would require a suite of measures to reduce noise, reduction of construction noise impacts would be a **substantial reduction** from than the proposed project or project variant.
- **Population and housing.** The proposed project and project variant include 155 housing units, resulting in an onsite population of approximately 388 residents. Alternative 2 would include 112 units, resulting in an onsite population of approximately 280 residents based on 2.5 residents per unit (see Section 3.12, *Population and Housing*), which is less than the proposed project and project variant. Similar to the proposed project and project variant, Alternative 2 would induce population growth by creating housing opportunities in excess of what is currently available. This increase in population would be lower than that of the proposed project or project variant and would be lower than the level of development currently projected by ABAG for the region and anticipated in the Housing Element adopted in 2023. Therefore, this alternative would result in a **slightly reduced** impact compared to the proposed project and project variant, due to the decrease in housing.
- **Public services.** Alternative 2 would increase the San Bruno Fire Department's service population by 280 persons, which could increase the number of calls for fire protection and emergency and police services. The increase in residents would also generate new students and library users. However, the increase in residents is unlikely to negatively affect service ratios, response times, school enrollment, or other performance objectives compared to the proposed project and project variant, because this growth is contemplated in the General Plan (City of San Bruno 2009), which plans for long-term needs for public services. As a result, like the proposed project and project variant, Alternative 2 would not require new or modified physical facilities for public services. Therefore, impacts would be **similar** to the proposed project and project variant.

- **Recreation.** Alternative 2 would have the same recreation component as the proposed project and project variant and related impacts would be the same. Additionally, Alternative 2 would contribute the same amount of recreational facilities as the proposed project or project variant such that parkland impacts would also be the same as the proposed project and project variant. As a result, recreation impacts would be **similar** to the proposed project and project variant.
- **Transportation.** Alternative 2 would have the same circulation components and would have similar impacts to the proposed project and project variant related to programs, policies, plans, and ordinances pertinent to the circulation system, as well as hazards and emergency access. This alternative would require similar construction activities as the proposed project and project variant. VMT generated by Alternative 2 could increase compared to the proposed project because decreased densities can increase VMT. The same mitigation (Mitigation Measure TRA-2) would apply but would not reduce impacts to less than significant. Therefore, impacts from VMT would be similar and **potentially greater** than the proposed project and project variant.
- **Tribal cultural resources.** Alternative 2 would require similar construction activities as the proposed project and project variant and would have the same project site. The impacts of the proposed project and project variant related to unearthing previously undiscovered tribal cultural resources would still occur under this alternative. The same mitigation (Mitigation Measures CUL-2a and CUL-2b) would apply. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.
- **Utilities.** Alternative 2 would include 112 units, resulting in an onsite population of approximately 280 residents, which is less than the proposed project and project variant. Therefore, this alternative would decrease use of utilities like water, electricity, and telecommunications, in comparison to the proposed project and would also generate less solid waste and wastewater. Therefore, impacts would be **slightly less** than the proposed project and project variant.
- **Wildfire.** Alternative 2 would require similar construction activities as the proposed project and project variant and would have the same project site. The impacts of the proposed project related to wildfire hazards and risk exacerbation would still occur under this alternative. Therefore, this alternative would result in **similar** impacts compared to the proposed project and project variant.

4.5 No Project Alternative

CEQA requires that an EIR evaluate a No Project Alternative and its impacts (State CEQA Guidelines Section 15126.6(e)(1)). The intent of this evaluation is to provide decision makers with information that will allow them to compare the effects of approving the proposed project with the effects of denying the proposed project. CEQA requires this evaluation of the No Project Alternative, whether or not it meets the alternatives screening criteria related to potential feasibility, objectives, and avoiding or substantially reducing a significant impact. The No Project Alternative includes "the existing conditions at the time the notice of preparation is published…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (State CEQA Guidelines Section 15126.6(e).

4.5.1 Description of Alternative

No additional construction would occur at the project site with implementation of the No Project Alternative. Under the No Project Alternative, the existing conditions at the project site would not change. The existing playing fields, parking lots, a storage lot, school facilities, school district maintenance facilities, and unimproved sloping wooded open space would remain. San Mateo Union High School District (SMUHSD) currently has a lease agreement of the Crestmoor fields with AYSO and Lowen from July 1, 2023, that expires on June 30, 2024, and use of the fields beyond that date would require separate action of the Board of Trustees (Hawkins pers. comm.). However, AYSO and Lowen's use of the recreation fields predated July 1, 2023, and the City is unaware of any intent by the SMUHSD to decline to approve another lease. Additionally, SMUHSD declared Crestmoor High School surplus property in March 2019, and prior to entering into a purchase agreement with the applicant had entered into a contract to sell the property with another developer (SMUHSD 2022). Therefore, should the City deny the project, it is reasonable to assume SMUHSD would continue to try to sell the property. However, actual development of the property is not included in the No Action Alternative because the characteristics, timing, and other details of such a development would be speculative. As a result, given past use by AYSO and Lowen, the No Project Alternative presumes that SMUHSD would continue to lease the playing fields on a short-term basis to private soccer clubs for youth soccer games and practices.

In addition to private league activities, informal use of the fields would continue to occur throughout the week, such as for walking, running, and other similar workouts. For the purposes of this analysis, it is assumed that the currently vacant high school campus would continue to remain vacant, rather than be leased as an educational facility (alternative high school and/or preschool).[4]

4.5.2 Evaluation of Alternative

The No Project Alternative would have the following impacts compared to the proposed project.

- **Aesthetics.** The No Project Alternative would maintain the site in its current conditions, no construction would occur on the project site, and activities occurring at the project site would not change. While the existing sports fields would continue to operate, no new field lighting would be installed. The existing unoccupied school facilities have undergone some natural degradation but have otherwise been maintained over the years by the District, and it is presumed that basic level of maintenance would continue. There would be no impact. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.
- **Air quality.** The No Project Alternative would not emit air pollutants above those already occurring on the project site, because there would be no construction and no changes to land use at the project site. There would be no impacts. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.
- **Biological resources.** The No Project Alternative would not result in tree removal, vegetation removal, building removal, or ground-disturbing activities because no construction would occur. Habitat conditions onsite would remain the same, and there would be no ongoing vegetation

[4] While the existing buildings have been leased in the past as educational facilities, there are no known future leases proposed in the event that the project is not implemented. Therefore, occupation of the existing buildings is not reasonably foreseeable and not included in the No Project Alternative.

management. Therefore, there would be no impacts on San Francisco dusky-footed woodrat, bats, nesting birds, or heritage tress. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.

- **Cultural resources; tribal cultural resources; geology, soils, and paleontological resources; hydrology and water quality.** The No Project Alternative would not result in ground-disturbing activities or modifications to the project site because no construction would occur. Therefore, this alternative would have no impact on these resources. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.
- **Energy, population and housing, public services, and utilities.** The No Project Alternative would not include new housing units or changes to the recreation fields; therefore, there would be no changes to the City's total residential population or housing supply at the project site. Because the No Project Alternative would not include housing or increased activity at the project site, the No Project Alternative would not increase demand for fire, police, emergency services, schools, or libraries, nor would it require utility services or additional energy consumption. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.
- **Greenhouse gas emissions.** The No Project Alternative would not emit GHGs from construction and operation. GHGs would continue to be emitted at the project site in association with existing maintenance and recreational activities. The No Project Alternative would have r**educed impacts** compared to the proposed project and project variant.
- **Hazards and hazardous materials.** The No Project Alternative would not involve use of hazardous materials for construction because no construction would be required. There would be no hazards associated with developing a site in proximity to an airport, because no new buildings would be located at the project site under this alternative. Any current use of hazardous materials at the project site for maintenance type activities would continue. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.
- **Land use and planning.** The No Project Alternative would not change land-use patterns at the project site and would not change the General Plan designation or zoning at the site. The proposed project also would not result in environmental impacts related to conflicts with land-use planning policies and ordinances. Therefore, the No Project Alternative and the proposed project would have the **same impacts**.
- **Noise.** The No Project Alternative would not result in noise-generating activities associated with construction and operation of the proposed project. Existing noise levels would continue at the project site as they currently occur from games, including from temporary light standards. Noise and vibration impacts associated with the proposed project are associated with the project's construction and with the new evening and nighttime uses at the playing fields, which would not occur under the No Project Alternative. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.
- **Recreation.** The No Project Alternative would not include housing or increased activity at the project site; therefore, this alternative would not increase demand for recreational facilities associated with new residents. The proposed project would result in fewer recreational fields compared to existing conditions. Under the No Project Alternative, all existing fields would remain, avoiding the temporary loss of fields during construction and permanent loss of one

field area. However, although the existing recreational facilities would continue to operate, the fields would not include lighting or other improvements to increase usage and accessibility. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.

- **Transportation.** Under the No Project Alternative, existing conditions at the project site would not change. Thus, there would be no conflicts with applicable plans, ordinances, or policies addressing the circulation system. Because the No Project Alternative would not implement any changes to the existing circulation system, there would be no impacts on transit facilities, bicycle facilities, or pedestrian facilities. The No Project Alternative would have **reduced impacts** compared to the proposed project and project variant.
- **Wildfire.** Although the project site itself is not located in a high fire hazard safety zone, densely wooded areas to the west of the residential component could pose a fire risk. The proposed project involves vegetation-management activities in this area; without the proposed project, vegetation would continue not to be managed in this area. Project construction and operation could increase potential exposure to wildfire due to increased ignition risks. Because of the lack of vegetation management, the No Project Alternative may result in **greater impacts** than the proposed project.

4.6 Environmentally Superior Alternative

State CEQA Guidelines Section 15126.6(e)(2) states that when the no project alternative is identified as the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives. As discussed previously in this chapter and shown in Table 4-1, the No Project Alternative would be environmentally superior for all environmental resource areas except wildfire. As a result, this EIR must identify an alternative among the other alternatives that is environmentally superior. Therefore, the City must balance environmental aspects in determining which alternative is the environmentally superior alternative. This also includes consideration of other factors, as explained below.

Alternative 2 would result in fewer impacts related to air quality, energy, noise, population and housing, and utilities. It would also increase VMT and VMT-related GHG impacts. Some of these impacts, such as for air quality and noise, would be related to construction activity and would be short term and temporary. While long-term impacts related to air quality would be less onsite, population and housing would need to occur elsewhere, where impacts may still occur. Similarly, population and housing and utilities impacts may be displaced under this alternative and occur somewhere other than the project site given the City's need to meet its RHNA target.

While Alternative 2 could increase VMT and VMT-related GHG impacts, Alternative 1 would result in fewer VMT impacts, which would reduce VMT-related GHG impacts. These impacts would be permanent, long-term, and significant and unavoidable impacts of the proposed project. Additionally, as described in the discussion of Alternative 1, the decrease of VMT is an important component of the state's GHG reduction policy. In summary, Alternative 2 would largely reduce construction impacts, could displace impacts to another site because housing would need to be built to meet the City's housing production goals, and could increase long-term VMT impacts. Alternative 1 would decrease long-term permanent VMT impacts, deemed critical to meeting GHG goals as described in the discussion of Alternative 1, above. Therefore, Alternative 1 is the environmentally superior alternative.

Table 4-1. Summary of Environmental Impacts of the Alternatives Relative to the Proposed Project

Environmental Topic	Impact under the Proposed Project	Alternative 1: Increased Density with ADUs and Open Space and Recreation	Alternative 2: Reduced Density Alternative	Environmentally Superior Alternative [a]
Aesthetics	Less than significant	Similar	Similar	Equal
Air Quality	Less than significant (with mitigation)	Greater	Less	Alternative 2
Biological Resources	Less than significant (with mitigation)	Similar	Similar	Equal
Cultural Resources	Less than significant (with mitigation)	Similar	Similar	Equal
Energy	Less than significant	Greater	Less	Alternative 2
Geology, Soils, and Paleontological Resources	Less than significant (with mitigation)	Similar	Similar	Equal
Greenhouse Gas Emissions	Significant and unavoidable	Less	Greater	Alternative 1
Hazards and Hazardous Materials	Less than significant	Similar	Similar	Equal
Hydrology and Water Quality	Less than significant	Similar	Similar	Equal
Land Use and Planning	No impact	Similar	Similar	Equal
Noise	Less than significant (with mitigation)	Greater	Less	Alternative 2
Population and Housing	Less than significant	Similar	Less	Alternative 2
Public Services	Less than significant	Similar	Similar	Alternative 2
Recreation	Less than significant	Similar	Similar	Equal
Transportation	Significant and unavoidable	Less	Greater	Alternative 1
Tribal Cultural Resources	Less than significant (with mitigation)	Similar	Similar	Equal
Utilities	Less than significant	Greater	Less	Alternative 2
Wildfire	Less than significant	Similar	Similar	Equal

[a] Alternatives have impacts similar to or greater than the proposed project, such that no alternative would reduce an environmental impact of the proposed project.

4.7 Alternatives Considered but Rejected

State CEQA Guidelines Section 15126.6(c) provides that an EIR should "identify any alternatives that were considered by the lead agency but rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination." The screening process for identifying the viable EIR alternatives included consideration of the following criteria.

- Ability to meet the basic project objectives.
- Potential ability to substantially lessen or avoid environmental effects associated with the proposed project.
- Potential feasibility, taking into account economic, environmental, social, technological, and legal factors.

The following discussion describes the alternatives that were considered during preparation and scoping for this EIR and provides the rationale for eliminating the alternatives from detailed consideration, such as a) they would not fulfill most of the basic objectives of the proposed project, b) they would not avoid or substantially lessen significant environmental impacts, or c) they would be infeasible.

4.7.1 Alternative Site Locations

State CEQA Guidelines Section 15126.6(f)(2) states that a Draft EIR must consider offsite alternatives if such alternatives reduce environmental impacts of the proposed project. As stated in State CEQA Guidelines, Section 15126.6(f)(1), factors that may be considered when a lead agency is assessing the feasibility of an alternative include:

> …site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (or the site is already owned by the proponent).

Residential Component

Alternative locations for the residential component of the proposed project are considered infeasible, particularly because the project sponsor is in contract to purchase this site, and develop a project that is compatible with existing zoning. An alternate location for single-family residential uses would, therefore, require land acquisition, which is not included in the project sponsor's plans or objectives. The plans and objectives of the proposed project cannot be realized at an alternative site.

The project site is currently underutilized compared to the existing surrounding land uses. Although the proposed project would be constructed on parcels of a similar size in proximity to the project site (e.g., South San Francisco, Millbrae), no alternative sites have been identified that could accommodate the proposed development, given the overall scarcity of land, as well as the existing land use and zoning designations. Furthermore, an offsite location would not allow the project sponsor to realize the objective of providing a residential project that responds to the City's market demands and to develop an economically viable and feasible project. The land is also currently

underutilized, presenting a rare opportunity to develop a large site in the City, which is mostly built out.

Therefore, because of the aforementioned issues related to site suitability, economic viability, acquisition and control, and inconsistency with project objectives, consideration of an alternative site for the project has been rejected. This EIR does not analyze an alternative with an offsite location for the residential component.

Recreation Component

Alternative locations for the recreation component of the proposed project are considered infeasible, particularly because Implementing Policy OSR-8 currently reads:

> During reuse of the former Crestmoor High School site (designated for single-family residential development), preserve the existing playing fields for recreational use per direction of the General Plan Update Committee

Although the proposed project includes a general plan amendment, even with the amendment the intent to preserve the playing fields remains. The City is also mostly built out, limiting potential other locations for recreation field development of the size and nature contemplated as part of the proposed project. Therefore, this EIR does not analyze an alternative with an offsite location for the recreation component.

4.7.2 Alternative 3: Increased Density with Recreation and Open Space Areas

Description

Alternative 3 would increase the density at the developed portion of the project site to 8 dwelling units per acre. The project site was included as a housing opportunity site in the *City of San Bruno Housing Element 2015–2023* (City of San Bruno 2015). At a unit density of 8.0 units per acre across the approximately 30.1 acres of the parcel to be developed, there would be 241 units. The 241 units would be located within two neighborhoods, as proposed under the project. However, to accommodate the maximum density, the proposed residential development would be denser, with smaller setbacks, lot lines, and dwelling unit areas. In accordance with the City's AHP, this alternative includes 38 onsite BMR homes spread throughout the two neighborhoods, with 19 BMR homes located in each neighborhood. The recreational and open-space component of the proposed project would remain the same under Alternative 3.

Rationale for Elimination

This alternative would meet most of the basic project objectives. Like the proposed project, it would redevelop an underutilized site with a high-quality residential neighborhood and provide housing at a range of income levels (including low- and moderate-income households) that would assist the City in meeting its housing production targets. Alternative 3 would also have open-space areas like the proposed project, such that it would be compatible with the existing biological setting and that provide improved management of preserved open space. The open-space areas would also be maintained, providing wildland fire protection and maintenance of existing wooded areas. Finally, the recreation component in Alternative 3 would be the same, such that the alternative would provide recreational fields and other public facilities and amenities to provide recreational

opportunities, including providing for evening uses to maximize use of the fields and facilities. As a result, Alternative 3 would meet all of the project objectives.

It is not clear if Alternative 3 would avoid or substantially reduce any significant impacts of the proposed project.

- **Impact BIO-1, Impact BIO-5:** Alternative 3 would have the same project site as the proposed project and would require the same kind of structure removal and vegetation removal as the proposed project, resulting in similar impacts to the proposed project.
- **Impact CUL-2, Impact GEO-5, Impact TCR-1:** Alternative 3 would have the same project site as the proposed project and would require the same kind of ground disturbance as the proposed project, resulting in similar impacts to the proposed project.
- **Impact GHG-1, Impact GHG-2, Impact TRA-2:** Although increased density can reduce VMT, the minimum density identified to begin to reduce VMT at the project site is 9.5 dwelling units per acre. Therefore, at 8 dwelling units per acre, Alternative 3 would not reduce VMT compared to the proposed project. Therefore, impacts from VMT, including GHG-related impacts, would be similar to the proposed project.
- **Impact HAZ-5:** Alternative 3 would have the same tall lighting structures as the proposed project and would result in the same potential safety hazard related to airports. Therefore, this alternative would result in similar impacts compared to the proposed project.
- **Impact NOI-1:** Construction activities under Alternative 3 would be the same as the proposed project but would last longer due to the greater number of units, resulting in a longer noise and vibration impact of the same noise and vibration levels as construction of the proposed project. Noise during operations could be slightly greater due to the increased density and presence of more residents onsite and could likewise impact more receptors. Therefore, noise impacts would be **greater** than the proposed project.

Therefore, Alternative 3 is dismissed because it does not avoid or substantially reduce a significant impact of the proposed project.

4.7.3 Alternative 4: Maximum Density Across Entire Project Site

Description

The project site is located on one parcel totaling 40.2 acres. Under Alternative 4, single-family housing would be constructed throughout the entire project site with a maximum density of 8.0 units per acre, resulting in approximately 321 units with a similar affordable housing ratio as the proposed project. No recreational fields would be developed; instead, that area would contain homes.

Rationale for Elimination

Alternative 4 would support the project objectives of providing a residential project that responds to the City's market demands and helping to meet the City's housing production goals. However, no sports fields would be developed under this alternative. Therefore, the objective of providing recreational fields and other public facilities and amenities to provide recreational opportunities would not be attained. Eliminating recreation at the project site would conflict with goals and

policies in the General Plan (City of San Bruno 2009), which is why the objective related to recreation is considered a necessary and critical project objective.

Additionally, it is not clear if Alternative 4 would avoid or substantially reduce any significant impacts of the proposed project.

- **Impact BIO-1, Impact BIO-5:** Alternative 4 would have the same project site as the proposed project and require the same kind of structure removal and vegetation removal as the proposed project, resulting in similar impacts to the proposed project.
- **Impact CUL-2, Impact GEO-5, Impact TCR-1:** Alternative 4 would have the same project site as the proposed project and require the same kind of ground disturbance as the proposed project, resulting in similar impacts to the proposed project.
- **Impact GHG-1, Impact GHG-2, Impact TRA-2:** The VMT generated by Alternative 4 would be similar to the proposed project, because the density would still not be great enough to reduce impacts. Therefore, impacts from VMT, including GHG-related impacts, would be similar to the proposed project.
- **Impact HAZ-5:** Alternative 4 would require similar construction activities as the proposed project. As a result, similar types and amounts of hazardous materials would be used onsite, transported, and disposed of under this alternative. The potential to encounter contaminated soils would be the same as under the proposed project because the project site would be the same. This alternative would have the same tall lighting structures as the proposed project and would result in the same potential safety hazard related to airports. Therefore, this alternative would result in similar impacts compared to the proposed project.
- **Impact NOI-1:** Construction activities under Alternative 4 would be the same as the proposed project but would last longer due to the greater number of units, resulting in a longer noise and vibration impact of the same noise and vibration levels as construction of the proposed project. These noise impacts may also affect more receptors given that there would be residences on the northern component of the project site under this alternative. Noise during operations could be slightly greater due to the increased density and presence of more residents onsite and could likewise impact more receptors. Therefore, noise impacts would be **greater** than the proposed project.

Therefore, this alternative is dismissed because it does not meet a critical objective of the proposed project and because it would not avoid or substantially reduce a significant impact of the proposed project.

4.7.4 Alternative 5: Minimum Density Across Entire Project Site

Description

Under Alternative 5, single-family housing would be constructed throughout the project site with a minimum density of 2.1 units per acre, resulting in approximately 84 units with a similar affordable housing ratio as the proposed project. No recreational fields would be preserved or developed; instead, that area would contain homes.

Rationale for Elimination

Alternative 5 would meet the objective to redevelop the project site and to develop a project compatible with the existing biological setting and that provides improved management of preserved open space. The alternative would also provide wildland fire protection and maintenance of existing wooded areas. The alternative would also provide housing at a range of income levels that would help the City meet some of its housing goals. However, Alternative 5 would not provide as many units as the proposed project and, therefore, would not provide as much of a benefit as the proposed project, nor would it further the City's housing goals to the extent desired by the city. To compensate for the additional housing units that would not be constructed under this alternative, 71 units would have to be constructed elsewhere to produce the same total number of units. Additionally, no sports fields would be developed under this alternative. Therefore, the objective of providing recreational fields and other public facilities and amenities to provide recreational opportunities would not be attained. Eliminating recreation at the project site would conflict with goals and policies in the General Plan (City of San Bruno 2009), which is why the objective related to recreation is considered a necessary and critical project objective.

It is not clear if Alternative 5 would avoid or substantially reduce any significant impacts of the proposed project.

- **Impact BIO-1, Impact BIO-5:** Alternative 5 would have the same project site as the proposed project and would require the same kind of structure removal and vegetation removal as the proposed project, resulting in similar impacts to the proposed project.
- **Impact CUL-2, Impact GEO-5, Impact TCR-1:** Alternative 5 would have the same project site as the proposed project and require the same kind of ground disturbance as the proposed project because the entire unoccupied school facility would be demolished, resulting in similar impacts to the proposed project.
- **Impact GHG-1, Impact GHG-2, Impact TRA-2:** The VMT generated by Alternative 5 would be similar to the proposed project because the density would be reduced compared to the proposed project. Therefore, impacts from VMT, including GHG-related impacts, would be similar and potentially greater than the proposed project.
- **Impact HAZ-5:** Alternative 5 would require similar construction activities as the proposed project. As a result, similar types of hazardous materials would be used onsite, transported, and disposed of under this alternative. The potential to encounter contaminated soils would be the same as under the proposed project because the project site would be the same. Alternative 5would have the same tall lighting structures as the proposed project and would result in the same potential safety hazard related to airports. Therefore, this alternative would result in similar impacts compared to the proposed project.
- **Impact NOI-1:** Construction activities under Alternative 5 would be the same as the proposed project but would last for a shorter amount of time due to the smaller number of units, resulting in a shorter noise and vibration impact of the same noise and vibration levels as construction of the proposed project. Noise during operations could also be slightly reduced because of the decreased density and number of residents onsite but could affect more receptors due to the proximity of the homes to residents near the northern part of the project site. On balance, the impacts may be similar to the proposed project.

Therefore, this alternative is dismissed because it does not meet a critical objective of the proposed project, not meet the city's housing production goals, and because it would not avoid or substantially reduce a significant impact of the proposed project.

Chapter 5
Other CEQA Considerations

5.1 Cumulative Impacts

This section provides an analysis of cumulative impacts of the proposed project and project variant with other past, present, and probable future projects producing related impacts, as required by Section 15130 of the California Environmental Quality Act (CEQA) Guidelines. Cumulative impacts are defined in State CEQA Guidelines Section 15355 as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." A cumulative impact occurs from "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time" (State CEQA Guidelines Section 15355[b]).

5.1.1 Methods

The cumulative analysis determines first whether the overall long-term impacts of all considered projects would be cumulatively significant. If so, then the analysis determines whether the incremental contribution to the cumulatively significant impacts by the project would be "cumulatively considerable" (and thus significant). Consistent with State CEQA Guidelines Section 15130, the discussion of cumulative impacts in this environmental impact report (EIR) focuses on significant and potentially significant cumulative impacts. Section 15130(b) provides, in part, the following.

> The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

CEQA Guidelines Section 15130(b)(1) describes two approaches for characterizing cumulative impacts.

- Project list: A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, projects outside the control of the agency.
- Summary of projections: A summary of projections contained in an adopted local, regional, or statewide plan, or related planning document, that describes or evaluates conditions contributing to a cumulative effect. This summary can be supplemented with additional information, including a regional modeling program.

This EIR uses either approach, depending on which one is more appropriate for the resource area and impact. The geographic scope of the cumulative analysis also varies by resource because the

area where a cumulative effect can occur varies by resource. For example, noise impacts tend to be localized, while air quality impacts can be more widespread.

Projects considered under the project list approach include past projects, projects under construction and approved, and pending projects that are anticipated to be either under construction or operational by the time of completion of the proposed project and project variant. A list of projects and a description of those projects considered is included in Table 5.1. The list of projects was generated through review of resources such as the City of San Bruno's list of development projects, the City of Millbrae's list of development projects, the State Clearinghouse CEQAnet database for projects in the City of San Bruno, and California Department of Transportation (Caltrans) projects.

Table 5-1. Cumulative Project List

Project	Description
Office (1400–1450 Bayhill Drive, San Bruno)	**Under construction.** Development of two multi-level office buildings on properties formerly known as 901 Cherry Phase 2. Total office area in two buildings is estimated at 287,000 square feet with a multi-level subterranean parking garage for 865 parking spaces. The project also proposes to install landscape improvements and a Central Utility Plan. Project completion expected Summer 2023.
Recreation and Aquatic Center (251 City Park Way, San Bruno)	**Under construction.** The project includes demolition of the existing Veteran's Memorial Building and San Bruno Park Pool to construct a new two-story, approximately 49,360-square-foot San Bruno Recreation and Aquatic Center. Facility will include a community lounge, lobby, gymnasium, indoor pool, walking track, group exercise room, fitness room, community hall, classrooms, conference room, and City staff offices. An outdoor pool may be proposed for a future phase pending the availability of additional funding. The project also includes reconfiguration of the existing parking lot adjacent to the existing Veterans Memorial building and realignment of City Park Way to create a designated parking lot with 71 parking spaces. Realignment and naturalization of a portion of the water channel running through the park is also proposed to accommodate the parking lot reconfiguration and to improve the safety and function of the park for vehicles and pedestrians. Project completion expected fall 2023.
YouTube Office (1300 Bayhill Drive and 1350 Grundy Lane, San Bruno)	**Under construction.** YouTube, the applicant and owner of the Phase I Development area, proposes to retain the two existing office buildings on the Phase I Site and construct two new buildings with 440,000 square feet of additional office space. A maximum of three levels of subgrade parking would be provided at both parcels. Additional improvements and items include: (1) the construction of an off-street multi-modal transportation hub on an accessway located between Grundy Lane and Bayhill Drive, on the west side of the parcel containing 950 Elm Street; (2) the realignment of Grundy Lane from Cherry Avenue to Elm Avenue; (3) the abandonment of the northern portion of Elm Avenue located directly to the north of the realigned Grundy Lane; (4) the demolition of three existing buildings located at 1150–1250 Bayhill Drive to provide a construction staging and parking area during construction of the Phase I Development; and (5) a Development Agreement requested as part of the Phase I planning entitlements. Thus far, the following permits have been issued and the associated work has begun: Heritage Tree Removal Permit, Utility Cut and Cap Permit (Infrastructure work within public right-of-way), Cul-de-Sac Permit

Project	Description
	(Construction of Temporary Cul-de-Sac on Grundy Lane), and Lakes Demolition Permit (Demolition of existing buildings at 1150–1250 Bayhill Drive). Mass Excavation and Shoring work is currently underway. Additionally, the Foundation and Superstructure permit was issued in October 2022.
Engvall School Site Residential (2101 Sneath Lane, San Bruno)	**Planning application under review.** The project proposes to develop 118 single-family homes and common open spaces across the 21-acre site. Single-family homes are proposed to be clustered on the site to minimize grading and maintain a landscaped area along areas of the western edge of the site. Proposed circulation for the site would allow vehicles to enter and exit the development primarily from Sneath Lane. The Planning Division is currently processing the application. The application materials were deemed complete on November 17, 2022. A Notice of Preparation to prepare an EIR was released in August 2022 and a Planning Commission scoping meeting was held on September 20, 2022.
Mixed-Use Development (170 San Bruno Avenue, San Bruno)	**Planning application under review.** The proposed project seeks to take advantage of the State Density Bonus Law to increase residential density. Specifically, the applicant proposes to construct a new six-story, mixed-use development consisting of 42 residential units, approximately 725 square feet of ground floor commercial space, and an underground garage with 36 parking spaces. A ground floor resident community room opens to a rear yard at the ground level on top of the underground garage. The project recently completed the Transit Corridors Plan Pre-Submittal process.
Admiral Court/Commodore Drive, The Crossing (1010 Admiral Court, San Bruno)	**Planning application approved.** The project proposes the construction of two new automobile dealerships, with automobile repair and ancillary sales service uses at this vacant 1.5-acre site, formerly entitled for a hotel use. Required entitlement reviews include Architectural Review; General Plan Amendment; and U.S. Navy Site and Its Environs Specific Plan Amendment and Zoning Ordinance Amendment. The proposed building is 171,610 square feet, with two stories and rooftop parking. City Council approved the project in March 2023.
Mixed-Use Development (111 San Bruno Avenue, San Bruno)	**Planning application under review.** The proposed project seeks to take advantage of the State Density Bonus Law to increase residential density. The project proposes a five-story mixed-use building including 46 multi-family dwelling units and 2,670 square feet of ground floor commercial space with 51 parking spaces. Preliminary planning review is underway. No formal application has been submitted .
Multi-Family Residential (840 San Bruno Avenue, San Bruno)	**Planning application under review.** The proposed project seeks to take advantage of the State Density Bonus Law to increase residential density. The project includes construction of a 10-story, 341-unit 100 percent affordable multifamily housing project with 112 parking spaces. Application declared complete.
Glenview Terrace (Glenview Drive and San Bruno Avenue, San Bruno) (2880 and 2890 San Bruno Avenue West, 850 and 860 Glenview Drive, San Bruno)	**Planning application approved.** The project consists of 29 for-sale single-family dwelling units including 4 affordable units. Project was approved by the City Council in June 2022. Building permit and final map submittal is pending.

Project	Description
Multi-Family Residential (500 Sylvan Avenue, San Bruno)	**Planning application approved.** The project is a three-story multi-family residential development that includes nine rental units with an at-grade parking garage. The project includes a mix of one studio, two one-bedroom, and six two-bedroom units. The project was approved by the City Council on June 11, 2019. Demolition and building permits for the project were reviewed by all associated departments. However, the associated permits have not been issued. The project entitlements were extended to January 2023 pursuant to AB 1561. The subject site was recently sold to a new owner, who may pursue this project or an alternative project with multi-family housing.
Mills Park Center (601–799 El Camino Real, San Bruno)	**Planning application approved.** The project includes 427 dwelling units, 7,947 square feet of commercial space, 669 parking spaces, and 65 units designated for very-low, low-, and moderate-income households. City Council approved the project on June 25, 2020. An extension to the Development Agreement has been executed which extends the approvals to November 2024.
Stratford School (300 El Camino Real, San Bruno)	**Under construction.** The project consists of the renovation and conversion of the existing 8,758-square-foot. Salvation Army retail space into a private preschool operated by the Stratford School. The preschool will provide education for 144 children ages 3 and 4 years old. The front parking lot would be converted into a 3,600-square-foot playground, and the rear parking lot would be upgraded and have 15 parking spaces. The overall site is 21,625 square feet or 0.5 acre. Approved by the Architectural Review Committee in June of 2022. Building permit submitted in September 2022 with review ongoing.
Bayhill Specific Plan (San Bruno)	**Planning application approved.** The Bayhill Specific Plan is a regulatory long-range planning document that will outline a cohesive, long-term plan for the project site, which is home to the largest cluster of offices in San Bruno, including Walmart.com, The Police Credit Union, the headquarters of YouTube, and other commercial uses. The Specific Plan will facilitate integrated development within the project site, including the Phase I Development. The City anticipates that adoption of the Specific Plan will result in further intensification of land uses beyond what currently exists today. The proposed Specific Plan includes the following land uses: commercial/retail, office, residential, hotel, civic (such as a library and/or community center), and open space. Actual development intensities/densities and permitted uses will be defined through the planning and environmental review process and the new zoning district. New pedestrian and bicycle paths, as well as improvements to streetscapes are included in the Specific Plan. On September 28, 2021, the City Council granted the following approvals associated with the Bayhill Specific Plan: • Adopted Resolution No. 2021-75 approving the Water Supply Assessment Report for the proposed Bayhill Specific Plan. • Adopted Resolution No. 2021-76 certifying an EIR and adopted CEQA findings, facts, Statement of Overriding Considerations, and a Mitigation Monitoring and Reporting Program for the Bayhill Specific Plan and Google/YouTube's Phase 1 Project. • Adopted Resolution No. 2021-77 amending the San Bruno General Plan to ensure consistency with the Bayhill Specific Plan. • Adopted Resolution No. 2021-78 adopting the Bayhill Specific Plan for the Bayhill Area of the city.

Project	Description
	• Waived the first reading and introduced Ordinance No. 1903 adding Chapter 12.290, Bayhill Specific Plan Districts, to the City of San Bruno Municipal Code establishing regulations for parcels within the Bayhill Specific Plan. • Waived the first reading and introduced Ordinance No. 1904 amending the City of San Bruno Zoning Map for the Bayhill Specific Plan Area. These ordinances were formally adopted by the City Council on October 12, 2021.
Hotel (160 El Camino Real, San Bruno)	**Planning application approved.** The project consists of a three-story hotel with 28 guestrooms and basement parking on a vacant parcel. The Planning Commission approved the project in May 2021. The property is currently listed for sale.
Multi-Family Residential (271 El Camino Real, San Bruno)	**Planning application approved.** The project consists of a three-story multi-family development with 23 dwelling units and 4 affordable units. The Planning Commission approved the project in September 2021. Building permit submittal is pending.
Multi-Family Residential (820 El Camino Real, San Bruno)	**Planning application approved.** The project proposes to convert an existing, two-story duplex into a three-story triplex with one parking space. The site is 1,775 square feet. The project was approved by the Architectural Review Committee. Building permit submittal pending.
Multi-Family Residential (732–740 El Camino Real, San Bruno)	**Under construction.** The project consists of a six-story multi-family residential building with 134 dwelling units and 25 parking spaces. The applicant has requested a density bonus for the project and review of the project pursuant to Senate Bill 35. The project was administratively approved in June 2022. The applicant has submitted minor revisions to the project. A revised approval letter is expected to be issued by November 2022.
Biotechnology Lab and Office (750 El Camino Real, San Bruno)	**Under construction.** The project proposes to renovate the former Melody Toyota Dealership and Showroom as a market-ready biotechnology laboratory and office, consisting of 60 percent lab space and 40 percent office space. The parking lot on the northern portion of the site would provide 31 parking spaces. The project was approved by the Architectural Review Committee on November 10, 2022, and is now pending building permit submittal by the developer.
US 101/Produce Avenue Interchange Project (City of South San Francisco and San Mateo County)	**Under construction**. The project will build a new overcrossing above US 101, extending from the Utah Avenue/South Airport Boulevard intersection to San Mateo Avenue. Existing intersections will be reconstructed or modified at South Airport Boulevard/Utah Avenue, San Mateo Avenue/Utah Avenue, and Airport Boulevard/Produce Avenue/San Avenue. The overcrossing will have two lanes in each direction, bike lanes, and pedestrian sidewalks. Bicycle and pedestrian improvements will be included at the other intersections listed.
Skyline-Great Highway Intersection Project (Caltrans District 4)	**Under construction.** Currently there are no signals or crosswalks at the intersection of State Route 35 and Great Highway. However, Caltrans has designed a multi-modal solution for the intersection that will pedestrian, bicyclist, and motorist travel safer on this historic highway. Traffic lights will be installed for all directions along with a crosswalk to help pedestrians and cyclists. When completed, motorists, bicyclists, and pedestrians will enjoy a safer experience at the intersection. In addition, a multimodal curb ramp will be installed to provide pedestrians and bicyclists

Project	Description
	access to the Lake Merced Trail. Finally, this project will not interfere with the City of San Francisco's plans for Upper Great Highway.
959 El Camino Real Project (City of Millbrae)	**Planning application approved.** High Street No. Cal Development, Inc., on behalf of Bay Properties, Inc., seeks approval of a Design Review Permit, a Conditional Use Permit, and a Vesting Tentative Parcel Map for Condominium Purposes to demolish all existing onsite uses and construct a new, mixed-use, six-story building with 278 multi-family residential units and amenities; 17,210 square feet of ground-floor retail use; 349 vehicle parking spaces within a 105,424-square-foot, two-level parking garage (one level below grade and one at grade); and 68 enclosed bicycle parking spaces, for a total building area of 425,959 square feet.
1100 El Camino Real Project (City of Millbrae)	**Planning application review process completed.** The proposed project would demolish all existing structures and construct a new five-story apartment complex and parking garage on 5.5 acres of the site. The applicant may also include the future development of a seven-story hotel on the remaining 1.2 acres of the project site, which would occur under a separate application. The proposed apartment complex would be approximately 396,272 gross square feet (gsf) and would consist of 384 apartment units, common open space and recreational amenity areas, and an office space for property management and leasing services. The proposed apartment complex would wrap around a six-level aboveground parking garage of approximately 203,514 gsf. The future hotel is anticipated to be approximately 135,967 gsf and surround an approximately 69,533 gsf aboveground parking garage. The future hotel would include up to 200 guest rooms and onsite amenity areas such as a restaurant and meeting room that could be reserved by businesses, local community organizations, and residents for family or special events. Other site improvements included as part of the proposed project would be landscaping, utility connections, and construction of pedestrian walkways and internal access driveways. A design review permit was issued.

5.1.2 Resource Areas and Cumulative Impacts

Resource Areas Not Discussed

The proposed project would not impact several resource areas. In instances where the analysis in Chapter 3, *Impact Analysis,* determines that the proposed project and project variant would result in no impact, the associated significance criterion is not considered in the cumulative impacts analysis in this chapter because there is no potential for impacts of the proposed project and project variant to combine with the impacts of any other project. Therefore, no cumulative analysis is provided for (I) agriculture and forestry and (ii) mineral resources.

Aesthetics

Approach

Aesthetic and visual resources impacts are project-specific and highly localized; therefore, the list approach was used to evaluate potential cumulative impacts. Aesthetic impacts of projects visible from the same areas where the project would be visible were evaluated to determine whether there would be significant cumulative aesthetic and visual impacts. The geographic extent for considering cumulative impacts on aesthetics includes all projects within the same viewshed (i.e., visible from a

viewer's location) of the proposed project and project variant components, which is a conservative estimate of the likely maximum distance from which projects would be visible, particularly considering the terrain of the project area and that the project site is well-shielded from most vantage points. Projects considered are the Glenview Terrace Project and the Recreation and Aquatic Center.

Cumulative Impact Analysis

The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 miles away, respectively. The Glenview Terrace Project and the Recreation and Aquatic Center will not be noticeable in the same viewshed as the project area. Therefore, there would be no cumulative impact on scenic corridors, vistas, or highways. Additionally, construction of the Recreation and Aquatic Center would be completed prior to implementation of the proposed project and project variant and therefore would not increase aesthetic impacts of the proposed project or project variant related to scenic corridors or vistas or highways. Construction of the Glenview Terrace Project may overlap with the proposed project and project variant; however, as stated, aesthetic cumulative impact analysis is highly localized, and the Glenview Terrace Project is approximately 0.70 mile from the project site. The proposed project and project variant would be in the same location and therefore result in similar impacts, As a result, overlapping construction would not be visible, nor would either project, when completed, be visible in the same viewshed as the proposed project or project variant (Impacts AES-1 and AES-2). For the same reasons, there would also be no cumulative impact related to visual character and quality for the proposed project or project variant (Impact AES-3). The Glenview Terrace Project and the Recreation and Aquatic Center do not involve tall/stadium-style lighting; therefore, there would be no cumulative impact related to glare and nighttime lighting for the proposed project or project variant (Impact AES-4).

Air Quality

Approach

Based on the methodology for assessing air quality impacts as explained in Section 3.2, *Air Quality*, the application of the Bay Area Air Quality Management District (BAAQMD) thresholds and compliance with the BAAQMD Clean Air Plan would indicate whether the project would result in a cumulatively considerable net increase in criteria pollutants. For exposure to substantial pollutant concentrations, the BAAQMD's CEQA Guidelines indicate that combined risk levels should be determined for all toxic air contaminant (TAC) sources within 1,000 feet of a project site and compared to BAAQMD's cumulative health risk thresholds (BAAQMD 2023).

Cumulative Impact Analysis

The project would support the goals of BAAQMD's Clean Air Plan, would include all applicable control measures, and would not conflict with Clean Air Plan implementation. Because the 2017 Clean Air Plan aims to improve regional air quality in the air basin, the analysis and less-than-significant finding under Impact AQ-1 is inherently cumulative. Therefore, the project's and project variant's contribution to cumulative impacts would not be considerable (Impact AQ-1).

As discussed in Section 3.2, BAAQMD's emissions thresholds (Table 3.2-6) represent the average daily emissions that a project may generate, contributing to a cumulative impact on regional air quality. Therefore, exceedances of the BAAQMD project-level thresholds would be cumulatively considerable for project activities in the San Francisco Bay Area Air Basin (SFBAAB). As discussed under Impact AQ-2 in Section 3.2, project construction and operation would not generate regional criteria pollutant emissions in excess of applicable BAAQMD thresholds. As such, the project would not be expected to contribute a significant level of air pollution that would degrade air quality within the SFBAAB. Because the project's construction and operations emissions would not exceed regional thresholds, which are inherently cumulative, the project's criteria pollutant emissions would not be cumulatively considerable. Therefore, the project and project variant would not result in a cumulatively considerable impact (Impact AQ-2).

Existing TAC sources and the project's construction emissions could contribute to a cumulative health risk for sensitive receptors near the project site. BAAQMD's inventory of stationary sources was consulted to determine the combined level of health risks from existing stationary sources in combination with the project's contributions. However, there are no permitted stationary sources within 1,000 feet of the project site or the maximally exposed individual receptors. Geographic information system (GIS) raster files provided by BAAQMD were used to estimate emissions from roadways in the project area, including Interstate 280 and State Route 35 (BAAQMD 2022). There are no rail sources of TAC emissions within 1,000 feet of the project site or the maximally exposed individual receptors. The methods used to estimate project-related TAC emissions and health risks are described in Section 3.2, under the *Methods for Analysis* subsection, with further detail in Impact AQ-2, Impact AQ-3, and Appendix B. The results of the cumulative impact assessment are summarized in Table 5.1-2. The table shows the health risk values for the project's maximally affected receptor and the health risk contributions from existing sources within 1,000 feet of the project site. The sum of project health risk values and existing background health risk values was compared to BAAQMD cumulative thresholds. Additional data on individual background contributions from existing sources are included in Appendix B.

Table 5-2. Maximum Unmitigated Cumulative Health Risk

	Maximum Affected Receptor		
Source	Cancer Risk (per million)	Noncancer Chronic Hazard Index	Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)
Existing Source			
Stationary Sources[a]	--	--	--
Roadway Sources	1.4	0.007	0.06
Rail Sources[a]	--	--	--
Existing Total	1.4	0.007	0.06
Project Source			
Project Construction	2.7	0.003	0.10
Existing plus Project			
Existing plus Project	4.1	0.01	0.17
BAAQMD Cumulative Thresholds	100	10	0.8
Exceeds Thresholds?	No	No	No

[a] There are no stationary sources or rail sources within 1,000 feet of the project site.

As shown in Table 5.1-2, health risks associated with existing stationary, roadway, and railway sources in combination with the project would not exceed BAAQMD cumulative thresholds. Construction activities associated with the project variant would be similar in location and nature to the proposed project and project variant and therefore would result in the same impact. Therefore, the cumulative effect of health risks associated with TACs emitted by the project in combination with health risks associated with existing TAC sources would not result in a significant cumulative impact (Impact AQ-3)

Odors from project construction and operation would be limited to areas adjacent to their location of use. There are no other projects close enough to the proposed project site that would combine with these odors. The proposed project and project variant would be located on the same site. As a result, there would be no cumulative odor impact under the proposed project or project variant (Impact AQ-4).

Biological Resources

Approach

The biological resources cumulative analysis uses the list approach. The project area and vicinity are developed, with habitat that is discontinuous and fragmented. The only special-status species present on site is the San Francisco dusky-footed woodrat; however, special-status bats and nesting birds may nest in or among vegetation and buildings on site. Nevertheless, the site does not contain a concentration of extensive or contiguous habitat, in particular considering the nearby Crestmoor Canyon and Junipero Serra Park, which have more natural vegetated areas. As a result, the geographic scope of the biological resources cumulative impact analysis is limited to the project site and the area immediately surrounding it.

Cumulative Impact Analysis

Construction of the proposed project and project variant could affect the San Francisco dusky-footed woodrat, bats, and nesting birds. The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 miles away, respectively. The San Francisco dusky-footed woodrat was not identified as a special-status species on the Recreation and Aquatic Center site (City of San Bruno 2020). The Glenview Terrace Project Initial Study/Mitigated Negative Declaration (IS/MND) noted that that project could result in a significant impact on the San Francisco dusky-footed woodrat. Mitigation was required to put a buffer around active nests until any young woodrat are independent enough to move from the nest (City of San Bruno 2021). The Glenview Terrace Project is also located adjacent to Crestmoor Canyon, where there is abundant habitat for dispersal of any displaced woodrat. That project totals 3.28 acres, much of which is already developed. The proposed project and project variant also has mitigation to reduce impacts on San Francisco dusky-footed woodrat (see Mitigation Measure BIO-1a). Existing open space on the western sloped portion of the project site and in the barrier between the project site and Interstate (I-) 280 would be retained that would serve as woodrat habitat. Considering the distance of the proposed project and project variant to Glenview Terrace, the efforts to reduce impacts in both projects, and that the projects are either adjacent to or would preserve open space, cumulative impacts on San Francisco dusky-footed woodrat would be less than significant. The proposed project and project variant also has the potential to affect nesting birds through noise, vegetation removal, and tree removal. The Recreation and Aquatic Center project and

Glenview Terrace Project could result in similar impacts on nesting birds (City of San Bruno 2020, 2021). However, all projects include mitigation measures that require surveys during nesting season and buffers around active nests. (see Mitigation Measure BIO-1b). As a result, cumulative impacts would be less than significant . The Recreation and Aquatic Center project would have potential impacts on Townsend big-eared bat from disturbance of buildings and vegetation (City of San Bruno 2020). The Glenview Terrace Project may similarly affect bats (City of San Bruno 2021). The proposed project and project variant also has the same potential to disturb bats in both structures and vegetation. However, the proposed project and project variant include mitigation measures that would require surveys of bats and humane eviction or an activity-free buffer in the case of a maternity colony or overwintering colony (see Mitigation Measure BIO-1c). The Recreation and Aquatic Center project contains mitigation specific to Townsend big-ear bats, as well as a more general measure that requires two-step tree removal to allow for bats to escape trees before chipping (City of San Bruno 2020). The Glenview Terrace Project also includes mitigation, such as identifying potential roost sites, a survey for bats, avoidance of maternity colonies, and two-step passive removal of a colony or roosting bat outside of the maternity and overwintering seasons (City of San Bruno 2021). Impacts on these areas would be similar under the project variant because site disturbance and ongoing maintenance would be similar to that which would occur under the proposed project. Therefore, cumulative impacts would be less than significant under the proposed project and project variant (Impact BIO-1).

Construction and operation of the proposed project and project variant would have no impact on state or federally protected wetlands, native resident or migratory fish or wildlife species or nursery sites, riparian habitat, or sensitive natural communities and therefore would not contribute to a related cumulative impact (Impact BIO-2). Construction and operation of the proposed project and project variant would also have no impact on state or federally protected wetlands through direct removal, filling, hydrological interruption, or other means and therefore would not contribute to a related cumulative impact (Impact BIO-3). Construction and operation of the proposed project and project variant would not substantially interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedance of the use of native wildlife nursery sites (Impact BIO-4).

The Glenview Terrace Project would include removal of 44 heritage trees, but would also involve replacement tree planting and would have to comply with the heritage tree removal ordinance (City of San Bruno 2021). The Recreation and Aquatic Center project would remove 52 heritage trees; as a City-sponsored project, a tree removal permit would not be required. The project also retained 117 heritage trees, one of which would be the centerpiece of the new building design. There were also tree protection measures to protect remaining heritage trees. Construction of the proposed project and variant would also remove a number of heritage trees but also involve planting replacement trees in accordance with the heritage tree removal ordinance. Because all projects would comply with the ordinance, cumulative impacts would be less than significant (Impact BIO-5).

Construction and operation of the proposed project and project variant would have no impact on an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan and would not contribute to a related cumulative impact (Impact BIO-6).

Cultural Resources

Approach

Cultural and paleontological resources impacts are highly localized because they impact resources in discrete and typically small areas. The cumulative cultural resources analysis used the list approach. The geographic scope of cumulative impacts on cultural resources includes ground-disturbing projects within 100 feet of elements of ground-disturbing elements of the proposed project and variant that could impact known or undiscovered historical resources.

Cumulative Impact Analysis

There are no cumulative projects within 100 feet of the project site. The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 mile away, respectively, far outside the potential distance in which impacts may overlap. Therefore, there would be no cumulative impact on cultural resources for the proposed project or project variant (Impacts CUL-1, CUL-2, and CUL-3).

Geology, Soils, and Paleontology

Approach

Geology and soils impacts are project-specific and highly localized; therefore, the cumulative geology and soils resources analysis uses the list approach. The geographic extent for considering cumulative impacts on geology and soils impacts is 100 feet from the footprint of the proposed project and project variant components because geologic hazards are generally dependent on localized geologic and soil conditions. For paleontological resources, because specimens are the size of animals or plants, the scope of the geographic analysis is limited to 20 feet.

Cumulative Impact Analysis

There are no cumulative projects within 20 or 100 feet of the project site. The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 mile away, respectively, far outside the potential distance in which impacts may overlap. Therefore, there would be no cumulative impact on geology, soils, and paleontology for the proposed project or project variant (Impacts GEO-1, GEO-2, GEO-3, GEO-4, and GEO-5).

Energy

Approach

The project site's energy is supplied by the San Mateo County default electricity provider Peninsula Clean Energy (PCE), although individuals can opt out of PCE and switch to the Pacific Gas and Electric Company (PG&E). It is assumed that the proposed project and project variant would be part of PCE's electricity consumption, and therefore a projections approach is used.

Cumulative Impact Analysis

Continued population growth throughout PCE and PG&E's service areas could contribute to ongoing increases in demand for electricity and natural gas. These anticipated increases would be countered, in part, as state and local requirements related to renewable energy become more stringent and energy efficiency increases. The extent to which cumulative development could result in wasteful, inefficient, or unnecessary consumption of energy resources would depend on the specific characteristics of new development, which are not fully known at this time. However, it can be assumed that new development would incorporate energy saving features during construction and operations due to increasingly stringent requirements (e.g., CalGreen and Reach Codes), similar to the proposed project and project variant, which would result in compliance with adopted state and local renewable energy or energy efficiency regulations and plans. Cumulative impacts would therefore be less than significant for both the proposed project and project variant (Impacts EN-1 and Impact EN-2).

Greenhouse Gases

Approach

The geographic scope of cumulative impacts from greenhouse gases (GHGs) is global and therefore whether there is a significant cumulative impact is determined on the global level. It is common, however, for thresholds to be used that are designed at the state or regional level, such as by BAAQMD.

Cumulative Impact Analysis

As discussed in Section 3.7, *Greenhouse Gases*, if a project is designed and built to incorporate the design elements listed in Table 3.7-3, then it would contribute its portion of what is necessary to achieve California's long-term climate goals—its "fair share"—and would not make a cumulatively considerable contribution to global climate change. As discussed for Impact GHG-1, the proposed project and project variant would not be consistent with all BAAQMD land use Threshold Option A design elements, because the project would not achieve a reduction in project-generated vehicle miles traveled (VMT) of 15 percent below the regional average. Even with implementation of a Transportation Demand Management (TDM) program through mitigation measure TRA-2, the proposed project and project variant would result in a cumulatively considerable impact with respect to GHG emissions during operations, and there are no feasible mitigation measures to reduce this impact.

Hazardous Materials

Approach

The cumulative hazards and hazardous materials analysis uses the list approach for hazardous materials and fire impacts. Hazardous material impacts are project specific and highly localized. Fires in urban/developed areas such as the residential and recreational component of the proposed project and project variant also tend to be contained to small areas. The geographic scope of hazardous material cumulative impacts would be the area within 100 feet of the proposed project and project variant disturbance areas. The limited geographic scope is due to the fact that there is a low risk for a geographically large and dispersed hazardous material spill or release as a result of

the proposed project or project variant. The greatest risks are gasoline spillage or other fuel spillage during construction. In the event of an accident, none of the hazardous substances would be expected to be released in large quantities or to travel long distances. Additionally, any disruption to evacuation would also be in the vicinity of the project area.

Cumulative Impact Analysis

There are no cumulative projects within 100 feet of the project site. The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 mile away, respectively, far outside the potential distance in which impacts may overlap. Therefore, there would be no cumulative impact related to hazardous materials for the proposed project or project variant (Impacts HAZ-1, HAZ-2, HAZ-3, HAZ-4, HAZ-5, and HAZ-6).

Refer to the discussion of wildfire, below, regarding wildfire hazards (Impact HAZ-7).

Hydrology and Water Quality

Approach

The cumulative hydrology and water quality analysis uses the list approach due to the localized and limited effects of the proposed project and project variant. The geographic scope is 100 feet due to the localized nature of the project's impacts.

Cumulative Impact Analysis

There are no cumulative projects within 100 feet of the project site. The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 mile away, respectively, far outside the potential distance in which impacts may overlap. Therefore, there would be no cumulative impact on hydrology and water quality under the proposed project or project variant (Impacts WQ-1, WQ-2, WQ-3, and WQ-4).

Land Use

Approach

Because the land use on the project site is governed by the City of San Bruno's general plan and zoning, the scope of cumulative impacts is the city. Additionally, the proposed General Plan amendment only applies to the proposed project, limiting its effects to the project site. Because land use planning for the site is subject to the San Bruno General Plan, the analysis follows the projections approach.

Cumulative Impacts Analysis

The proposed project and project variant would have no impact related to physical division of an established community or related to conflicts with applicable General Plan sections and therefore would make no contribution to any such cumulative impact (Impacts LU-1 and LU-2).

Noise

Approach

Noise and vibration impacts are highly localized; therefore, the cumulative noise and vibration analysis uses the project list approach. The geographic scope of the analysis is projects within 200 feet of the project site so as to capture potential noise and vibration sources whose impacts may combine in addition to roadways that would host project traffic and traffic from other cumulative projects.

Cumulative Impacts Analysis

There are no projects within 200 feet of the project site; thus, there would be no cumulative noise or vibration impact related to noise from stationary and mobile uses on the project site. Additionally, no major transportation projects are planned for the area, which is largely built out. The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 mile away, respectively, far outside the potential distance in which impacts may overlap. Therefore, there would be no cumulative noise or vibration impact under the proposed project or variant (Impacts NOI-1 and NOI-2). The proposed project and project variant would have no impact related to airport noise and therefore would not contribute to any related cumulative impact (Impact NOI-3).

Population and Housing

Approach

Because the project would result in a significant impact related to population and housing growth if it would lead to substantial unplanned growth, either directly or indirectly, a cumulative impact would occur if projects in San Bruno would together lead to substantial unplanned growth. Therefore, the geographic area of analysis is the city, and the analysis follows the projections approach.

Cumulative Impacts Analysis

The evaluation of inducing population growth in the San Bruno General Plan EIR found that impacts of new development under the General Plan would be less than significant, finding that General Plan policies would ensure expansion of housing and the population would respect environmental resources, accommodate transportation needs, and provide adequate public services (City of San Bruno 2008). As a result, this cumulative impact would be less than significant under the proposed project and project variant (Impact POP-1). The proposed project and project variant would not displace people or housing and therefore would not contribute to any cumulative impact related to displacement (Impact POP-2).

Public Services

Approach

Because the project would result in a significant impact related to public services if it were to cause substantial unplanned population growth, either directly or indirectly, a cumulative impact would

occur if projects in San Bruno would together lead to substantial unplanned growth and in turn place additional pressure on the City's public services. Therefore, the geographic area of analysis is the city, and the analysis follows the projections approach.

Cumulative Impacts Analysis

The San Bruno General Plan EIR found that impacts of new development under the General Plan would result in less-than-significant impacts on fire protection and facilities, and police protection and facilities (City of San Bruno 2008). Therefore, cumulative impacts would be less than significant for both the proposed project and the project variant (Impacts PS-1 and PS-2).

The San Bruno General Plan EIR found that impacts of new development under the general plan would result in less-than-significant impacts on schools and facilities as well as libraries and facilities (City of San Bruno 2008). Therefore, cumulative impacts would be less than significant for both the proposed project and project variant (Impacts PS-3 and PS-4).

Recreation

Approach

Because the recreational facilities on the project site are governed by the City of San Bruno's General Plan, the scope of cumulative impacts is the city. Because recreational facilities on the site are subject to the General Plan and their adequacy is tied to General Plan goals, the analysis follows the projections approach. Additionally, the proposed General Plan amendment only applies to the proposed project, limiting its effects to the project site, further justifying the use of the projections approach.

Cumulative Impacts Analysis

The San Bruno General Plan EIR found impacts related to increased use of recreational facilities to be less than significant (City of San Bruno 2008). Therefore, cumulative impacts would be less than significant for both the proposed project and project variant (Impact REC-1). The San Bruno General Plan EIR found that creation of open space through implementation of policies in the General Plan that seek to clarify the location and development of public plazas in the downtown and transit station areas would offset any impacts of reduced parkland, leading to a beneficial impact (City of San Bruno 2008). The proposed project and project variant have sufficient parkland to meet the General Plan ratio requirements in the City for parkland. As a result, cumulative impacts would be less than significant for both the proposed project and project variant (Impact REC-2).

Transportation

Approach

The impacts on transportation from the proposed project and project variant would be concentrated near the project site; therefore, the list approach was used for analyzing cumulative impacts. The geographic scope of the cumulative impact analysis is the road network that would be used for the proposed project and variant.

Cumulative Impacts Analysis

There are no major transportation projects planned for the area, and the nearest cumulative projects are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 mile away, respectively. Because of their distance, integrating any of the land use projects would not alter any transportation impact conclusions for the project or variant. As a result, there would be no cumulative impact related to transportation plans (Impact TRA-1), safety (Impact TRA-3), or emergency access (Impact TRA-4) for the proposed project or project variant.

VMT, in its nature is a cumulative analysis because its comparison is to per capita VMT. As explained in Impact TRA-2, the proposed project and variant VMT per resident would be 14.7 VMT per resident, which exceeds the threshold of 15 percent below the existing regional average of 14.6 VMT per resident. With implementation of the Transportation Demand Management Program under Mitigation Measure TRA-2, alternative modes would be encouraged, the use of single-occupant vehicles would be discouraged, and the impact of additional vehicles generated by the project would be lessened. However, as explained in Impact TRA-2, impacts would be significant and unavoidable. As a result, the proposed project's and project variant's contribution would be cumulatively considerable (Impact TRA-2).

Tribal Cultural Resources

Approach

Tribal cultural resources would tend to be localized because they impact resources in discrete and typically small areas, though some resources such as cultural landscapes can be larger. The cumulative tribal cultural resources analysis used the list approach because no tribal cultural resources were identified on the site. Any tribal cultural resources on site would not have been previously discovered, indicating they are likely to be localized rather than broader like a cultural landscape. The geographic scope of cumulative impacts on tribal cultural resources includes ground-disturbing projects within 100 feet of elements of ground-disturbing elements of the proposed project and variant.

Cumulative Impact Analysis

There are no cumulative projects within 100 feet of the project site. The nearest projects to the project site with the potential to create a cumulative impact relative to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center located approximately 0.70 and 0.60 mile away, respectively, far outside the potential distance in which impacts may overlap. Therefore, there would be no cumulative impact on tribal cultural resources for the proposed project or variant (Impacts TCR-1 and TCR-2).

Utilities

Approach

The projections approach is used for utilities cumulative impact analysis because provision of these services is done on a regional scale. Therefore, the geographic scope is the region relevant to the utility or service system, which this EIR treats as the City of San Bruno because utilities are addressed in its General Plan EIR.

Cumulative Impact Analysis

The San Bruno General Plan EIR found that impacts related to wastewater treatment, electricity, telecommunications, and related physical facilities would be less than significant (City of San Bruno 2008). As a result, cumulative impacts would be less than significant under the proposed project and variant (Impact UT-1, Impact UT-3).

The San Bruno General Plan EIR found that impacts related to water demand and physical facilities for water supply would be less than significant (City of San Bruno 2008). As a result, cumulative impacts would be less than significant under the proposed project and variant (Impact UT-2).

The San Bruno General Plan EIR found that impacts related to solid waste and related physical facilities would be less than significant (City of San Bruno 2008). As a result, cumulative impacts would be less than significant under the proposed project and variant (Impacts UT-4 and UT-5).

Wildfire

Approach

The project list approach is used for wildfire cumulative impact analysis because the project is not in an area of elevated fire risk and is not contiguous with extensive open space areas. The potential for wildfire risk to accumulate with other projects is therefore limited.

Cumulative Impact Analysis

The closest cumulative projects to the proposed project and project variant are the Glenview Terrace Project and the Recreation and Aquatic Center. The Glenview Terrace Project is located on the other side of residential development and San Bruno Avenue such that wildfire risk would not combine. Similarly, the Recreation and Aquatic Center is on the other side of Interstate 280 from the proposed project and project variant, limiting the potential for any cumulative impacts. Additionally, all projects would comply with applicable building codes requirements around fire prevention and response. Cumulative wildfire impacts would be less than significant for the proposed project and project variant (Impacts WF-1, WF-2, WF-3, and WF-4).

5.2 Growth-Inducing Impacts

Section 15126.2(e) of the State CEQA Guidelines provides the following guidance for assessing growth-inducing impacts of a project.

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a wastewater treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also, discuss the characteristics of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can induce growth directly, indirectly, or both. Direct growth inducement would result if a project involved construction of new housing. Indirect growth inducement would result, for instance, if implementing a project resulted in any of the following.

- Substantial new permanent employment opportunities (e.g., commercial, industrial, or governmental enterprises).
- Substantial short-term employment opportunities (e.g., construction employment) that indirectly stimulates the need for additional housing and services to support the new temporary employment demand.
- Removal of an obstacle to additional growth and development, such as removing a constraint on a required public utility or service (e.g., construction of a major sewer line with excess capacity through an undeveloped area).

Growth inducement itself is not an environmental effect but may foreseeably lead to environmental effects. If substantial growth inducement occurs, it can result in secondary environmental effects, such as increased demand for housing, demand for other community and public services and infrastructure capacity, increased traffic and noise, degradation of air or water quality, degradation or loss of plant or animal habitats, conversion of agricultural and open-space land to urban uses, and other effects.

5.2.1 Growth-Inducing Effects of Construction

Both proposed project and project variant construction would require onsite personnel for grading, home construction, vegetation management, and recreation field construction. Construction jobs supporting the project would be temporary and short term, depending on the type of work done, and it is the nature of construction work that contractors bid and work on projects based on their availability and need for work, and in regions that are accessible to their work force. Additionally, though construction of project may last about 21 months, all personnel would not be on the site at once, as construction needs would change depending on the phase and type of construction being completed, meaning that certain workers would not be on site for the entirety of construction. As existing construction projects near completion, contractors may seek out new construction projects to maintain employment for the same workers. Given the short duration of onsite construction activities and that construction involves common construction activities (e.g., grading, home construction, road paving), it is not reasonable to anticipate that construction workers would move to the city or the region as a result of the proposed project and project variant. The *San Mateo County Economic Forecast* for 2022 indicates that the construction sector was expected to rebound in 2022 from the pandemic. It concludes that "housing production and nonresidential development expected over the next several years will not require the expansion of an already historically large construction workforce" (Caltrans 2023). For these reasons, it is evident that the existing labor force residing locally (within the city or county) would be sufficient to meet construction employment needs for the project. Therefore, the project would not induce population growth by bringing substantial numbers of construction jobs to the area or result in associated increases in demand for housing or goods and services.

5.2.2 Growth-Inducing Effects of Operation

Direct Growth

The proposed project and project variant and variant would result in 155 new single-family homes (388 residents). However, this is within the proposed density allowed by the residential designation on the site. The direct impacts of the project's 155 residential units are presented in Chapter 3 and earlier in this chapter related to the project's contributions to cumulative impacts. Although a General Plan Amendment is required for the proposed project and project variant, that amendment is to address the recreational component of the project. The recreational field would not result in any direct growth.

Indirect Growth

The recreation facility would not induce indirect growth because it is upgrading an existing recreation facility and would therefore serve existing recreation (e.g., soccer leagues and little leagues). The facilities would be maintained by existing City staff and would not result in new local job creation. As a result, the new and improved recreation facilities would not result in indirect population growth.

The proposed project and project variant, through their direct population growth (i.e., residential component), would increase economic activity in and around San Bruno because new residents would patronize local businesses. Increased economic activity could stimulate growth of services and goods sales and could result in more commercial development. Given the limited number of new residences and that individual choice for shopping and other economic activity is unpredictable for smaller projects (compared to, for example, a housing project with 1,000 units), this growth is likely to be dispersed throughout the city and beyond because the city is mostly built out such that it would not be focused in any one area. The actual site-specific environmental impacts of this additional growth would depend on the actual additional areas of growth, which cannot be known without speculation about these individual choices and behaviors. Additionally, this level of population growth is accounted for in the current San Bruno General Plan, and the proposed project and variant would indirectly foster associated nonresidential growth. The City is responsible for effectively implementing its current General Plan policies and other measures intended to mitigate the potential adverse impacts of future growth, including through CEQA review of plans and projects. Therefore, any indirect growth would be less than significant.

5.3 Significant and Unavoidable Impacts

State CEQA Guidelines Section 15126.2(b) requires EIRs to include a discussion of the significant environmental effects that cannot be avoided if the proposed project is implemented. The following impacts are considered significant and unavoidable; that is, no feasible mitigation is available to reduce the project's impacts to a less-than-significant level.

- **Impact GHG-1 (project and cumulative):** Generation of greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- **Impact GHG-2 (project and cumulative):** Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

- **Impact NOI-1 (project):** Generation of increased ambient noise levels in the project vicinity in excess of applicable standards.
- **Impact TRA-2 (project and cumulative):** Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b).

5.4 Significant Irreversible Environmental Changes

The State CEQA Guidelines require discussion of any significant irreversible environmental changes that would be caused by the project. Specifically, State CEQA Guidelines Section 15126.2(d) states the following.

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

The project would result in the irreversible and irretrievable commitment of energy and material resources during construction and operation, including the following.

- Construction materials, including such resources as soil, rocks, wood, concrete, and steel.
- Land area committed to new project facilities.
- Energy expended in the form of electricity, gasoline, diesel fuel, and oil for equipment and transportation vehicles that would be needed for project construction and operation.

The use of these nonrenewable resources is expected to account for a minimal portion of the region's resources and would not affect the availability of these resources for other needs within the region. As discussed in Section 3.5, *Energy*, the project would not result in the wasteful, inefficient, or unnecessary consumption of energy. Additionally, the project would adhere to the California Energy Code and the California Green Building Standards Code (Part 11, Title 24) (CALGreen) and incorporate water conservation and energy efficient design elements. Therefore, the use of energy on site would occur in an efficient manner.

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Chapter 7
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Appendix A

NOP Scoping

NOTICE OF PREPARATION
DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE
CRESTMOOR, 300 PIEDMONT AVENUE PROJECT

Date: **April 10, 2023**

Comment Period: **April 10 – May 11, 2023**

In accordance with the California Environmental Quality Act (CEQA) and CEQA Guidelines Section 15082, the purpose of this Notice of Preparation (NOP) is to inform interested parties that the City of San Bruno acting as the Lead Agency is preparing a Draft Environmental Impact Report (EIR) for the 300 Piedmont Avenue Project (project). SummerHill Homes proposes to redevelop the approximately 40.2-acre former Crestmoor High School site located at 300 Piedmont Avenue (the "project site") in the City of San Bruno (the "City") with a new 155-lot single family detached home community with associated open space and infrastructure. The City is requesting comments on the scope and content of the EIR. For each responsible and trustee agency, we need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval of the project. The project description, location, and potential environmental effects are contained in this NOP.

Scoping Meeting: The Planning Commission will hold a Scoping Meeting on April 18, 2023, at 6:00 p.m. to receive written and oral comments on the scope of the EIR. The meeting will be held at the San Bruno Senior Center, 1555 Crystal Springs Road, San Bruno, CA 940066. The meeting can also be attended remotely via zoom. Zoom information will be posted on the meeting agenda which will be available after 5pm on April 14, 2023, at: https://www.sanbruno.ca.gov/AgendaCenter.

Comments: This NOP is being circulated for a 30-day comment period beginning on April 10 and ending 5:00 p.m. on May 11, 2023. For responsible and trustee agencies, due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. Please send comments, along with the contact person in your agency, to:

City of San Bruno
Community and Economic Development Department
Attn: Michael Smith
567 El Camino Real
San Bruno, CA 94066
Email: msmith@sanbruno.ca.gov

Project Location and Description: The project site is located on one parcel (assessor's parcel number 019-170-020). The project involves redeveloping the approximately 40.2-acre former Crestmoor High School site located at 300 Piedmont Avenue in San Bruno (see Figure 1). Existing single-family subdivisions neighbor the project site to the north, west, and south, with a wooded hillside buffer that would remain in place to the west.

The project would involve demolition of the existing structures on the site and establishment of a new 155-lot single family detached home community with associated open space and infrastructure. One neighborhood would include 4-bedroom homes ranging in size from approximately 1,900 to 2,300 SF of living space with typical lot sizes of 3,000 SF. The second neighborhood would include 4-bedroom homes ranging in size from approximately 2,200 SF to 2,700 SF of living space with typical lot sizes of 2,850 and 3,375 SF.

The project would provide a total of approximately 18.72 acres of publicly accessible open space. Of this acreage, the City would own and maintain approximately 6.4 acres. The project would set aside approximately 12.32 acres of privately owned publicly accessible open space that would be owned and maintained by the Homeowners Association (HOA). A ring road would provide circulation around the perimeter of the project site, with east/west drives throughout. Additionally, the City proposes to develop a portion of the City-owned acreage into recreational facilities, including a multi-use soccer field with permanent lighting. Stormwater treatment facilities for the residential portion of the project would be primarily constructed in an easement within the City-owned acreage. Other smaller facilities would be located elsewhere within the site.

The EIR will also evaluate a variant to the proposed project. In the variant, the residential component of the project would be unchanged and the City would still develop a portion of the City-owned acreage into recreational facilities, including a multi-use soccer field with permanent lighting. The differences between the project and the variant would be that, in the variant: the City would own and maintain all of the project property east of Courtland Drive, except for common area parcels that provide church access, plus 4.64 acres of wooded slopes, totaling approximately 12 acres of public open space (with no additional privately owned publicly accessible open space); and the primary stormwater treatment basin for the residential project would be located within a triangular shaped .75-acre parcel on private property that would be owned and maintained by the HOA, as opposed to location within an easement on City-owned property. Additional project information is available at https://www.sanbruno.ca.gov/844/Crestmoor-300-Piedmont-Avenue.

Probable Environmental Impacts of the Project: It is preliminarily anticipated that the EIR will address the following probable environmental impacts of the project:

Aesthetics: The EIR will focus on potential conflicts with zoning and other applicable regulations governing scenic quality, potential environmental effects to scenic vistas and scenic resources, including along Interstate 280, a state designated scenic highway, as well as nighttime lighting from the residential development and lighting use in the recreational area.

Air Quality: The EIR will address the regional air quality conditions in the Bay Area and discuss the project's consistency with the applicable air quality plan and impacts to local and regional air quality and other emissions such as odors. The EIR analysis will consider sensitive receptors (e.g., nearby residential neighborhoods) and the potential health impacts of project-generated air pollutants.

Biological Resources: The EIR will identify candidate, sensitive, and special-status species, riparian habitats and other sensitive natural communities, and other sensitive resources and the potential for impacts to those resources during construction and buildout. The EIR also will discuss conflicts with any local policies or ordinances protecting biological resources.

Cultural and Tribal Cultural Resources: The EIR will analyze historic, archeological, and tribal cultural resources impacts and the potential to encounter human remains, although the site has been extensively graded and modified. The EIR will consider the potential impacts to built resources on and near the site. Consultation pursuant to Assembly Bill 52 and Senate Bill 18 will be summarized.

Energy: The EIR will evaluate the potential for the project to result in in wasteful, inefficient, or unnecessary consumption of energy resources during construction and operation. The EIR will address any conflicts with state or locals plans for renewable energy or energy efficiency.

Geology and Soils: The EIR will examine potential geologic hazards, such as fault rupture, strong seismic ground shaking, seismic-related ground failure, landslide, slope stability(such as lateral spreading, subsidence, liquefaction, collapse), and expansive soil. The EIR also will address impacts to paleontological resources.

Greenhouse Gases (GHG): The EIR will evaluate construction- and operation-related GHG emissions associated with the project as well as the project's consistency with applicable GHG-related plans and policies.

Hazards and Hazardous Materials: The EIR will include discussion of potential risks the project poses to the public, if any, including any potential emission of hazardous substances, transportation of hazardous materials required during both construction and buildout of the project, and risk of upset and accident conditions involving the release of hazardous materials. The EIR also will discuss the consistency with applicable Airport Land Use Plans.

Hydrology and Water Quality: The EIR will discuss the project's consistency with water quality standards and waste discharge requirements and analyze whether any impacts to surface water or groundwater quality would occur as result of the project. The EIR will discuss any impacts to groundwater supplies and recharge; impacts to existing drainage patterns that could result in erosion, flooding, exceeding capacity of existing drainage systems, or impeding or redirecting flood flows.. The EIR also will discuss conflicts with any water quality control plan or sustainable groundwater management plan.

Land Use and Planning: The EIR will examine whether the project would physically divide an established community or cause significant environmental impacts due to any conflicts with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating environmental effects.

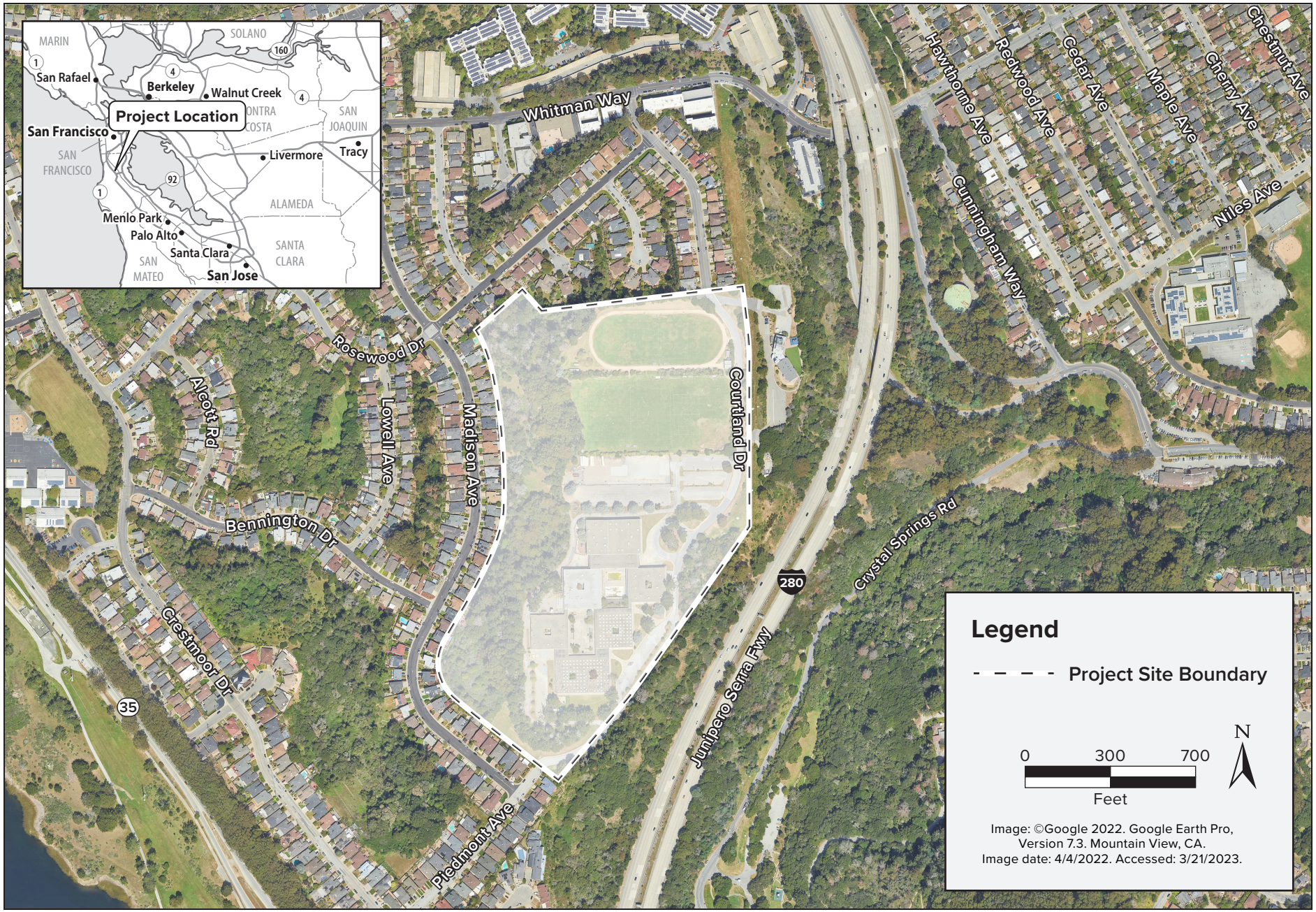
Noise and Vibration: The EIR will include noise and ground borne noise and vibration exposure analysis during activities at the sports field and from construction and buildout of the residential community. The analysis will also include traffic noise.

Population and Housing: The EIR will analyze whether the project would induce substantial unplanned population growth in the project vicinity and surrounding areas.

Public Services & Recreation: The EIR will address the availability of public services (e.g., police and fire protection, schools) and recreational facilities and the potential for the project to result in significant impacts associated with construction of new or physically altered facilities in order to maintain acceptable service ratios, response times, or other performance objectives.

Transportation: The EIR will address whether the project will conflict with a program, plan, or policy addressing the circulation system, including roadway, bicycle, transit, and pedestrian facilities in the vicinity of the project site. The EIR will evaluate impacts related to changes in vehicle miles traveled (VMT). The EIR also will evaluate potential transportation safety impacts and the adequacy of emergency access.

Wildfire: The EIR will analyze whether the project would result in exacerbated wildfire risk.



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Figure 1
Project Location
Crestmoor/300 Piedmont Avenue Project

NATIVE AMERICAN HERITAGE COMMISSION

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April 11, 2023

Michael Smith
City of San Bruno
567 El Camino Real
San Bruno, CA 94066

Re: 2023040239, Crestmoor, 300 Piedmont Avenue Project, San Mateo County

Dear Mr. Smith:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.

b. The lead agency contact information.

c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).

d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.

b. Recommended mitigation measures.

c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.

b. Significance of the tribal cultural resources.

c. Significance of the project's impacts on tribal cultural resources.

d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.

b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (https://ohp.parks.ca.gov/?page_id=30331) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Cody.Campagne@nahc.ca.gov.

Sincerely,

Cody Campagne

Cody Campagne
Cultural Resources Analyst

cc: State Clearinghouse

OneShoreline
Building Solutions for a Changing Climate

May 11, 2023

City of San Bruno
Community and Economic Development Department
Attn: Michael Smith
567 El Camino Real
San Bruno, CA 94066

Subject: Comments on Notice of Preparation of Draft Environmental Impact Report for the Crestmoor, 300 Piedmont Avenue Project

To whom it may concern:

The San Mateo County Flood and Sea Level Rise Resiliency District (OneShoreline) and the County of San Mateo Department of Public Works, in its capacity as a consultant for OneShoreline, has reviewed the Notice of Preparation (NOP) for the Crestmoor, 300 Piedmont Avenue Project and offer the following comments.

Comments

1. The NOP states that the project will provide publicly accessible open space. OneShoreline encourages that the project maximize the stormwater detention potential of this open space – including both the area proposed to be owned/maintained by private developer and the area proposed to be owned/maintained by the City – as upstream stormwater detention could help provide relief to the downstream, frequently-flooded communities in San Bruno. This could include installing a stormwater storage reservoir under the multi-use fields – similar to the Orange Memorial Park Stormwater Capture and Sports Field Improvement Projects.[1]
2. Because the proposed project site is located within the San Bruno Flood Zone, OneShoreline requires that the post-development stormwater runoff peak flow rate and volume must be less than or equal to the undeveloped stormwater runoff peak flow rate and volume at each point of discharge from the project parcel, unless an alternative discharge point is otherwise approved by City staff. Peak flow rate and volume calculations showing existing and future discharge rates must be submitted for review and approval.
    a. If undeveloped conditions of the project site are unknown, a runoff coefficient of C=0.3 shall be used for undeveloped peak flow rate calculations, per the County of San Mateo Draft Drainage Manual.[2]
    b. New and/or substantial private construction shall use the future 10-year design storm for all runoff peak flow rate and volume calculations, using the “Median (RCP 8.5)”

[1] City of South San Francisco. Orange Memorial Park Improvements. https://www.ssf.net/government/construction/orange-memorial-park-improvement
[2] County of San Mateo Drainage Manual. DRAFT December 2019, page 50. https://www.smcgov.org/planning/drainage-manual

scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.[3]

c. New and/or substantial private construction shall use at least a 6-hour storm duration for all runoff peak flow rate and volume calculations. If the time of concentration for the tributary drainage area for which the calculations are being performed is greater than 6 hours, then the storm duration shall be at least equal to the time of concentration.

d. New and/or substantial private construction shall use rainfall intensity data derived from the rainfall depth data, using the "Median (RCP 8.5)" scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.

3. If it is determined that the post-development runoff peak flow rate and/or volume exceeds the undeveloped runoff peak flow rate and/or volume for any point of discharge, an on-site Stormwater Management Feature must be designed and incorporated into proposed new and/or substantial private construction to reduce runoff peak flow rate and volume to undeveloped conditions.

a. Stormwater Management Features shall evaluate the use or restoration of natural features and ecosystem processes – such as vegetated swales, permeable pavement materials, and preservation of existing trees and vegetation – and incorporate these features to the greatest extent practicable to conserve ecosystem values and functions and provide a wide array of benefits to people and wildlife.

b. If new and/or substantial private construction proposes to use storage of stormwater as a Stormwater Management Feature, the calculated minimum amount of storage needed to meet the requirements shall be multiplied by a minimum factor of safety of 1.2 to determine the required minimum storage volume.

c. If new and/or substantial private construction proposes to use storage of stormwater as a Stormwater Management Feature, drainage facilities must have capacity for a second future 10-year design storm within 24 hours, using the "Median (RCP 8.5)" scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan. In addition, drainage facilities must completely drain within 5 days.

4. Because the proposed project site is located within the San Bruno Flood Zone, OneShoreline requires that changes in hydrology due to climate change, including changes in extreme precipitation events like atmospheric rivers, be incorporated into the design of any new stormwater conveyance infrastructure proposed in new and/or substantial private construction.

a. Minor drainage facilities/pipes, as defined by City staff, shall be sized for at least a future 10-year design storm, using the "Median (RCP 8.5)" scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.

b. Secondary drainage channels and conduits, as defined by City staff, shall be sized for at least a future 25-year design storm, using the "Median (RCP 8.5)" scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.

[3] Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan. C/CAG. https://ccag.ca.gov/wp-content/uploads/2021/02/Appendix-A-SSMP-Climate-Change-Report-FINAL.pdf. Table 1-5 on PDF page 14.

c. Major drainage channels and conduits, as defined by City staff, shall be sized for the future 100-year design storm, using the “Median (RCP 8.5)” scenario from the Climate Adaptation Risk Analysis for the San Mateo Countywide Sustainable Streets Master Plan.

5. Because the proposed project site is located within the San Bruno Flood Zone, OneShoreline requires that new and/or substantial private construction that displace floodwaters require certification from a licensed professional engineer retained by the applicant that compensatory storage is provided and that no reduction in floodway conveyance through the property or effect to adjacent properties will result. Compensatory storage can be provided either on-site or at a hydraulically connected offsite location. A floodplain hydraulic study prepared by a licensed professional engineer retained by the applicant may be required to verify compliance. In lieu of an engineering study, the applicant may be able to provide adequate information that demonstrates an understanding of floodplain conveyance and compliance with this provision.
6. OneShoreline anticipates that the City of San Bruno will ensure the proposed project will not exacerbate any pre-existing issues in the City’s storm drain system.
7. OneShoreline encourages that trash management measures be incorporated into future projects’ design elements of the storm drainage system and appurtenances to keep trash out of local creeks, streams and OneShoreline’s flood channels. Please ensure that the trash collecting devices are installed at storm drain inlets and maintained by the property owner(s).
8. OneShoreline anticipates that the City will be reviewing any bio-retention facilities proposed by future projects for compliance with requirements of Provision C.3.d of the NPDES Municipal Regional Stormwater Permit (Order No. R2-2022-0018) from the San Francisco Bay Regional Water Quality Control Board.

Thank you for the opportunity to comment on this document. Please let me know if you have any questions about our comments.

Sincerely,

Makena Wong
Project Manager

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San Francisco International Airport

May 4, 2023

Michael Smith
City of San Bruno
Community and Economic Development Department
567 El Camino Real
San Bruno, California 94066

TRANSMITTAL VIA EMAIL ONLY
msmith@sanbruno.ca.gov

Subject: ***NOP Comments: Draft Environmental Impact Report for the 300 Piedmont Avenue Project, San Bruno, California***

San Francisco International Airport (SFO or the Airport) staff have reviewed the Notice of Preparation (NOP) of the Draft Environmental Impact Report (DEIR) for the 300 Piedmont Avenue Project (the Proposed Project), located in the City of San Bruno (the City). We appreciate this opportunity to provide comments on the NOP of the DEIR.

As described in the NOP, the Proposed Project is located at 300 Piedmont Avenue (Assessor's Parcel Number 019-170-020) on an approximately 40-acre site. Existing single-family subdivisions are to the north, west, and south, and a wooded hillside and Interstate 280 are to the east. The site is developed with buildings and facilities associated with the former Crestmoor High School, which closed in 1980.

The Proposed Project consists of demolishing the existing structures and establishing a new 155-lot single-family detached home community with associated open space and infrastructure. One neighborhood would include four-bedroom homes with typical lot sizes of approximately 3,000 square feet, and the second neighborhood would include four-bedroom homes with typical lot sizes of approximately 2,875 and 3,375 square feet. The Proposed Project would include approximately 18.72 acres of publicly accessible open space. Of this acreage, approximately 6.4 acres would be owned and maintained by the City, and approximately 12.32 acres would be owned and maintained by the Homeowners Association (HOA). A portion of the City-owned open space would be developed as a multi-use soccer field with permanent lighting.

The NOP states that the DEIR will also evaluate a variant to the Proposed Project. The variant would differ as follows: (1) the City would own the land east of Courtland Drive plus approximately 4.64 acres of wooded slope; and (2) the primary stormwater treatment basin for the residential component would be on a 0.75-acre parcel on private property that would be owned and maintained by the HOA instead of being located within an easement on City-owned property. All other components would remain the same as under the Proposed Project.

The Proposed Project site is inside Airport Influence Area B as defined by the *Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport* (SFO ALUCP). The Proposed Project site would be located outside of the 65 decibel Community Noise Equivalent Level (dBA CNEL) contour and all safety compatibility zones, and therefore would not appear to be inconsistent with the Noise and Safety Compatibility policies adopted in the SFO ALUCP.

As described in Exhibit IV-17 of the SFO ALUCP (see attachment), the critical aeronautical surfaces at the Proposed Project location are at an elevation of approximately 880 feet above mean sea level (AMSL)

AIRPORT COMMISSION CITY AND COUNTY OF SAN FRANCISCO

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as defined from the origin of the North American Vertical Datum of 1988 (NAVD88). The maximum height of the single-family residences, listed as 28 feet or two stories above ground level, would be below the critical aeronautical surfaces and the Proposed Project would not appear to be inconsistent with the Airspace Compatibility Policies of the SFO ALUCP, subject to the issuance of a Determination of No Hazard from the Federal Aviation Administration (see below) for any proposed structures, and determinations from the City/County Association of Governments of San Mateo County as the designated Airport Land Use Commission.

This evaluation does not waive the requirement for the Proposed Project sponsor to undergo Federal Aviation Administration airspace review as described in 14 Code of Federal Regulations Part 77 for both (1) the permanent structures and (2) any equipment taller than the permanent structures required to construct those structures.

The NOP mentions that the proposed multi-use soccer field would include permanent lighting, but there are no further details provided in the NOP or the plans dated February 3, 2023. The Proposed Project site is subject to overflights by heavy wide-body jets departing for destinations across the Pacific Ocean. Bright lights can be a visual hazard to pilots. Lighting for the proposed multi-use soccer field should be downward-facing to minimize visual hazards to pilots that would be incompatible with the SFO ALUCP (see Airspace Protection Policy AP-4 of the attachment).

* * *

The Airport appreciates that the City intends to add new housing stock within its limits and outside of the 70 dBA CNEL noise contour. The General Plan designation for the site is Low Density Residential, which allows a maximum density of 8 units per acre. Given the size of the parcel (approximately 40 acres), the Airport notes that it would be possible to develop much denser housing at this site (up to 320 units), providing more new units. In turn, this would reduce the City's Regional Housing Needs Assessment obligations at other sites and would alleviate development pressures at incompatible sites like the Tanforan Mall, where there would be significant environmental impacts under the California Environmental Quality Act and environmental justice issues if the City proceeds with adding housing. The Airport encourages the City to consider this and other compatible parcels for maximum density before exploring the introduction of housing into incompatible sites.

The Airport appreciates your consideration of these comments. If I can be of assistance, please do not hesitate to contact me at (650) 821-6678 or at nupur.sinha@flysfo.com.

Sincerely,

DocuSigned by:
Nupur Sinha
7D552AE6A4CE495...

Nupur Sinha
Director of Planning and Environmental Affairs
San Francisco International Airport

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Attachment

cc: Audrey Park, SFO
Cathy Widener, SFO
Jovan Grogan, City of San Bruno
Darcy Smith, City of San Bruno
Matt Maloney, ABAG
Mark Shorett, ABAG

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and associated with human disease of varying severity.

b. Biosafety Level 3 practices, safety equipment, and facility design and construction are applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents with a potential for respiratory transmission, and which may cause serious and potentially lethal infection.

c. Biosafety Level 4 practices, safety equipment, and facility design and construction are applicable for work with dangerous and exotic agents that pose a high individual risk of life-threatening disease, which may be transmitted via the aerosol route and for which there is no available vaccine or therapy.

4.5 Airspace Protection

The compatibility of proposed land uses with respect to airspace protection shall be evaluated in accordance with the policies set forth in this section. These policies are established with a twofold purpose:

1. To protect the public health, safety, and welfare by minimizing the public's exposure to potential safety hazards that could be created through the construction of tall structures.

2. To protect the public interest in providing for the orderly development of SFO by ensuring that new development in the Airport environs avoids compromising the airspace in the Airport vicinity. This avoids the degradation in the safety, utility, efficiency, and air service capability of the Airport that could be caused by the attendant need to raise visibility minimums, increase minimum rates of climb, or cancel, restrict, or redesign flight procedures.

4.5.1 FEDERAL REGULATIONS REGARDING TALL STRUCTURES

14 Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use and Preservation of the Navigable Airspace*, governs the FAA's review of proposed construction exceeding certain height limits, defines airspace obstruction criteria, and provides for FAA aeronautical studies of proposed construction. **Appendix F** describes the FAA airspace review process and the extent of FAA authority related to airspace protection.

4.5.2 PART 77, SUBPART B, NOTIFICATION PROCESS

Federal regulations require any person proposing to build a new structure or alter an existing structure with a height that would exceed the elevations described in CFR Part 77, Subpart B, Section 77.9, to prepare an FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, and submit the notice to the FAA. The regulations apply to buildings and other structures or portions of structures, such as mechanical equipment, flag poles, and other projections that may exceed the aforementioned elevations.

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Exhibit IV-10 depicts the approximate elevations at which the 14 CFR Part 77 notification requirements would be triggered; see **Exhibit IV-11** for a close-up view of the northern half and **Exhibit IV-12** for a close-up view of the southern half of the area. These exhibits are provided for informational purposes only. Official determinations of the areas and elevations within which the federal notification requirements apply are subject to the authority of the FAA. The FAA is empowered to require the filing of notices for proposed construction based on considerations other than height. For example, in some areas of complex airspace and high air traffic volumes, the FAA may be concerned about the potential for new construction of any height to interfere with electronic navigation aids. In these areas, the FAA will want to review all proposed construction projects.

The FAA has developed an on-line tool for project sponsors to use in determining whether they are required to file a Notice of Proposed Construction or Alteration. Sponsors of proposed projects are urged to refer to this website to determine whether they are required to file Form 7460-1 with the FAA:

https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm

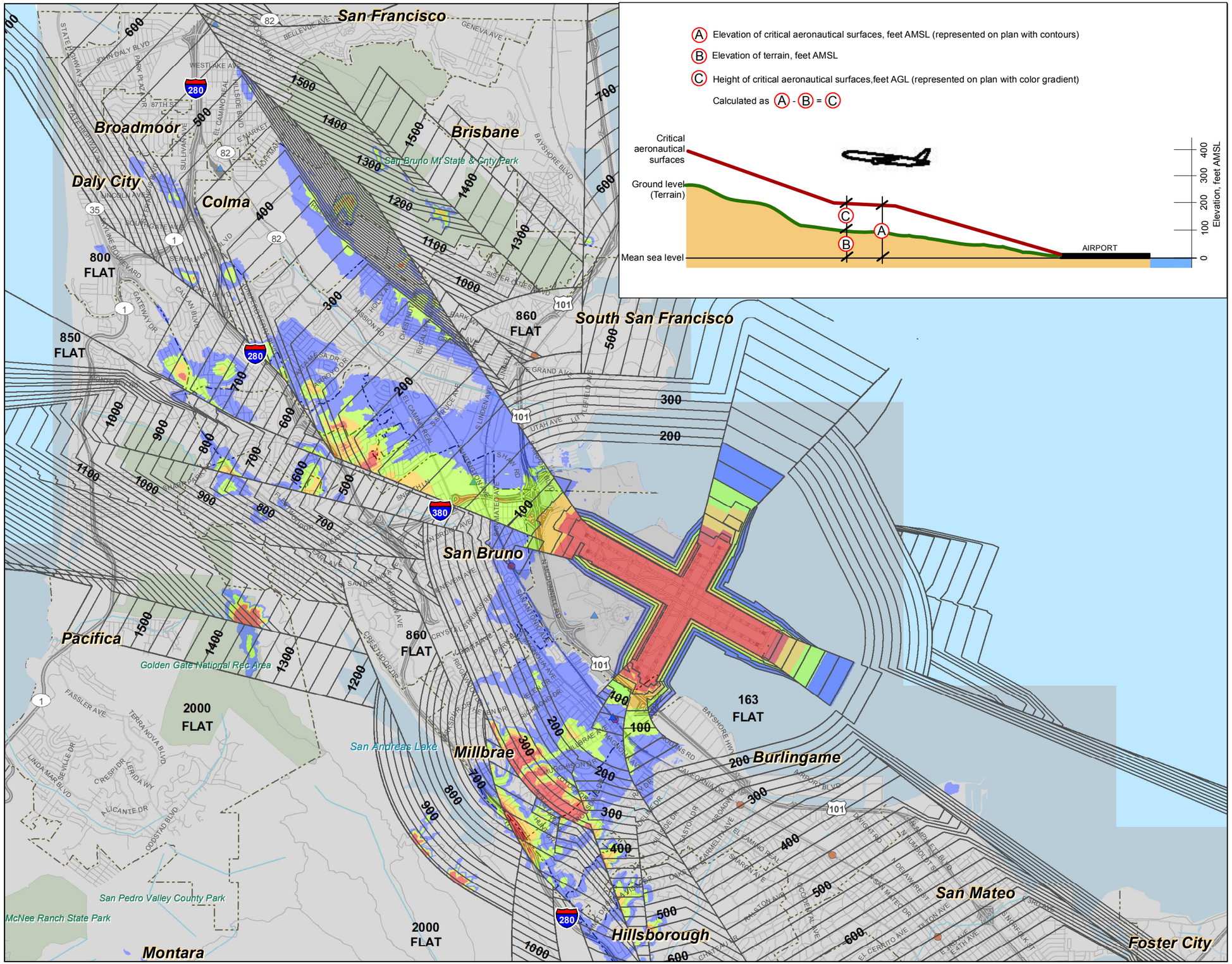
4.5.3 AIRSPACE MAPPING

Part 77, Subpart C, establishes obstruction standards for the airspace around airports including approach zones, conical zones, transitional zones, and horizontal zones known as "imaginary surfaces." **Exhibit IV-13** depicts the Part 77 Civil Airport Imaginary Surfaces at SFO. The imaginary surfaces rise from the primary surface, which is at ground level immediately around the runways. The surfaces rise gradually along the approach slopes associated with each runway end and somewhat more steeply off the sides of the runways. The FAA considers any objects penetrating these surfaces, whether buildings, trees or vehicles travelling on roads and railroads, as obstructions to air navigation. Obstructions may occur without compromising safe air navigation, but they must be marked, lighted, and noted on aeronautical publications to ensure that pilots can see and avoid them.

Close-up views of the north and south sides of the Part 77 surfaces are provided in **Exhibit IV-14** and **Exhibit IV-15**, respectively. Additionally, **Exhibit IV-16** provides an illustration of the outer approach and transitional surfaces located on the southeast side of the Part 77 surfaces.

Together with its tenant airlines, SFO has undertaken a mapping effort to illustrate the critical aeronautical surfaces that protect the airspace required for multiple types of flight procedures such as those typically factored into FAA aeronautical studies, as shown on **Exhibit IV-17** and **Exhibit IV-18**. These aeronautical surfaces include those established in accordance with FAA Order 8260.3B, *U.S. Standard for Terminal Instrument Procedures (TERPS)*, and a surface representing the airspace required for One-Engine Inoperative (OEI) departures from Runway 28L (to the west through the San Bruno Gap).[16] The exhibits depict the lowest elevations from the combination of the OEI procedure surface and all TERPS surfaces. The surfaces are defined with Required Obstacle Clearance (ROC) criteria to ensure safe separation of aircraft using the procedures from the underlying obstacles. Any proposed structures penetrating these surfaces are likely to receive Determinations of Hazard (DOH) from the FAA through the 7460-1 aeronautical study process. These surfaces indicate the maximum height at which structures can be considered compatible with Airport operations.

[16] See Appendix F, Section F.3.2 for a discussion of one-engine inoperative procedures.



LEGEND

- (A) 100 — Elevation of critical aeronautical surfaces, feet Above Mean Sea Level (AMSL), North American Vertical Datum of 1988 (NAVD88)
- (C) **Height of Critical Aeronautical Surfaces, Feet Above Ground Level (AGL)**
  - 35 and lower
  - 35- 65
  - 65 - 100
  - 100 - 150
  - 150 and more
  - Airport Property
  - BART Station
  - CALTRAIN Station
  - Regional Park or Recreation Area
  - Municipal Boundary
  - Railroad
  - Freeway
  - Road

Notes:

1. This map is intended for informational and conceptual planning purposes, generally representing the aeronautical surfaces considered most critical by San Francisco International Airport (SFO) and its constituent airlines. It does not represent actual survey data, nor should it be used as the sole source of information regarding compatibility with airspace clearance requirements in the development of data for an FAA Form 7460-1, Notice of Proposed Construction or Alteration. SFO does not certify its accuracy, information, or title to the properties contained in this plan. SFO does make any warrants of any kind, express or implied, in fact or by law, with respect to boundaries, easements, restrictions, claims, overlaps, or other encumbrances affecting such properties.

2. This map does not replace the FAA's obstruction evaluation / airport airspace analysis (OE/AAA) review process. Proposing construction at elevations and heights that are lower than the critical aeronautical surfaces shown on this map, (a) does not relieve the construction sponsor of the obligation to file an FAA Form 7460-1, and (b) does not ensure that the proposal will be acceptable to the FAA, SFO, air carriers, or other agencies or stakeholders. SFO, San Mateo County, and local authorities having jurisdiction reserve the right to re-assess, review, and seek modifications to projects that may be consistent with this critical aeronautical surfaces map but that through the FAA OE/AAA process are found to have unexpected impacts to the safety or efficiency of operations at SFO.

Sources: San Francisco International Airport, Jacobs Consultancy, and Planning Technology Inc., 2009

NORTH

0 0.25 0.5 1 Miles

Exhibit IV-17

CRITICAL AERONAUTICAL SURFACES -- NORTHWEST SIDE

Comprehensive Airport Land Use Plan for the Environs of San Francisco International Airport

C/CAG

City/County Association of Governments of San Mateo County, California

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Exhibit IV-19, which is provided for information purposes only, depicts a profile view of the lowest critical airspace surfaces along the extended centerline of Runway 10L-28R – the TERPS Obstacle Departure Procedure (ODP) surface, representing standard all-engines departures, and the approximate OEI surface developed by SFO through independent study in consultation with the airlines serving SFO. The exhibit also shows the terrain elevation beneath the airspace surfaces and various aircraft approach and departure profiles, based on varying operating assumptions. The exhibit illustrates a fundamental principle related to the design of airspace protection surfaces. The surfaces are always designed below the actual aircraft flight profile which they are designed to protect, thus providing a margin of safety. Note that the ODP climb profile is above the ODP airspace surface, and the OEI climb profile is above the OEI airspace surface.

4.5.4 AIRSPACE PROTECTION POLICIES

The following airspace protection policies (AP) shall apply to the ALUCP.

AP-1 COMPLIANCE WITH 14 CFR PART 77, SUBPART B, NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION

AP-1.1 Local Government Responsibility to Notify Project Sponsors

Local governments should notify sponsors of proposed projects at the earliest opportunity to file Form 7460-1, *Notice of Proposed Construction or Alteration*, with the FAA for any proposed project that would exceed the FAA notification heights, as shown approximately on Exhibit IV-10. Under Federal law, it is the responsibility of the project sponsor to comply with all notification and other requirements described in 14 CFR Part 77. This requirement applies independent of this ALUCP.

AP-1.2 FAA Aeronautical Study Findings Required Before Processing Development Application

The sponsor of a proposed project that would exceed the FAA notification heights, as shown approximately on Exhibit IV-10, shall present to the local government permitting agency with his or her application for a development permit, a copy of the findings of the FAA's aeronautical study, or evidence demonstrating that he or she is exempt from having to file an FAA Form 7460-1. It is the responsibility of the local agency to consider the FAA determination study findings as part of its review and decision on the proposed project.

AP-2 COMPLIANCE WITH FINDINGS OF FAA AERONAUTICAL STUDIES

Project sponsors shall be required to comply with the findings of FAA aeronautical studies with respect to any recommended alterations in the building design and height and any recommended marking and lighting of their structures for their proposed projects to be deemed consistent with this ALUCP.

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AP-3 MAXIMUM COMPATIBLE BUILDING HEIGHT

In order to be deemed consistent with the ALUCP, the maximum height of a new building must be the lower of (1) the height shown on the SFO critical aeronautical surfaces map (Exhibits IV-17 and IV-18), or (2) the maximum height determined not to be a "hazard to air navigation" by the FAA in an aeronautical study prepared pursuant to the filing of Form 7460-1.

For the vast majority of parcels, the height limits established in local zoning ordinances are lower than the critical airspace surfaces. In those cases, the zoning district height regulations will control. Compliance with the zoning district height and the SFO critical aeronautical surfaces map, however, does not relieve the construction sponsor of the obligation to file a FAA Form 7460-1 *Notice of Proposed Construction or Alteration*, if required, and to comply with the determinations resulting from the FAA's aeronautical study.

For a project to be consistent with this ALUCP, no local agency development permits shall be issued for any proposed structure that would penetrate the aeronautical surfaces shown on Exhibits IV-17 and IV-18 or the construction of which **has not** received a Determination of No Hazard from the FAA, or which would cause the FAA to increase the minimum visibility requirements for any instrument approach or departure procedure at the Airport.

AP-4 OTHER FLIGHT HAZARDS ARE INCOMPATIBLE

Proposed land uses with characteristics that may cause visual, electronic, or wildlife hazards, particularly bird strike hazards, to aircraft taking off or landing at the Airport or in flight are incompatible in Area B of the Airport Influence Area. They may be permitted only if the uses are consistent with FAA rules and regulations. Proof of consistency with FAA rules and regulations and with any performance standards cited below must be provided to the Airport Land Use Commission (C/CAG Board) by the sponsor of the proposed land use action.

Specific characteristics that may create hazards to aircraft in flight and which are incompatible include:

(a) Sources of glare, such as highly reflective buildings or building features, or bright lights, including search lights or laser displays, which would interfere with the vision of pilots making approaches to the Airport.

(b) Distracting lights that that could be mistaken by pilots on approach to the Airport for airport identification lighting, runway edge lighting, runway end identification lighting, or runway approach lighting.

(c) Sources of dust, smoke, or water vapor that may impair the vision of pilots making approaches to the Airport.

(d) Sources of electrical interference with aircraft or air traffic control communications or navigation equipment, including radar.

(e) Land uses that, as a regular byproduct of their operations, produce thermal plumes with the potential to rise high enough and at sufficient velocities to interfere with the control of aircraft in

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flight. Upward velocities of 4.3 meters (14.1 feet) per second at altitudes above 200 feet above the ground shall be considered as potentially interfering with the control of aircraft in flight.[17]

(f) Any use that creates an increased attraction for wildlife, particularly large flocks of birds, that is inconsistent with FAA rules and regulations, including, but not limited to, FAA Order 5200.5A, *Waste Disposal Sites On or Near Airports*, FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, and any successor or replacement orders or advisory circulars. Exceptions to this policy are acceptable for wetlands or other environmental mitigation projects required by ordinance, statute, court order, or Record of Decision issued by a federal agency under the National Environmental Policy Act.

4.5.5 iALP AIRSPACE TOOL

In consultation with C/CAG, SFO developed the iALP Airspace Tool, a web-based, interactive tool to evaluate the relationship of proposed buildings with the Airport's critical airspace surfaces. The iALP Airspace Tool is designed to assist planners, developers, and other interested persons with the implementation of the airspace protection policies of the SFO ALUCP. The tool helps users determine: (1) the maximum allowable building height at a given site, and/or (2) whether a building penetrates a critical airspace surface, and by how much, given the proposed building height.

A more detailed description of the iALP Airspace Tool and a tutorial explaining how to use it is presented in **Appendix J**. Use of this tool, however, does not relieve a project sponsor of the duty to comply with all federal regulations, including the obligation to file Form 7460-1, Notice of Proposed Construction or Alteration, with the FAA.

[17] This is a threshold established by the California Energy Commission in its review of power plant licensing applications. See *Blythe Solar Power Project: Supplemental Staff Assessment, Part 2*,. CEC-700-2010-004-REV1-SUP-PT2, July 2010. California Energy Commission. Docket Number 09-AFC-6, p. 25. This criterion is based on guidance established by the Australian Government Civil Aviation Authority (Advisory Circular AC 139-05(0), June 2004). The FAA's Airport Obstructions Standards Committee (AOSC) is studying this matter but has not yet issued specific guidance.

Appendix B

Air Quality and Greenhouse Gas Emissions

300 Piedmont San Bruno Construction Detailed Report

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1.1. Basic Project Information

Data Field	Value
Project Name	300 Piedmont San Bruno Construction
Construction Start Date	12/3/2024
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.60
Precipitation (days)	44.8
Location	37.6135387570185, -122.42816628966153
County	San Mateo
City	San Bruno
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1229
EDFZ	1
Electric Utility	Pacific Gas & Electric Company
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.13

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	155	Dwelling Unit	12.8	366,312	1,815,493	0.00	446	—

City Park	20.0	Acre	19.8	0.00	249,600	0.00	—	—
Parking Lot	8.00	Acre	7.57	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers
Construction	C-10-B	Water Active Demolition Sites
Construction	C-10-C	Water Unpaved Construction Roads

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Unmit.	23.9	25.7	0.76	9.19	0.70	2.54	10,197
Mit.	22.6	10.6	0.16	7.38	0.16	1.87	10,197
% Reduced	6%	59%	79%	20%	78%	27%	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Unmit.	22.7	30.8	0.83	15.3	0.77	3.60	12,482
Mit.	21.9	15.4	0.17	11.5	0.17	2.64	12,482
% Reduced	4%	50%	79%	25%	78%	27%	—
Average Daily (Max)	—	—	—	—	—	—	—
Unmit.	8.65	10.4	0.32	5.40	0.30	1.20	3,807
Mit.	8.07	5.20	0.08	3.77	0.07	0.83	3,846
% Reduced	7%	50%	77%	30%	75%	31%	-1%
Annual (Max)	—	—	—	—	—	—	—

Unmit.	1.58	1.89	0.06	0.99	0.05	0.22	630
Mit.	1.47	0.95	0.01	0.69	0.01	0.15	637
% Reduced	7%	50%	77%	30%	75%	31%	-1%

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—
2025	23.9	25.7	0.76	9.19	0.70	2.54	10,197
2026	22.6	11.5	0.41	4.90	0.38	1.17	3,492
Daily - Winter (Max)	—	—	—	—	—	—	—
2024	0.26	4.89	0.08	6.15	0.07	1.06	2,347
2025	22.7	30.8	0.83	15.3	0.77	3.60	12,482
2026	22.6	11.5	0.41	4.90	0.38	1.17	3,469
Average Daily	—	—	—	—	—	—	—
2024	0.02	0.29	< 0.005	0.37	< 0.005	0.06	142
2025	8.65	10.4	0.32	5.40	0.30	1.20	3,807
2026	6.86	3.49	0.12	1.47	0.11	0.35	1,053
Annual	—	—	—	—	—	—	—
2024	< 0.005	0.05	< 0.005	0.07	< 0.005	0.01	23.6
2025	1.58	1.89	0.06	0.99	0.05	0.22	630
2026	1.25	0.64	0.02	0.27	0.02	0.06	174

2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—

2025	22.6	10.6	0.16	7.38	0.16	1.87	10,197
2026	21.9	5.02	0.12	3.42	0.11	0.78	3,596
Daily - Winter (Max)	—	—	—	—	—	—	—
2024	0.10	4.51	0.03	4.11	0.03	0.77	2,347
2025	21.9	15.4	0.17	11.5	0.17	2.64	12,482
2026	21.9	5.07	0.12	3.42	0.11	0.78	3,574
Average Daily	—	—	—	—	—	—	—
2024	0.01	0.27	< 0.005	0.25	< 0.005	0.05	142
2025	8.07	5.20	0.08	3.77	0.07	0.83	3,846
2026	6.63	1.53	0.03	1.02	0.03	0.23	1,085
Annual	—	—	—	—	—	—	—
2024	< 0.005	0.05	< 0.005	0.04	< 0.005	0.01	23.6
2025	1.47	0.95	0.01	0.69	0.01	0.15	637
2026	1.21	0.28	0.01	0.19	0.01	0.04	180

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.20	1.66	0.06	0.06	0.05	0.05	275
Demolition	—	—	—	2.20	—	0.33	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	10.1
Average Daily	—	—	—	—	—	—	—

Off-Road Equipment	0.01	0.10	< 0.005	< 0.005	< 0.005	< 0.005	16.7
Demolition	—	—	—	0.13	—	0.02	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.13	< 0.005	0.01	0.61
Annual	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.02	< 0.005	< 0.005	< 0.005	< 0.005	2.76
Demolition	—	—	—	0.02	—	< 0.005	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.02	< 0.005	< 0.005	0.10
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.20	0.00	0.05	48.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	3.18	0.02	1.51	0.02	0.40	2,014
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	2.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.19	< 0.005	0.09	< 0.005	0.02	122
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	0.00	< 0.005	0.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.03	< 0.005	0.02	< 0.005	< 0.005	20.2

3.2. Demolition (2024) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.04	1.29	< 0.005	< 0.005	< 0.005	< 0.005	275
Demolition	—	—	—	1.41	—	0.21	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	10.1
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.08	< 0.005	< 0.005	< 0.005	< 0.005	16.7
Demolition	—	—	—	0.09	—	0.01	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.06	< 0.005	0.01	0.61
Annual	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	2.76
Demolition	—	—	—	0.02	—	< 0.005	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	0.10
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.20	0.00	0.05	48.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	3.18	0.02	1.51	0.02	0.40	2,014
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	2.95
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.19	< 0.005	0.09	< 0.005	0.02	122
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	0.00	< 0.005	0.49
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.03	< 0.005	0.02	< 0.005	< 0.005	20.2

3.3. Demolition (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.19	1.63	0.05	0.05	0.05	0.05	275
Demolition	—	—	—	2.20	—	0.33	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.29	0.01	0.01	0.01	0.01	48.3
Demolition	—	—	—	0.39	—	0.06	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.38	< 0.005	0.04	1.75
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	8.00
Demolition	—	—	—	0.07	—	0.01	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.07	< 0.005	0.01	0.29
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.20	0.00	0.05	47.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	3.02	0.02	1.51	0.02	0.40	1,968
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.03	0.00	0.01	8.37
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.52	< 0.005	0.26	< 0.005	0.07	347

Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	1.39
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.10	< 0.005	0.05	< 0.005	0.01	57.4

3.4. Demolition (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.04	1.29	< 0.005	< 0.005	< 0.005	< 0.005	275
Demolition	—	—	—	1.41	—	0.21	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.23	< 0.005	< 0.005	< 0.005	< 0.005	48.3
Demolition	—	—	—	0.25	—	0.04	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.17	< 0.005	0.02	1.75
Annual	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.04	< 0.005	< 0.005	< 0.005	< 0.005	8.00
Demolition	—	—	—	0.05	—	0.01	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.03	< 0.005	< 0.005	0.29
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.20	0.00	0.05	47.3
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.04	3.02	0.02	1.51	0.02	0.40	1,968
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.03	0.00	0.01	8.37
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.52	< 0.005	0.26	< 0.005	0.07	347
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	1.39
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.10	< 0.005	0.05	< 0.005	0.01	57.4

3.5. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.87	17.5	0.70	0.70	0.64	0.64	4,471
Dust From Material Movement	—	—	—	1.66	—	0.45	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.87	17.5	0.70	0.70	0.64	0.64	4,471
Dust From Material Movement	—	—	—	1.66	—	0.45	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.23	2.11	0.08	0.08	0.08	0.08	539
Dust From Material Movement	—	—	—	0.20	—	0.05	—

Onsite truck	< 0.005	< 0.005	< 0.005	0.26	< 0.005	0.03	1.20
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.38	0.02	0.02	0.01	0.01	89.2
Dust From Material Movement	—	—	—	0.04	—	0.01	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.05	< 0.005	< 0.005	0.20
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	82.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.13	8.22	0.06	4.32	0.06	1.15	5,634
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	78.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.12	8.63	0.06	4.32	0.06	1.16	5,622
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.04	0.00	0.01	9.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	1.02	0.01	0.51	0.01	0.14	678
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	1.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.19	< 0.005	0.09	< 0.005	0.02	112

3.6. Grading (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e

Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.42	2.34	0.08	0.08	0.08	0.08	4,471
Dust From Material Movement	—	—	—	1.66	—	0.45	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.42	2.34	0.08	0.08	0.08	0.08	4,471
Dust From Material Movement	—	—	—	1.66	—	0.45	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.28	0.01	0.01	0.01	0.01	539
Dust From Material Movement	—	—	—	0.20	—	0.05	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.12	< 0.005	0.01	1.20
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	89.2
Dust From Material Movement	—	—	—	0.04	—	0.01	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.02	< 0.005	< 0.005	0.20
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	82.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.13	8.22	0.06	4.32	0.06	1.15	5,634
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	78.8
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.12	8.63	0.06	4.32	0.06	1.16	5,622
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.04	0.00	0.01	9.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.02	1.02	0.01	0.51	0.01	0.14	678
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	1.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.19	< 0.005	0.09	< 0.005	0.02	112

3.7. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.25	11.3	0.46	0.46	0.42	0.42	2,540
Architectural Coatings	21.3	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.25	11.3	0.46	0.46	0.42	0.42	2,540
Architectural Coatings	21.3	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.45	4.08	0.17	0.17	0.15	0.15	915
Architectural Coatings	7.66	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	0.78	< 0.005	0.08	3.58
Annual	—	—	—	—	—	—	—

Off-Road Equipment	0.08	0.74	0.03	0.03	0.03	0.03	151
Architectural Coatings	1.40	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.14	< 0.005	0.01	0.59
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.13	0.10	0.00	1.90	0.00	0.47	462
Vendor	0.02	0.68	0.01	0.43	0.01	0.12	499
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.13	0.14	0.00	1.90	0.00	0.47	440
Vendor	0.02	0.71	0.01	0.43	0.01	0.12	498
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.05	0.04	0.00	0.66	0.00	0.16	159
Vendor	0.01	0.25	< 0.005	0.15	< 0.005	0.04	180
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.12	0.00	0.03	26.3
Vendor	< 0.005	0.05	< 0.005	0.03	< 0.005	0.01	29.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.8. Building Construction (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.45	4.27	0.11	0.11	0.10	0.10	2,644

Architectural Coatings	21.3	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.45	4.27	0.11	0.11	0.10	0.10	2,644
Architectural Coatings	21.3	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.54	0.04	0.04	0.04	0.04	952
Architectural Coatings	7.66	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	0.35	< 0.005	0.04	3.58
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.28	0.01	0.01	0.01	0.01	158
Architectural Coatings	1.40	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.06	< 0.005	0.01	0.59
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.13	0.10	0.00	1.90	0.00	0.47	462
Vendor	0.02	0.68	0.01	0.43	0.01	0.12	499
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.13	0.14	0.00	1.90	0.00	0.47	440
Vendor	0.02	0.71	0.01	0.43	0.01	0.12	498
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.05	0.04	0.00	0.66	0.00	0.16	159
Vendor	0.01	0.25	< 0.005	0.15	< 0.005	0.04	180
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.12	0.00	0.03	26.3
Vendor	< 0.005	0.05	< 0.005	0.03	< 0.005	0.01	29.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.19	10.7	0.40	0.40	0.37	0.37	2,539
Architectural Coatings	21.3	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.81
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	1.19	10.7	0.40	0.40	0.37	0.37	2,539
Architectural Coatings	21.3	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.80
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.36	3.25	0.12	0.12	0.11	0.11	770
Architectural Coatings	6.46	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	0.66	< 0.005	0.07	2.97
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.59	0.02	0.02	0.02	0.02	128
Architectural Coatings	1.18	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.12	< 0.005	0.01	0.49
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—

Worker	0.13	0.10	0.00	1.90	0.00	0.47	453
Vendor	0.02	0.64	0.01	0.43	0.01	0.12	490
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.13	0.12	0.00	1.90	0.00	0.47	431
Vendor	0.02	0.67	0.01	0.43	0.01	0.12	489
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.04	0.04	0.00	0.56	0.00	0.14	131
Vendor	< 0.005	0.20	< 0.005	0.13	< 0.005	0.03	148
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.10	0.00	0.03	21.7
Vendor	< 0.005	0.04	< 0.005	0.02	< 0.005	0.01	24.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.10. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.45	4.26	0.11	0.11	0.10	0.10	2,644
Architectural Coatings	21.3	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.81
Daily, Winter (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.45	4.26	0.11	0.11	0.10	0.10	2,644
Architectural Coatings	21.3	—	—	—	—	—	—

Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.80
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.14	1.29	0.03	0.03	0.03	0.03	802
Architectural Coatings	6.46	—	—	—	—	—	—
Onsite truck	< 0.005	0.01	< 0.005	0.30	< 0.005	0.03	2.97
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.24	0.01	0.01	0.01	0.01	133
Architectural Coatings	1.18	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.05	< 0.005	0.01	0.49
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.13	0.10	0.00	1.90	0.00	0.47	453
Vendor	0.02	0.64	0.01	0.43	0.01	0.12	490
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—
Worker	0.13	0.12	0.00	1.90	0.00	0.47	431
Vendor	0.02	0.67	0.01	0.43	0.01	0.12	489
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—
Worker	0.04	0.04	0.00	0.56	0.00	0.14	131
Vendor	< 0.005	0.20	< 0.005	0.13	< 0.005	0.03	148
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.10	0.00	0.03	21.7
Vendor	< 0.005	0.04	< 0.005	0.02	< 0.005	0.01	24.6
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.69	5.98	0.26	0.26	0.24	0.24	1,296
Paving	0.45	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.08	0.72	0.03	0.03	0.03	0.03	156
Paving	0.05	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.26	< 0.005	0.03	1.20
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.13	0.01	0.01	0.01	0.01	25.9
Paving	0.01	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.05	< 0.005	< 0.005	0.20
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	82.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	2.42	0.02	1.27	0.02	0.34	1,657
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.04	0.00	0.01	9.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.30	< 0.005	0.15	< 0.005	0.04	200

Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	1.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.06	< 0.005	0.03	< 0.005	0.01	33.0

3.12. Paving (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.16	2.23	0.03	0.03	0.03	0.03	1,305
Paving	0.45	—	—	—	—	—	—
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.27	< 0.005	< 0.005	< 0.005	< 0.005	157
Paving	0.05	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.12	< 0.005	0.01	1.20
Annual	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.05	< 0.005	< 0.005	< 0.005	< 0.005	26.0
Paving	0.01	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	0.02	< 0.005	< 0.005	0.20
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	82.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	2.42	0.02	1.27	0.02	0.34	1,657

Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.04	0.00	0.01	9.55
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.30	< 0.005	0.15	< 0.005	0.04	200
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	1.58
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.06	< 0.005	0.03	< 0.005	0.01	33.0

3.13. Trenching (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.16	1.65	0.06	0.06	0.06	0.06	437
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.29	0.01	0.01	0.01	0.01	76.7
Onsite truck	< 0.005	< 0.005	< 0.005	0.38	< 0.005	0.04	1.74
Annual	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.05	< 0.005	< 0.005	< 0.005	< 0.005	12.7
Onsite truck	< 0.005	< 0.005	< 0.005	0.07	< 0.005	0.01	0.29
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	82.9

Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	2.42	0.02	1.27	0.02	0.34	1,657
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.06	0.00	0.01	13.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.44	< 0.005	0.22	< 0.005	0.06	290
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	2.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.08	< 0.005	0.04	< 0.005	0.01	48.0

3.14. Trenching (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.04	0.21	0.01	0.01	0.01	0.01	437
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.04	< 0.005	< 0.005	< 0.005	< 0.005	76.7
Onsite truck	< 0.005	< 0.005	< 0.005	0.17	< 0.005	0.02	1.74
Annual	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	12.7
Onsite truck	< 0.005	< 0.005	< 0.005	0.03	< 0.005	< 0.005	0.29
Offsite	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.02	0.02	0.00	0.34	0.00	0.08	82.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	2.42	0.02	1.27	0.02	0.34	1,657
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.06	0.00	0.01	13.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.01	0.44	< 0.005	0.22	< 0.005	0.06	290
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.01	0.00	< 0.005	2.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.08	< 0.005	0.04	< 0.005	0.01	48.0

3.15. Trenching (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.55	0.02	0.02	0.02	0.02	146
Onsite truck	< 0.005	0.02	< 0.005	2.17	< 0.005	0.22	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.05	< 0.005	< 0.005	< 0.005	< 0.005	13.2
Onsite truck	< 0.005	< 0.005	< 0.005	0.20	< 0.005	0.02	0.90
Annual	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	2.18

Onsite truck	< 0.005	< 0.005	< 0.005	0.04	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.20	0.00	0.05	49.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	2.42	0.02	1.27	0.02	0.34	1,657
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.02	0.00	< 0.005	4.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.23	< 0.005	0.11	< 0.005	0.03	150
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	0.00	< 0.005	0.71
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.04	< 0.005	0.02	< 0.005	0.01	24.8

3.16. Trenching (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Onsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.07	< 0.005	< 0.005	< 0.005	< 0.005	146
Onsite truck	< 0.005	0.02	< 0.005	0.98	< 0.005	0.10	9.95
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	13.2
Onsite truck	< 0.005	< 0.005	< 0.005	0.09	< 0.005	0.01	0.90

Annual	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	2.18
Onsite truck	< 0.005	< 0.005	< 0.005	0.02	< 0.005	< 0.005	0.15
Offsite	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—
Worker	0.01	0.01	0.00	0.20	0.00	0.05	49.7
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.04	2.42	0.02	1.27	0.02	0.34	1,657
Daily, Winter (Max)	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	0.02	0.00	< 0.005	4.30
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.23	< 0.005	0.11	< 0.005	0.03	150
Annual	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.00	< 0.005	0.00	< 0.005	0.71
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	0.04	< 0.005	0.02	< 0.005	0.01	24.8

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—

Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	PM10E	PM10T	PM2.5E	PM2.5T	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	12/1/2024	3/31/2025	5.00	86.0	—
Rough Grading	Grading	1/30/2025	4/1/2025	5.00	44.0	—
Vertical Construction	Building Construction	7/1/2025	6/4/2026	5.00	243	—
Fine Grade, Rock, Pave Streets	Paving	7/3/2025	9/2/2025	5.00	44.0	—
Wet Utilities	Trenching	4/2/2025	6/30/2025	5.00	64.0	—
Dry Utilities	Trenching	5/19/2025	7/2/2025	5.00	33.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Excavators	Diesel	Average	2.00	6.00	36.0	0.38

Demolition	Tractors/Loaders/Backh	Diesel	Average	1.00	2.00	33.0	0.73
Rough Grading	Graders	Diesel	Average	1.00	2.00	148	0.41
Rough Grading	Rubber Tired Dozers	Diesel	Average	1.00	2.00	367	0.40
Rough Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Rough Grading	Skid Steer Loaders	Diesel	Average	1.00	2.00	36.0	0.38
Rough Grading	Plate Compactors	Diesel	Average	1.00	4.00	84.0	0.37
Vertical Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Vertical Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Vertical Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Vertical Construction	Tractors/Loaders/Backh oes	Diesel	Average	3.00	7.00	84.0	0.37
Vertical Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Vertical Construction	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48
Fine Grade, Rock, Pave Streets	Pavers	Diesel	Average	1.00	8.00	81.0	0.42
Fine Grade, Rock, Pave Streets	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Fine Grade, Rock, Pave Streets	Graders	Diesel	Average	1.00	4.00	89.0	0.36
Fine Grade, Rock, Pave Streets	Scrapers	Diesel	Average	1.00	2.00	423	0.48
Fine Grade, Rock, Pave Streets	Plate Compactors	Diesel	Average	1.00	2.00	8.00	0.43
Fine Grade, Rock, Pave Streets	Skid Steer Loaders	Diesel	Average	1.00	2.00	71.0	0.37
Wet Utilities	Excavators	Diesel	Average	2.00	4.00	84.0	0.37
Wet Utilities	Tractors/Loaders/Backh oes	Diesel	Average	1.00	4.00	84.0	0.37
Dry Utilities	Tractors/Loaders/Backh oes	Diesel	Average	1.00	4.00	84.0	0.37

5.2.2. Mitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Excavators	Diesel	Tier 4 Final	2.00	6.00	36.0	0.38
Demolition	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	2.00	33.0	0.73
Rough Grading	Graders	Diesel	Tier 4 Final	1.00	2.00	148	0.41
Rough Grading	Rubber Tired Dozers	Diesel	Tier 4 Final	1.00	2.00	367	0.40
Rough Grading	Scrapers	Diesel	Tier 4 Final	2.00	8.00	423	0.48
Rough Grading	Skid Steer Loaders	Diesel	Tier 4 Final	1.00	2.00	36.0	0.38
Rough Grading	Plate Compactors	Diesel	Tier 4 Final	1.00	4.00	84.0	0.37
Vertical Construction	Cranes	Diesel	Tier 4 Final	1.00	7.00	367	0.29
Vertical Construction	Forklifts	Diesel	Tier 4 Final	3.00	8.00	82.0	0.20
Vertical Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Vertical Construction	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	3.00	7.00	84.0	0.37
Vertical Construction	Welders	Diesel	Tier 4 Final	1.00	8.00	46.0	0.45
Vertical Construction	Air Compressors	Diesel	Tier 4 Final	1.00	6.00	37.0	0.48
Fine Grade, Rock, Pave Streets	Pavers	Diesel	Tier 4 Final	1.00	8.00	81.0	0.42
Fine Grade, Rock, Pave Streets	Rollers	Diesel	Tier 4 Final	2.00	8.00	36.0	0.38
Fine Grade, Rock, Pave Streets	Graders	Diesel	Tier 4 Final	1.00	4.00	89.0	0.36
Fine Grade, Rock, Pave Streets	Scrapers	Diesel	Tier 4 Final	1.00	2.00	423	0.48
Fine Grade, Rock, Pave Streets	Plate Compactors	Diesel	Average	1.00	2.00	8.00	0.43
Fine Grade, Rock, Pave Streets	Skid Steer Loaders	Diesel	Tier 4 Final	1.00	2.00	71.0	0.37
Wet Utilities	Excavators	Diesel	Tier 4 Final	2.00	4.00	84.0	0.37

Wet Utilities	Tractors/Loaders/Backh	Diesel	Tier 4 Final	1.00	4.00	84.0	0.37
Dry Utilities	Tractors/Loaders/Backhoes	Diesel	Tier 4 Final	1.00	4.00	84.0	0.37

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	6.00	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	23.8	20.0	HHDT
Demolition	Onsite truck	3.00	1.00	MHDT
Rough Grading	—	—	—	—
Rough Grading	Worker	10.0	11.7	LDA,LDT1,LDT2
Rough Grading	Vendor	—	8.40	HHDT,MHDT
Rough Grading	Hauling	68.0	20.0	HHDT
Rough Grading	Onsite truck	3.00	1.00	MHDT
Vertical Construction	—	—	—	—
Vertical Construction	Worker	55.8	11.7	LDA,LDT1,LDT2
Vertical Construction	Vendor	16.6	8.40	HHDT,MHDT
Vertical Construction	Hauling	0.00	20.0	HHDT
Vertical Construction	Onsite truck	3.00	1.00	MHDT
Fine Grade, Rock, Pave Streets	—	—	—	—
Fine Grade, Rock, Pave Streets	Worker	10.0	11.7	LDA,LDT1,LDT2
Fine Grade, Rock, Pave Streets	Vendor	—	8.40	HHDT,MHDT
Fine Grade, Rock, Pave Streets	Hauling	20.0	20.0	HHDT
Fine Grade, Rock, Pave Streets	Onsite truck	3.00	1.00	MHDT

Wet Utilities	—	—	—	—
Wet Utilities	Worker	10.0	11.7	LDA,LDT1,LDT2
Wet Utilities	Vendor	—	8.40	HHDT,MHDT
Wet Utilities	Hauling	20.0	20.0	HHDT
Wet Utilities	Onsite truck	3.00	1.00	MHDT
Dry Utilities	—	—	—	—
Dry Utilities	Worker	6.00	11.7	LDA,LDT1,LDT2
Dry Utilities	Vendor	0.00	8.40	HHDT,MHDT
Dry Utilities	Hauling	20.0	20.0	HHDT
Dry Utilities	Onsite truck	3.00	1.00	MHDT

5.3.2. Mitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	6.00	11.7	LDA,LDT1,LDT2
Demolition	Vendor	—	8.40	HHDT,MHDT
Demolition	Hauling	23.8	20.0	HHDT
Demolition	Onsite truck	3.00	1.00	MHDT
Rough Grading	—	—	—	—
Rough Grading	Worker	10.0	11.7	LDA,LDT1,LDT2
Rough Grading	Vendor	—	8.40	HHDT,MHDT
Rough Grading	Hauling	68.0	20.0	HHDT
Rough Grading	Onsite truck	3.00	1.00	MHDT
Vertical Construction	—	—	—	—
Vertical Construction	Worker	55.8	11.7	LDA,LDT1,LDT2
Vertical Construction	Vendor	16.6	8.40	HHDT,MHDT
Vertical Construction	Hauling	0.00	20.0	HHDT

Vertical Construction	Onsite truck	3.00	1.00	MHDT
Fine Grade, Rock, Pave Streets	—	—	—	—
Fine Grade, Rock, Pave Streets	Worker	10.0	11.7	LDA,LDT1,LDT2
Fine Grade, Rock, Pave Streets	Vendor	—	8.40	HHDT,MHDT
Fine Grade, Rock, Pave Streets	Hauling	20.0	20.0	HHDT
Fine Grade, Rock, Pave Streets	Onsite truck	3.00	1.00	MHDT
Wet Utilities	—	—	—	—
Wet Utilities	Worker	10.0	11.7	LDA,LDT1,LDT2
Wet Utilities	Vendor	—	8.40	HHDT,MHDT
Wet Utilities	Hauling	20.0	20.0	HHDT
Wet Utilities	Onsite truck	3.00	1.00	MHDT
Dry Utilities	—	—	—	—
Dry Utilities	Worker	6.00	11.7	LDA,LDT1,LDT2
Dry Utilities	Vendor	0.00	8.40	HHDT,MHDT
Dry Utilities	Hauling	20.0	20.0	HHDT
Dry Utilities	Onsite truck	3.00	1.00	MHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Vertical Construction	741,782	247,261	0.00	0.00	2,875

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (Cubic Yards)	Material Exported (Cubic Yards)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	177,950	—
Rough Grading	83,000	59,000	99.0	0.00	—
Fine Grade, Rock, Pave Streets	0.00	0.00	0.00	0.00	9.28

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	2	61%	61%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	1.71	0%
City Park	0.00	0%
Parking Lot	7.57	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	204	0.03	< 0.005
2025	0.00	204	0.03	< 0.005
2026	0.00	204	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	7.10	annual days of extreme heat
Extreme Precipitation	8.60	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	24.0	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	3	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A

Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	3	1	1	3
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract

Exposure Indicators	—
AQ-Ozone	10.6
AQ-PM	19.9
AQ-DPM	46.8
Drinking Water	12.5
Lead Risk Housing	57.1
Pesticides	0.00
Toxic Releases	32.2
Traffic	78.6
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	52.0
Haz Waste Facilities/Generators	76.8
Impaired Water Bodies	0.00
Solid Waste	9.67
Sensitive Population	—
Asthma	62.5
Cardio-vascular	42.0
Low Birth Weights	64.8
Socioeconomic Factor Indicators	—
Education	35.5
Housing	19.4
Linguistic	28.0
Poverty	14.0
Unemployment	40.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	83.07455409
Employed	94.98267676
Median HI	79.12228923
Education	—
Bachelor's or higher	66.39291672
High school enrollment	100
Preschool enrollment	64.72475298
Transportation	—
Auto Access	59.70742974
Active commuting	59.86141409
Social	—
2-parent households	87.02681894
Voting	85.60246375
Neighborhood	—
Alcohol availability	67.50930322
Park access	38.98370332
Retail density	35.32657513
Supermarket access	61.47824971
Tree canopy	95.41896574
Housing	—
Homeownership	64.41678429
Housing habitability	53.86885667
Low-inc homeowner severe housing cost burden	59.47645323
Low-inc renter severe housing cost burden	29.47517002
Uncrowded housing	50.73784165

Health Outcomes	—
Insured adults	76.20941871
Arthritis	0.0
Asthma ER Admissions	35.8
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	50.2
Cognitively Disabled	82.5
Physically Disabled	18.0
Heart Attack ER Admissions	63.3
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	81.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0

Children	51.6
Elderly	12.4
English Speaking	43.4
Foreign-born	57.4
Outdoor Workers	63.3
Climate Change Adaptive Capacity	—
Impervious Surface Cover	71.6
Traffic Density	64.4
Traffic Access	23.0
Other Indices	—
Hardship	24.3
Other Decision Support	—
2016 Voting	76.9

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	29.0
Healthy Places Index Score for Project Location (b)	88.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Based on project description and site plan.
Construction: Construction Phases	Based on data provided by applicant.
Construction: Off-Road Equipment	Based on data provided by project applicant.
Construction: Trips and VMT	Based on data provided by project applicant.
Construction: Architectural Coatings	Architectural coating activities included in vertical construction; default VOC contents and coating areas used.
Operations: Hearths	Project would be all electric; no natural gas fireplaces.
Operations: Energy Use	Project would be all electric.
Operations: Water and Waste Water	Water consumption updated based on water use factors from Water System Hydraulic Evaluation of Crestmoor Residential Development Technical Memorandum (August 2022).
Construction: On-Road Fugitive Dust	Road silt loading factor adjusted per BAAQMD 2022 CEQA Guidelines.

300 Piedmont San Bruno Operation Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	300 Piedmont San Bruno Operation
Operational Year	2026
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	4.60
Precipitation (days)	44.8
Location	37.6135387570185, -122.42816628966153
County	San Mateo
City	San Bruno
Air District	Bay Area AQMD
Air Basin	San Francisco Bay Area
TAZ	1229
EDFZ	1
Electric Utility	Peninsula Clean Energy
Gas Utility	Pacific Gas & Electric
App Version	2022.1.1.14

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	155	Dwelling Unit	12.8	366,312	1,815,493	0.00	446	—

City Park	20.0	Acre	19.8	0.00	249,600	0.00	—	—
Parking Lot	8.00	Acre	7.57	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Construction	C-5	Use Advanced Engine Tiers
Construction	C-10-A	Water Exposed Surfaces
Construction	C-10-B	Water Active Demolition Sites
Construction	C-10-C	Water Unpaved Construction Roads
Construction	C-11	Limit Vehicle Speeds on Unpaved Roads

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	14.2	2.73	0.05	8.66	8.71	0.05	2.19	2.24	63.9	9,298	9,361	6.75	0.32	30.6	9,656
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	13.4	3.13	0.05	8.66	8.71	0.05	2.19	2.24	63.9	8,866	8,930	6.79	0.35	3.35	9,209
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	13.6	2.97	0.05	8.60	8.65	0.05	2.18	2.23	63.9	8,832	8,896	6.77	0.34	14.6	9,181
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	2.49	0.54	0.01	1.57	1.58	0.01	0.40	0.41	10.6	1,462	1,473	1.12	0.06	2.42	1,520

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.98	2.65	0.05	8.66	8.71	0.05	2.19	2.24	—	9,274	9,274	0.35	0.31	28.0	9,403
Area	10.2	0.08	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.5	23.5	< 0.005	< 0.005	—	23.6
Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Waste	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Total	14.2	2.73	0.05	8.66	8.71	0.05	2.19	2.24	63.9	9,298	9,361	6.75	0.32	30.6	9,656
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.91	3.13	0.05	8.66	8.71	0.05	2.19	2.24	—	8,866	8,866	0.39	0.34	0.73	8,979
Area	9.45	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Waste	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Total	13.4	3.13	0.05	8.66	8.71	0.05	2.19	2.24	63.9	8,866	8,930	6.79	0.35	3.35	9,209
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.82	2.93	0.05	8.60	8.64	0.05	2.18	2.22	—	8,821	8,821	0.37	0.33	12.0	8,940
Area	9.83	0.04	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	11.6	11.6	< 0.005	< 0.005	—	11.6

Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Waste	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Total	13.6	2.97	0.05	8.60	8.65	0.05	2.18	2.23	63.9	8,832	8,896	6.77	0.34	14.6	9,181
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.70	0.53	0.01	1.57	1.58	0.01	0.40	0.41	—	1,460	1,460	0.06	0.05	1.99	1,480
Area	1.79	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.92	1.92	< 0.005	< 0.005	—	1.93
Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	0.62	0.00	0.62	0.06	< 0.005	—	2.65
Waste	—	—	—	—	—	—	—	—	9.97	0.00	9.97	1.00	0.00	—	34.9
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
Total	2.49	0.54	0.01	1.57	1.58	0.01	0.40	0.41	10.6	1,462	1,473	1.12	0.06	2.42	1,520

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.98	2.65	0.05	8.66	8.71	0.05	2.19	2.24	—	9,274	9,274	0.35	0.31	28.0	9,403
Area	10.2	0.08	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.5	23.5	< 0.005	< 0.005	—	23.6
Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Waste	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Total	14.2	2.73	0.05	8.66	8.71	0.05	2.19	2.24	63.9	9,298	9,361	6.75	0.32	30.6	9,656

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.91	3.13	0.05	8.66	8.71	0.05	2.19	2.24	—	8,866	8,866	0.39	0.34	0.73	8,979
Area	9.45	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Waste	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Total	13.4	3.13	0.05	8.66	8.71	0.05	2.19	2.24	63.9	8,866	8,930	6.79	0.35	3.35	9,209
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.82	2.93	0.05	8.60	8.64	0.05	2.18	2.22	—	8,821	8,821	0.37	0.33	12.0	8,940
Area	9.83	0.04	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	11.6	11.6	< 0.005	< 0.005	—	11.6
Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Waste	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Total	13.6	2.97	0.05	8.60	8.65	0.05	2.18	2.23	63.9	8,832	8,896	6.77	0.34	14.6	9,181
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.70	0.53	0.01	1.57	1.58	0.01	0.40	0.41	—	1,460	1,460	0.06	0.05	1.99	1,480
Area	1.79	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.92	1.92	< 0.005	< 0.005	—	1.93
Energy	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Water	—	—	—	—	—	—	—	—	0.62	0.00	0.62	0.06	< 0.005	—	2.65
Waste	—	—	—	—	—	—	—	—	9.97	0.00	9.97	1.00	0.00	—	34.9
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
Total	2.49	0.54	0.01	1.57	1.58	0.01	0.40	0.41	10.6	1,462	1,473	1.12	0.06	2.42	1,520

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.98	2.65	0.05	8.66	8.71	0.05	2.19	2.24	—	9,274	9,274	0.35	0.31	28.0	9,403
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.98	2.65	0.05	8.66	8.71	0.05	2.19	2.24	—	9,274	9,274	0.35	0.31	28.0	9,403
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.91	3.13	0.05	8.66	8.71	0.05	2.19	2.24	—	8,866	8,866	0.39	0.34	0.73	8,979
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.91	3.13	0.05	8.66	8.71	0.05	2.19	2.24	—	8,866	8,866	0.39	0.34	0.73	8,979
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.70	0.53	0.01	1.57	1.58	0.01	0.40	0.41	—	1,460	1,460	0.06	0.05	1.99	1,480
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Total	0.70	0.53	0.01	1.57	1.58	0.01	0.40	0.41	—	1,460	1,460	0.06	0.05	1.99	1,480

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.98	2.65	0.05	8.66	8.71	0.05	2.19	2.24	—	9,274	9,274	0.35	0.31	28.0	9,403
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.98	2.65	0.05	8.66	8.71	0.05	2.19	2.24	—	9,274	9,274	0.35	0.31	28.0	9,403
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	3.91	3.13	0.05	8.66	8.71	0.05	2.19	2.24	—	8,866	8,866	0.39	0.34	0.73	8,979
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.91	3.13	0.05	8.66	8.71	0.05	2.19	2.24	—	8,866	8,866	0.39	0.34	0.73	8,979
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.70	0.53	0.01	1.57	1.58	0.01	0.40	0.41	—	1,460	1,460	0.06	0.05	1.99	1,480
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.70	0.53	0.01	1.57	1.58	0.01	0.40	0.41	—	1,460	1,460	0.06	0.05	1.99	1,480

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
City Park	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00

4.3. Area Emissions by Source

4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	8.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.78	0.08	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.5	23.5	< 0.005	< 0.005	—	23.6
Total	10.2	0.08	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.5	23.5	< 0.005	< 0.005	—	23.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	8.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	9.45	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.07	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.92	1.92	< 0.005	< 0.005	—	1.93
Total	1.79	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.92	1.92	< 0.005	< 0.005	—	1.93

4.3.1. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	8.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.78	0.08	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	23.5	23.5	< 0.005	< 0.005	—	23.6
Total	10.2	0.08	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	23.5	23.5	< 0.005	< 0.005	—	23.6
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	8.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	1.44	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	9.45	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.00	0.00	0.00	—	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00
Consumer Products	1.46	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.26	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipment	0.07	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.92	1.92	< 0.005	< 0.005	—	1.93
Total	1.79	0.01	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	1.92	1.92	< 0.005	< 0.005	—	1.93

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
City Park	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
City Park	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	0.62	0.00	0.62	0.06	< 0.005	—	2.65
City Park	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00

Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	0.62	0.00	0.62	0.06	< 0.005	—	2.65

4.4.1. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
City Park	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
City Park	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	3.73	0.00	3.73	0.38	0.01	—	16.0
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	0.62	0.00	0.62	0.06	< 0.005	—	2.65
City Park	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	0.62	0.00	0.62	0.06	< 0.005	—	2.65

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	59.3	0.00	59.3	5.92	0.00	—	207
City Park	—	—	—	—	—	—	—	—	0.93	0.00	0.93	0.09	0.00	—	3.24
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	59.3	0.00	59.3	5.92	0.00	—	207
City Park	—	—	—	—	—	—	—	—	0.93	0.00	0.93	0.09	0.00	—	3.24
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	9.81	0.00	9.81	0.98	0.00	—	34.3
City Park	—	—	—	—	—	—	—	—	0.15	0.00	0.15	0.02	0.00	—	0.54
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	9.97	0.00	9.97	1.00	0.00	—	34.9

4.5.1. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	59.3	0.00	59.3	5.92	0.00	—	207
City Park	—	—	—	—	—	—	—	—	0.93	0.00	0.93	0.09	0.00	—	3.24
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	59.3	0.00	59.3	5.92	0.00	—	207
City Park	—	—	—	—	—	—	—	—	0.93	0.00	0.93	0.09	0.00	—	3.24
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	60.2	0.00	60.2	6.02	0.00	—	211
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	9.81	0.00	9.81	0.98	0.00	—	34.3
City Park	—	—	—	—	—	—	—	—	0.15	0.00	0.15	0.02	0.00	—	0.54
Parking Lot	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	9.97	0.00	9.97	1.00	0.00	—	34.9

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	2.62	2.62
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	0.43	0.43

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	ROG	NOx	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	1,510	1,470	1,470	546,902	12,306	11,983	11,983	4,457,945
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	1,510	1,470	1,470	546,902	12,306	11,983	11,983	4,457,945
City Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parking Lot	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	31
No Fireplaces	124
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.1.2. Mitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	31
No Fireplaces	124
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
741781.7999999999	247,261	0.00	0.00	19,785

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.10.4. Landscape Equipment - Mitigated

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	180

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	962,477	0.00	0.0000	0.0000	0.00
City Park	0.00	0.00	0.0000	0.0000	0.00
Parking Lot	288,860	0.00	0.0000	0.0000	0.00

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	962,477	0.00	0.0000	0.0000	0.00

City Park	0.00	0.00	0.0000	0.0000	0.00
Parking Lot	288,860	0.00	0.0000	0.0000	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	1,946,548	6,369,977
City Park	0.00	2,987,406
Parking Lot	0.00	0.00

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	1,946,548	6,369,977
City Park	0.00	2,987,406
Parking Lot	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	110	—
City Park	1.72	—
Parking Lot	0.00	—

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	110	—
City Park	1.72	—
Parking Lot	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Single Family Housing	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0

City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type
—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.1.2. Mitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

5.18.2.2. Mitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	7.10	annual days of extreme heat
Extreme Precipitation	8.60	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	24.0	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	3	0	0	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	N/A	N/A	N/A	N/A
Extreme Precipitation	3	1	1	3
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	10.6

AQ-PM	19.9
AQ-DPM	46.8
Drinking Water	12.5
Lead Risk Housing	57.1
Pesticides	0.00
Toxic Releases	32.2
Traffic	78.6
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	52.0
Haz Waste Facilities/Generators	76.8
Impaired Water Bodies	0.00
Solid Waste	9.67
Sensitive Population	—
Asthma	62.5
Cardio-vascular	42.0
Low Birth Weights	64.8
Socioeconomic Factor Indicators	—
Education	35.5
Housing	19.4
Linguistic	28.0
Poverty	14.0
Unemployment	40.6

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract

Economic	—
Above Poverty	83.07455409
Employed	94.98267676
Median HI	79.12228923
Education	—
Bachelor's or higher	66.39291672
High school enrollment	100
Preschool enrollment	64.72475298
Transportation	—
Auto Access	59.70742974
Active commuting	59.86141409
Social	—
2-parent households	87.02681894
Voting	85.60246375
Neighborhood	—
Alcohol availability	67.50930322
Park access	38.98370332
Retail density	35.32657513
Supermarket access	61.47824971
Tree canopy	95.41896574
Housing	—
Homeownership	64.41678429
Housing habitability	53.86885667
Low-inc homeowner severe housing cost burden	59.47645323
Low-inc renter severe housing cost burden	29.47517002
Uncrowded housing	50.73784165
Health Outcomes	—

Insured adults	76.20941871
Arthritis	0.0
Asthma ER Admissions	35.8
High Blood Pressure	0.0
Cancer (excluding skin)	0.0
Asthma	0.0
Coronary Heart Disease	0.0
Chronic Obstructive Pulmonary Disease	0.0
Diagnosed Diabetes	0.0
Life Expectancy at Birth	50.2
Cognitively Disabled	82.5
Physically Disabled	18.0
Heart Attack ER Admissions	63.3
Mental Health Not Good	0.0
Chronic Kidney Disease	0.0
Obesity	0.0
Pedestrian Injuries	81.0
Physical Health Not Good	0.0
Stroke	0.0
Health Risk Behaviors	—
Binge Drinking	0.0
Current Smoker	0.0
No Leisure Time for Physical Activity	0.0
Climate Change Exposures	—
Wildfire Risk	0.0
SLR Inundation Area	0.0
Children	51.6

Elderly	12.4
English Speaking	43.4
Foreign-born	57.4
Outdoor Workers	63.3
Climate Change Adaptive Capacity	—
Impervious Surface Cover	71.6
Traffic Density	64.4
Traffic Access	23.0
Other Indices	—
Hardship	24.3
Other Decision Support	—
2016 Voting	76.9

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	29.0
Healthy Places Index Score for Project Location (b)	88.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Based on project description and site plan.
Construction: Construction Phases	Based on data provided by applicant.
Construction: Off-Road Equipment	Based on data provided by project applicant.
Construction: Trips and VMT	Based on data provided by project applicant.
Construction: Architectural Coatings	Architectural coating activities included in vertical construction; default VOC contents and coating areas used.
Operations: Hearths	Project would be all electric; no natural gas fireplaces.
Operations: Energy Use	Project would be all electric.
Operations: Water and Waste Water	Water consumption updated based on water use factors from Water System Hydraulic Evaluation of Crestmoor Residential Development Technical Memorandum (August 2022).
Operations: Vehicle Data	Trip rates adjusted based on transportation data from Fehr & Peers.
Characteristics: Utility Information	The project's electric utility would be Peninsula Clean Energy.

Summary of Mitigated Cancer and Noncancer Health Risks and PM2.5 Concentrations for the MEI

Receptor	Cancer Risk (per million)	Chronic HI	PM2.5 (ug/m3)
MEI (DPM)	2.70	0.003	-
MEI (PM2.5)	-	-	0.1
Threshold	10.0	1.0	0.3

Workbook Tabs Overview



=	summary of HRA results
=	AERMOD inputs/emissions calculations
=	HRA calculations
=	AERMOD outputs - DPM
=	AERMOD outputs - PM

Location	Cancer Risk Impact (per million)	Chronic Non-Cancer Hazard Index (unitless)	Annual PM2.5 Concentration (µg/m3)	
Cumulative Impacts[a]				
Stationary Source	-	-	-	<- from BAAQMD stationary source screening map
Roadway Source	1.4	0.007	0.06	<- from raster data
Rail Source	-	-	-	<- from raster data
Existing Total	1.4	0.0	0.1	
Project construction	2.7	0.003	0.10	<- from project HRA
Total cumulative	4.1	0.010	0.17	<- sum
BAAQMD threshold	100	10.0	0.8	
Exceeds threshold?	No	No	No	

MEIR Coordinates	
X	Y
550,329	4,162,800

STATIONARY

Facililty	Address	NAICS Sub-Sector	Cancer Risk	Chronic Hazard Index	PM2.5	Distance to MEIR (m)	Adjusted Cancer Risk	Adjusted Chronic Hazard Index	Adjusted PM2.5
Verizon Wireless- HWY 35/280	250 Courtland Drive	Telecommunications	7.66	0.0107026	0.0098054	582	-	-	-

Source Inputs

San Bruno Population	42,275	

Offroad Equipment Sources

Source Type: Area	Source I	Source Input Documentation
Average Vehicle Height (m)	5.9	BAAQMD 2022 CEQA Guidelines Appendix E
Vertical Dimension (m)	10.0	BAAQMD 2022 CEQA Guidelines Appendix E
Release Height (RH) (m)	5.0	BAAQMD 2022 CEQA Guidelines Appendix E
Initial vertical dimension (m)	4.7	BAAQMD 2022 CEQA Guidelines Appendix E
Elevation (m)	0	

Offroad Onsite Truck Sources

Source Type: Area		
Average Vehicle Height (m)	4	BAAQMD 2022 CEQA Guidelines Appendix E
Vertical Dimension (m)	6.8	BAAQMD 2022 CEQA Guidelines Appendix E
Release Height (RH) (m)	3.4	BAAQMD 2022 CEQA Guidelines Appendix E
Initial vertical dimension (m)	3.2	BAAQMD 2022 CEQA Guidelines Appendix E
Elevation (m)	0	

Onroad/Truck Sources

Source Type: Line Volume		
Average Vehicle Height (m)	4	BAAQMD 2022 CEQA Guidelines Appendix E
Vertical Dimension (m)	6.8	BAAQMD 2022 CEQA Guidelines Appendix E
Release Height (RH) (m)	3.4	BAAQMD 2022 CEQA Guidelines Appendix E
Initial vertical dimension (m)	3.2	BAAQMD 2022 CEQA Guidelines Appendix E
Elevation (m)	0	

Receptor height	1.5	
Met from San Francisco International Airport		
Elevation (m)	2.4	https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/ceqa-modeling-data

PM10 exhaust = DPM

SUMMARY O

ONSITE DPM - OFFROAD EQUIPMENT

	2024					2025					2026				
Phase	Start date	End date	Days (2024)	PM10 Ex (tons)	PM10 Ex (grams)	Start date	End date	Days (2025)	PM10 Ex (tons)	PM10 Ex (grams)	Start date	End date	Days (2026)	PM10 Ex (tons)	PM10 Ex (grams)
Demolition	12/3/2024	4/1/2025	21	6.2E-04	558.16	12/3/2024	4/1/2025	65	1.6E-03	1,441.19	12/3/2024	4/1/2025	0	0.0E+00	0.00
Rough Grading	1/30/2025	4/1/2025	0	0.0E+00	0.00	1/30/2025	4/1/2025	44	1.5E-02	13,960.28	1/30/2025	4/1/2025	0	0.0E+00	0.00
Wet Utilities	4/2/2025	6/30/2025	0	0.0E+00	0.00	4/2/2025	6/30/2025	64	2.0E-03	1,846.95	4/2/2025	6/30/2025	0	0.0E+00	0.00
Dry Utilities	5/21/2025	7/3/2025	0	0.0E+00	0.00	5/21/2025	7/3/2025	32	3.5E-04	317.45	5/21/2025	7/3/2025	0	0.0E+00	0.00
Building Constructi	7/1/2025	6/4/2026	0	0.0E+00	0.00	7/1/2025	6/4/2026	132	3.0E-02	27,379.22	7/1/2025	6/4/2026	111	2.2E-02	20,178.43
Paving	7/4/2025	9/2/2025	0	0.0E+00	0.00	7/4/2025	9/2/2025	43	5.8E-03	5,275.79	7/4/2025	9/2/2025	0	0.0E+00	0.00
Total	12/3/2024	12/31/2024	21	0.001	558.16	1/1/2025	12/31/2025	261	0.055	50,220.88	1/1/2026	12/31/2026	261	0.022	20,178.43
	12/3/2024	6/4/2026	393												

SUMMARY

Onsite (Equipment)			Onsite (Trucks)			Offsite (Route 2)		
PM10 Ex g	days	g/d	PM10 Ex g	days	g/d	PM10 Ex g	days	g/d
1999.353	86	23.25	2.593	86	0.03	822.880	86	9.57
13960.281	44	317.28	1.320	44	0.03	1196.800	44	27.20
1846.954	64	28.86	1.920	64	0.03	512.000	64	8.00
317.445	32	9.92	0.990	32	0.03	264.000	32	8.25
47557.645	243	195.71	7.264	243	0.03	674.047	243	2.77
5275.792	43	122.69	1.320	43	0.03	352.000	43	8.19
70957.470	512	138.59	15.407	512	0.03	3821.728	512	7.46

seconds/hour	3,600
work hours/day	8
seconds per work d	28,800

ONSITE

OFFROAD EQUIPMENT

Phase	Start date	End date	Days	Days in Bin per OEHHA 3rd tri	Days in Bin per OEHHA 0<2	Days in Bin per OEHHA 2-9	g/day	total g 3rd tri	total g 0<2	total g 2-9	g/sec 3rd tri	g/sec 0<2	g/sec 2-9	g/sec-m2 3rd tri	g/sec-m2 0<2	g/sec-m2 2-9	
Demolition	12/3/2024	4/1/2025	86	66	20		23.25	1,534	465	0	0.00081	0.00081	-	9.84E-09	9.84E-09	-	#REF!
Rough Grading	1/30/2025	4/1/2025	44	24	20		317.28	7,615	6,346	0	0.01102	0.01102	-	1.34E-07	1.34E-07	-	#REF!
Wet Utilities	4/2/2025	6/30/2025	64		64		28.86	0	1,847	0	-	0.00100	-	-	1.22E-08	-	#REF!
Dry Utilities	5/21/2025	7/3/2025	32		32		9.92	0	317	0	-	0.00034	-	-	4.20E-09	-	#REF!
Building Construction	7/1/2025	6/4/2026	243		243		195.71	0	47,558	0	-	0.00680	-	-	8.29E-08	-	#REF!
Paving	7/4/2025	9/2/2025	43		43		122.69	0	5,276	0	-	0.00426	-	-	5.19E-08	-	#REF!
Total				90	422	0		9,149	61,808	0	0.00353	0.00509	-	4.30E-08	6.20E-08	-	
			max per oehha	91	730	2555											
			range of days	12/3/2024	3/5/2025	3/6/2027											
				3/4/2025	3/5/2027	3/4/2034											
				91	730	2555											

OFFROAD ONSITE TRUCKS

Phase	Start date	End date	Days	Days in Bin per OEHHA 3rd tri	Days in Bin per OEHHA 0<2	Days in Bin per OEHHA 2-9	g/day	total g 3rd tri	total g 0<2	total g 2-9	g/sec 3rd tri	g/sec 0<2	g/sec 2-9	g/sec-m2 3rd tri	g/sec-m2 0<2	g/sec-m2 2-9	
Demolition	12/3/2024	4/1/2025	86	66	20	0	0.03	2	1	0	0.00000	0.00000	-	1.28E-11	1.28E-11	-	3
Rough Grading	1/30/2025	4/1/2025	44	24	20	0	0.03	1	1	0	0.00000	0.00000	-	1.27E-11	1.27E-11	-	1
Wet Utilities	4/2/2025	6/30/2025	64	0	64	0	0.03	0	2	0	-	0.00000	-	-	1.27E-11	-	2
Dry Utilities	5/21/2025	7/3/2025	32	0	32	0	0.03	0	1	0	-	0.00000	-	-	1.31E-11	-	1
Building Construction	7/1/2025	6/4/2026	243	0	243	0	0.03	0	7	0	-	0.00000	-	-	1.27E-11	-	7
Paving	7/4/2025	9/2/2025	43	0	43	0	0.03	0	1	0	-	0.00000	-	-	1.30E-11	-	1
Total				90	422	0		3	13	0	0.00000	0.00000	-	1.27E-11	1.27E-11	-	
			max per oehha	91	730	2555											
			range of days	12/3/2024	3/5/2025	3/6/2027											
				3/4/2025	3/5/2027	3/4/2034											
				91	730	2555											

ONROAD

ROUTE 2

Phase	Total Trips in Caleemod Vendor	Total Trips in Caleemod Haul	Caleemod Trip Length Vendor	Caleemod Trip Length Haul	Caleemod Average Roundtrip Length	Aermod Average Roundtrip Length	VMT Scalar	<-- using this to scale onroad PM10 for each phase
Demolition		23.8		20	40	2.84	0.07	
Rough Grading		68		20	40	2.84	0.07	
Wet Utilities		20		20	40	2.84	0.07	
Dry Utilities		20		20	40	2.84	0.07	
Building Construction	16.6		8.4		17	2.84	0.17	
Paving		20		20	40	2.84	0.07	

Phase	Start date	End date	Days	Days in Bin per OEHHA 3rd tri	Days in Bin per OEHHA 0<2	Days in Bin per OEHHA 2-9	g/day, caleemod	g/day, aermod	total g 3rd tri	total g 0<2	total g 2-9	g/sec 3rd tri	g/sec 0<2	g/sec 2-9	
Demolition	12/3/2024	4/1/2025	86	66	20	0	9.57	0.68	45	14	0	2.36E-05	2.36E-05	-	#REF!
Rough Grading	1/30/2025	4/1/2025	44	24	20	0	27.20	1.93	46	39	0	6.71E-05	6.71E-05	-	#REF!
Wet Utilities	4/2/2025	6/30/2025	64	0	64	0	8.00	0.57	0	36	0	-	1.97E-05	-	
Dry Utilities	5/21/2025	7/3/2025	32	0	32	0	8.25	0.59	0	19	0	-	2.04E-05	-	
Building Construction	7/1/2025	6/4/2026	243	0	243	0	2.77	0.47	0	114	0	-	1.63E-05	-	
Paving	7/4/2025	9/2/2025	43	0	43	0	8.19	0.58	0	25	0	-	2.02E-05	-	
Total				90	422	0			91	246	0	3.52E-05	2.03E-05	-	

SUMMARY

Source	3rd tri	0<2	2-9
OFFROAD EQUIPMENT (g/sec/m2)	4.30E-08	6.20E-08	-
ONSITE TRUCKS (g/sec/m2)	1.27E-11	1.27E-11	-
OFFSITE (g/sec)	3.52E-05	2.03E-05	-

ASSUMPTIONS

	Onsite
Area (m2)	82,013.3

Route 2 Segment	Length (m)
CO1	374.1
CO2	276.1
WH	202.7
SH	81.2
280S	1,284.8
IN_280N	1,285.3
IN_WH	419.7
IN_CO1	374.1
IN_CO2	276.1
AERMOD segment	4,574.1
meters to mile	6.21E-04

ONSITE DPM - OFFROAD ONSITE TRUCKS															OFFSITE DPM - ONROAD TRUCKS														
		2024					2025					2026					2024					2025					2026			
Start date	End date	Days (2024)	PM10 Ex (tons)	PM10 Ex (grams)	Start date	End date	Days (2025)	PM10 Ex (tons)	PM10 Ex (grams)	Start date	End date	Days (2026)	PM10 Ex (tons)	PM10 Ex (grams)	Start date	End date	Days (2024)	PM10 Ex (tons)	PM10 Ex (grams)	Start date	End date	Days (2025)	PM10 Ex (tons)	PM10 Ex (grams)	Start date	End date	Days (2026)	PM10 Ex (tons)	PM10 Ex (grams)
12/3/2024	4/1/2025	21	7.3E-07	0.66	12/3/2024	4/1/2025	65	2.1E-06	1.93	12/3/2024	4/1/2025	0	0.0E+00	0.00	#####	4/1/2025	21	2.3E-04	210.82	#####	4/1/2025	65	6.7E-04	612.06	#####	4/1/2025	0	0.0E+00	0.00
1/30/2025	4/1/2025	0	0.0E+00	0.00	1/30/2025	4/1/2025	44	1.5E-06	1.32	1/30/2025	4/1/2025	0	0.0E+00	0.00	#####	4/1/2025	0	0.0E+00	0.00	#####	4/1/2025	44	1.3E-03	1,196.80	#####	4/1/2025	0	0.0E+00	0.00
4/2/2025	6/30/2025	0	0.0E+00	0.00	4/2/2025	6/30/2025	64	2.1E-06	1.92	4/2/2025	6/30/2025	0	0.0E+00	0.00	#####	6/30/2025	0	0.0E+00	0.00	#####	6/30/2025	64	5.6E-04	512.00	#####	########	0	0.0E+00	0.00
5/21/2025	7/3/2025	0	0.0E+00	0.00	5/21/2025	7/3/2025	32	1.1E-06	0.99	5/21/2025	7/3/2025	0	0.0E+00	0.00	#####	7/3/2025	0	0.0E+00	0.00	#####	7/3/2025	32	2.9E-04	264.00	#####	7/3/2025	0	0.0E+00	0.00
7/1/2025	6/4/2026	0	0.0E+00	0.00	7/1/2025	6/4/2026	132	4.3E-06	3.94	7/1/2025	6/4/2026	111	3.7E-06	3.32	#####	6/4/2026	0	0.0E+00	0.00	#####	6/4/2026	132	4.0E-04	365.85	#####	6/4/2026	111	3.4E-04	308.19
7/4/2025	9/2/2025	0	0.0E+00	0.00	7/4/2025	9/2/2025	43	1.5E-06	1.32	7/4/2025	9/2/2025	0	0.0E+00	0.00	#####	9/2/2025	0	0.0E+00	0.00	#####	9/2/2025	43	3.9E-04	352.00	#####	9/2/2025	0	0.0E+00	0.00
12/3/2024	12/31/2024	21	0.000	0.66	1/1/2025	12/31/2025	261	0.000	11.42	1/1/2026	12/31/2026	261	0.000	3.32				0.00023	210.82				0.00364	3,302.71				0.00034	308.19
12/3/2024	6/4/2026	393																											

DPM

ONSITE PM - OFFROAD EQUIPMENT

	2024					2025					2026				
Phase	Start date	End date	Days (2024)	PM2.5 (tons)	PM2.5 (grams)	Start date	End date	Days (2025)	PM2.5 (tons)	PM2.5 (grams)	Start date	End date	Days (2026)	PM2.5 (tons)	PM2.5 (grams)
Demolition	12/3/2024	4/1/2025	21	4.3E-03	3866.584	12/3/2024	4/1/2025	65	1.2E-02	11060.637	12/3/2024	4/1/2025	0	0.0E+00	0.000
Rough Grading	1/30/2025	4/1/2025	0	0.0E+00	0.000	1/30/2025	4/1/2025	44	2.4E-02	21733.365	1/30/2025	4/1/2025	0	0.0E+00	0.000
Wet Utilities	4/2/2025	6/30/2025	0	0.0E+00	0.000	4/2/2025	6/30/2025	64	1.9E-03	1699.197	4/2/2025	6/30/2025	0	0.0E+00	0.000
Dry Utilities	5/21/2025	7/3/2025	0	0.0E+00	0.000	5/21/2025	7/3/2025	32	3.2E-04	292.050	5/21/2025	7/3/2025	0	0.0E+00	0.000
Building Construct	7/1/2025	6/4/2026	0	0.0E+00	0.000	7/1/2025	6/4/2026	132	2.8E-02	25188.878	7/1/2025	6/4/2026	111	2.0E-02	18564.156
Paving	7/4/2025	9/2/2025	0	0.0E+00	0.000	7/4/2025	9/2/2025	43	5.4E-03	4853.728	7/4/2025	9/2/2025	0	0.0E+00	0.000
Total	12/3/2024	12/31/2024	21	0.004	3866.584	1/1/2025	12/31/2025	261	0.071	64827.855	1/1/2026	12/31/2026	261	0.020	18564.156
	12/3/2024	6/4/2026	393												

SUMMARY

Onsite (Equipment)			Onsite (Trucks)			Offsite (Route 2)		
PM2.5 g	days	g/d	PM2.5 g	days	g/d	PM2.5 g	days	g/d
14927.221	86	173.572	8514.072	86	99.00	17339.264	86	201.619
21733.365	44	493.940	4334.437	44	98.51	24060.328	44	546.826
1699.197	64	26.550	6304.635	64	98.51	11958.062	64	186.845
292.050	32	9.127	3250.828	32	101.59	5679.421	32	177.482
43753.034	243	180.054	23853.475	243	98.16	62094.446	243	255.533
4853.728	43	112.877	4334.437	43	100.80	8221.168	43	191.190
87258.595	512	170.427	50591.884	512	98.81	129352.688	512	252.642

seconds/hour	3,600
work hours/day	8
seconds per work day	28,800

ONSITE

OFFROAD EQUIPMENT

				Days per Year			g/day	total g			g/sec			g/sec-m2			
Phase	Start date	End date	Days	2024	2025	2026		2024	2025	2026	2024	2025	2026	2024	2025	2026	
Demolition	12/3/2024	4/1/2025	86	21	65	0	173.57	3,645	11,282	0	0.00603	0.00603	-	7.35E-08	7.35E-08	-	#REF!
Rough Grading	1/30/2025	4/1/2025	44	0	44	0	493.94	0	21,733	0	-	0.01715	-	-	2.09E-07	-	#REF!
Wet Utilities	4/2/2025	6/30/2025	64	0	64	0	26.55	0	1,699	0	-	0.00092	-	-	1.12E-08	-	#REF!
Dry Utilities	5/21/2025	7/3/2025	32	0	32	0	9.13	0	292	0	-	0.00032	-	-	3.86E-09	-	#REF!
Building Construction	7/1/2025	6/4/2026	243	0	132	111	180.05	0	23,767	19,986	-	0.00625	0.00625	-	7.62E-08	7.62E-08	#REF!
Paving	7/4/2025	9/2/2025	43	0	43	0	112.88	0	4,854	0	-	0.00392	-	-	4.78E-08	-	#REF!
Total				21	380	111		3,645	63,628	19,986	0.00603	0.00581	0.00625	7.35E-08	7.09E-08	7.62E-08	

OFFROAD ONSITE TRUCKS

				Days per Year			g/day	total g			g/sec			g/sec-m2			
Phase	Start date	End date	Days	2024	2025	2026		3rd tri	0<2	2-9	2024	2025	2026	2024	2025	2026	
Demolition	12/3/2024	4/1/2025	86	21	65	0	99.00	2,079	6,435	0	0.00344	0.00344	-	1.70E-05	1.70E-05	-	8514
Rough Grading	1/30/2025	4/1/2025	44	0	44	0	98.51	0	4,334	0	-	0.00342	-	-	1.69E-05	-	4334
Wet Utilities	4/2/2025	6/30/2025	64	0	64	0	98.51	0	6,305	0	-	0.00342	-	-	1.69E-05	-	6305
Dry Utilities	5/21/2025	7/3/2025	32	0	32	0	101.59	0	3,251	0	-	0.00353	-	-	1.74E-05	-	3251
Building Construction	7/1/2025	6/4/2026	243	0	132	111	98.16	0	12,957	10,896	-	0.00341	0.00341	-	1.68E-05	1.68E-05	23853
Paving	7/4/2025	9/2/2025	43	0	43	0	100.80	0	4,334	0	-	0.00350	-	-	1.73E-05	-	4334
Total				21	380	111		2,079	37,617	10,896	0.00344	0.00344	0.00341	4.19E-08	4.19E-08	4.16E-08	

ONROAD

ROUTE 2

	Total Trips in Caleemod			Caleemod Trip Length			Caleemod Average Roundtrip Length	Aermod Average Roundtrip Length	VMT scalar	<-- using this to scale onroad PM2.5 for each phase
Phase	Worker	Vendor	Haul	Worker	Vendor	Haul				
Demolition	6		23.8	11.7		20	37	2.84	0.08	
Rough Grading	10		68	11.7		20	38	2.84	0.08	
Wet Utilities	10		20	11.7		20	34	2.84	0.08	
Dry Utilities	6		20	11.7		20	36	2.84	0.08	
Building Construction	55.8	16.6		11.7	8.4		22	2.84	0.13	
Paving	10		20	11.7		20	34	2.84	0.08	

				Days per Year			g/day, caleemod	g/day, aermod	total g			g/sec			
Phase	Start date	End date	Days	2024	2025	2026			2024	2025	2026	2024	2025	2026	
Demolition	12/3/2024	4/1/2025	86	21	65	0	201.62	15.63	328	1,016	0	5.43E-04	5.43E-04	-	#REF!
Rough Grading	1/30/2025	4/1/2025	44	0	44	0	546.83	41.04	0	1,806	0	-	1.42E-03	-	#REF!
Wet Utilities	4/2/2025	6/30/2025	64	0	64	0	186.84	15.41	0	986	0	-	5.35E-04	-	
Dry Utilities	5/21/2025	7/3/2025	32	0	32	0	177.48	13.95	0	446	0	-	4.84E-04	-	
Building Construction	7/1/2025	6/4/2026	243	0	132	111	255.53	33.18	0	4,380	3,683	-	1.15E-03	1.15E-03	
Paving	7/4/2025	9/2/2025	43	0	43	0	191.19	15.77	0	678	0	-	5.47E-04	-	
Total				21	380	111			328	9,312	3,683	5.43E-04	8.51E-04	1.15E-03	

SUMMARY (g/sec/m2)

Source	2024	2025	2026
ONSITE - EQUIPMENT (g/sec/m2)	7.35E-08	7.09E-08	7.62E-08
ONSITE - TRUCKS (g/sec/m2)	4.19E-08	4.19E-08	4.16E-08
OFFSITE (g/sec)	5.43E-04	8.51E-04	1.15E-03

ASSUMPTIONS

	Onsite
Area (m2)	82,013.3

Route 2 Segment	Length (m)
CO1	374.1
CO2	276.1
WH	202.7
SH	81.2
280S	1,284.8
IN_280N	1,285.3
IN_WH	419.7
IN_CO1	374.1
IN_CO2	276.1
AERMOD segment	4,574.1
meters to mile	6.21E-04

ONSITE PM - ONSITE TRUCKS														OFFSITE PM - ONROAD TRUCKS											
2024					2025					2026					2024					2025					2026			
Start date	End date	Days (2024)	PM2.5 (tons)	PM2.5 (grams)	Start date	End date	Days (2025)	PM2.5 (tons)	PM2.5 (grams)	Start date	End date	Days (2026)	PM2.5 (tons)	PM2.5 (grams)	Start date	End date	Days (2024)	PM2.5 (tons)	PM2.5 (grams)	Start date	End date	Days (2025)	PM2.5 (tons)	PM2.5 (grams)	Start date	End date	Days (2026)	PM2.5 (tons)
12/3/2024	4/1/2025	21	2.4E-03	2181.291	12/3/2024	4/1/2025	65	7.0E-03	6332.781	12/3/2024	4/1/2025	0	0.0E+00	0.000	########	4/1/2025	21	4.9E-03	4442.291	########	4/1/2025	65	1.4E-02	12896.973	12/3/2024	4/1/2025	0	0.0E+00
1/30/2025	4/1/2025	0	0.0E+00	0.000	1/30/2025	4/1/2025	44	4.8E-03	4334.437	1/30/2025	4/1/2025	0	0.0E+00	0.000	########	4/1/2025	0	0.0E+00	0.000	########	4/1/2025	44	2.7E-02	24060.328	1/30/2025	4/1/2025	0	0.0E+00
4/2/2025	6/30/2025	0	0.0E+00	0.000	4/2/2025	6/30/2025	64	6.9E-03	6304.635	4/2/2025	6/30/2025	0	0.0E+00	0.000	4/2/2025	6/30/2025	0	0.0E+00	0.000	4/2/2025	6/30/2025	64	1.3E-02	11958.062	4/2/2025	6/30/2025	0	0.0E+00
5/21/2025	7/3/2025	0	0.0E+00	0.000	5/21/2025	7/3/2025	32	3.6E-03	3250.828	5/21/2025	7/3/2025	0	0.0E+00	0.000	########	7/3/2025	0	0.0E+00	0.000	########	7/3/2025	32	6.3E-03	5679.421	5/21/2025	7/3/2025	0	0.0E+00
7/1/2025	6/4/2026	0	0.0E+00	0.000	7/1/2025	6/4/2026	132	1.4E-02	12947.019	7/1/2025	6/4/2026	111	1.2E-02	10906.456	7/1/2025	6/4/2026	0	0.0E+00	0.000	7/1/2025	6/4/2026	132	3.7E-02	33703.180	7/1/2025	6/4/2026	111	3.1E-02
7/4/2025	9/2/2025	0	0.0E+00	0.000	7/4/2025	9/2/2025	43	4.8E-03	4334.437	7/4/2025	9/2/2025	0	0.0E+00	0.000	7/4/2025	9/2/2025	0	0.0E+00	0.000	7/4/2025	9/2/2025	43	9.1E-03	8221.168	7/4/2025	9/2/2025	0	0.0E+00
1/0/1900	12/31/2024	32612	0.002	2181.291	1/1/2025	12/31/2025	261	0.041	37504.136	1/1/2026	12/31/2026	261	0.012	10906.456				0.00490	4442.291				0.10639	96519.132				0.03130

days sum	
86	
44	
64	
32	
243	
43	
512	#REF!

days sum	
86	
44	
64	
32	
243	
43	
512	#REF!

qc

	seconds	604800	10944000
grams		328.2787018	9312.334778

Dose-air = Cair * {BR/BW} * A * EF * 10^-6

{BR/BW} = Daily breathing rate

	Age Bin A	Age Bin B	
Receptor Type	3rd trimester	0<2	Source
RES	361	1090	BAAQMD 2022 CEQA Guidelines
REC	361	1090	BAAQMD 2022 CEQA Guidelines
Receptor Type	0<2	2<9	
SCH	1090	520	BAAQMD 2022 CEQA Guidelines
Receptor Type	16<30	16-70	
WOR	230	230	BAAQMD 2022 CEQA Guidelines

A = Inhalation absorption factor (unitless)

Receptor Type	3rd trimester	0<2	Source
RES	1	1	OEHHA 2015, page 5-24
REC	1	1	
Receptor Type	0<2	2<9	
SCH	1	1	
Receptor Type	16<30	16-70	
WOR	1	1	

EF = Exposure frequency (unitless), days/365 days

Receptor Type	3rd trimester	0<2	Source
RES	0.96	0.96	350 days/yr; BAAQMD 2022 CEQA Guidelines
REC	0.96	0.96	350 days/yr; BAAQMD 2022 CEQA Guidelines
Receptor Type	0<2	2<9	
SCH	0.96	0.96	350 days/yr; BAAQMD 2022 CEQA Guidelines
Receptor Type	16<30	16-70	
WOR	0.68	0.68	250 days/yr; BAAQMD 2022 CEQA Guidelines

Mulitplier

Receptor Type	3rd trimester	0<2
RES	3.46E-04	1.05E-03
REC	3.46E-04	1.05E-03
Receptor Type	0<2	2<9
SCH	1.05E-03	4.99E-04
Receptor Type	16<30	16-70
WOR	1.58E-04	1.58E-04

RISKinh-res = DOSEair * CPF * ASF * ED/AT * FAH

CPF = CPF, DPM ([mg/kg-day]-1)

	Age Bin A	Age Bin	
Receptor Type	3rd trimester	0<2	Source
RES	1.1	1.1	
REC	1.1	1.1	
Receptor Type	0<2	2<9	
SCH	1.1	1.1	
Receptor Type	16<30	16-70	
WOR	1.1	1.1	

ASF = Average Age Sensitivity Factor

Receptor Type	3rd trimester	0<2	Source
RES	10	10	BAAQMD 2022 CEQA Guidelines
REC	10	10	
Receptor Type	0<2	2<9	
SCH	10	3	
Receptor Type	16<30	16-70	
WOR	1	1	

ED = Exposure Duration (years)

Receptor Type	3rd trimester	0<2	Source
RES	0.25	1.2	Equation 8.2.4 A, OEHHA 2015
REC	0.25	1.2	
Receptor Type	0<2	2<9	
SCH	1.5	0.0	
Receptor Type	16<30	16-70	
WOR	1.5	0.0	

AT = Average Time (days)

Receptor Type	3rd trimester	0<2	Source
RES	70	70	Averaging time for lifetime cancer risk
REC	70	70	
Receptor Type	0<2	2<9	
SCH	70	70	
Receptor Type	16<30	16-70	
WOR	70	70	

FAH = Fraction of Time at Home

Receptor Type	3rd trimester	0<2	Source
RES	1	1	BAAQMD 2022 CEQA Guidelines
REC	N/A	N/A	
Receptor Type	0<2	2<9	
SCH	N/A	N/A	
Receptor Type	16<30	16-70	
WOR	N/A	N/A	

WAF = Adjustment Factor

Receptor Type	3rd trimester	0<2	Source
RES	1	1	OEHHA 2015, Page 4-44 and Equation 4.1; exposure is adjusted upward to account for overlapping daytime exposure.
REC	0.63	0.63	WAF = (8 hours/24 hours) * (5 days/7 days); discount factor: recreational hours overlap with source 2 hours/day, 3 days/week
Receptor Type	0<2	2<9	
SCH	4.2	4.2	
Receptor Type	16<30	16-70	
WOR	4.2	4.2	

Mulitplier

Receptor Type	3rd trimester	0<2
RES	3.93E-02	1.96E-01
REC	2.48E-02	1.24E-01
Receptor Type	0<2	2<9
SCH	9.90E-01	0.00E+00
Receptor Type	16<30	16-70
WOR	9.91E-02	0.00E+00

$$Dose\text{-}air = C_{air} \times (BR/BW) \times A \times EF \times 10^{-6}$$

$$RISK_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times ED/AT \times FAH$$

Rec ID	Receptors X	Receptors Y	Type	Concentration Age Bin A	Concentration Age Bin B	Dose Inhalation by Bin Age Bin A	Dose Inhalation by Bin Age Bin B	Cancer Risk by Bin Age Bin A	Cancer Risk by Bin Age Bin B	Sum of Cancer Risk Summed Risk	Sum of Cancer Risk Cases per Million	Chronic Hazard Index	Rec ID	X	Y
1	550249	4162439.51	RES	9.20E-04	1.29E-03	3.18E-07	1.35E-06	1.25E-08	2.65E-07	2.8E-07	0.277213851	2.58E-04	1	550249	4162439.51
2	550269	4162439.51	RES	9.30E-04	1.31E-03	3.22E-07	1.37E-06	1.26E-08	2.69E-07	2.8E-07	0.281453758	2.62E-04	2	550269	4162439.51
3	550289	4162439.51	RES	9.40E-04	1.32E-03	3.25E-07	1.38E-06	1.28E-08	2.71E-07	2.8E-07	0.283641709	2.64E-04	3	550289	4162439.51
4	550309	4162439.51	RES	9.50E-04	1.34E-03	3.29E-07	1.40E-06	1.29E-08	2.75E-07	2.9E-07	0.287881616	2.68E-04	4	550309	4162439.51
5	550329	4162439.51	RES	9.50E-04	1.32E-03	3.29E-07	1.38E-06	1.29E-08	2.71E-07	2.8E-07	0.283777702	2.64E-04	5	550329	4162439.51
6	550349	4162439.51	RES	9.30E-04	1.30E-03	3.22E-07	1.36E-06	1.26E-08	2.67E-07	2.8E-07	0.279401801	2.60E-04	6	550349	4162439.51
7	550369	4162439.51	RES	9.00E-04	1.26E-03	3.12E-07	1.32E-06	1.22E-08	2.59E-07	2.7E-07	0.270785993	2.52E-04	7	550369	4162439.51
8	550389	4162439.51	RES	8.60E-04	1.20E-03	2.98E-07	1.25E-06	1.17E-08	2.46E-07	2.6E-07	0.257930277	2.40E-04	8	550389	4162439.51
9	550549	4162439.51	RES	6.80E-04	8.50E-04	2.35E-07	8.88E-07	9.25E-09	1.74E-07	1.8E-07	0.183663898	1.70E-04	9	550549	4162439.51
10	550569	4162439.51	RES	6.10E-04	7.70E-04	2.11E-07	8.05E-07	8.30E-09	1.58E-07	1.7E-07	0.166296288	1.54E-04	10	550569	4162439.51
11	550589	4162439.51	RES	5.60E-04	7.10E-04	1.94E-07	7.42E-07	7.62E-09	1.46E-07	1.5E-07	0.153304579	1.42E-04	11	550589	4162439.51
12	550609	4162439.51	RES	5.10E-04	6.60E-04	1.77E-07	6.90E-07	6.94E-09	1.35E-07	1.4E-07	0.142364827	1.32E-04	12	550609	4162439.51
13	550629	4162439.51	RES	4.60E-04	6.10E-04	1.59E-07	6.38E-07	6.26E-09	1.25E-07	1.3E-07	0.131425075	1.22E-04	13	550629	4162439.51
14	550649	4162439.51	REC	4.30E-04	5.60E-04	1.49E-07	5.85E-07	3.68E-09	7.24E-08	7.6E-08	0.076077105	1.12E-04	14	550649	4162439.51
15	550669	4162439.51	REC	4.00E-04	5.30E-04	1.38E-07	5.54E-07	3.43E-09	6.85E-08	7.2E-08	0.071941879	1.06E-04	15	550669	4162439.51
16	550689	4162439.51	REC	3.70E-04	5.00E-04	1.28E-07	5.23E-07	3.17E-09	6.46E-08	6.8E-08	0.067806653	1.00E-04	16	550689	4162439.51
17	550709	4162439.51	REC	3.50E-04	4.70E-04	1.21E-07	4.91E-07	3.00E-09	6.08E-08	6.4E-08	0.063757102	9.40E-05	17	550709	4162439.51
18	550729	4162439.51	REC	3.40E-04	4.50E-04	1.18E-07	4.70E-07	2.91E-09	5.82E-08	6.1E-08	0.06108596	9.00E-05	18	550729	4162439.51
19	550749	4162439.51	REC	3.20E-04	4.30E-04	1.11E-07	4.49E-07	2.74E-09	5.56E-08	5.8E-08	0.058329143	8.60E-05	19	550749	4162439.51
20	550769	4162439.51	REC	3.20E-04	4.30E-04	1.11E-07	4.49E-07	2.74E-09	5.56E-08	5.8E-08	0.058329143	8.60E-05	20	550769	4162439.51
21	550789	4162439.51	REC	3.20E-04	4.30E-04	1.11E-07	4.49E-07	2.74E-09	5.56E-08	5.8E-08	0.058329143	8.60E-05	21	550789	4162439.51
22	550809	4162439.51	REC	3.20E-04	4.40E-04	1.11E-07	4.60E-07	2.74E-09	5.69E-08	6.0E-08	0.059621876	8.80E-05	22	550809	4162439.51
23	550829	4162439.51	REC	3.30E-04	4.40E-04	1.14E-07	4.60E-07	2.83E-09	5.69E-08	6.0E-08	0.059707552	8.80E-05	23	550829	4162439.51
24	550849	4162439.51	REC	3.30E-04	4.50E-04	1.14E-07	4.70E-07	2.83E-09	5.82E-08	6.1E-08	0.061000285	9.00E-05	24	550849	4162439.51
25	550869	4162439.51	REC	3.30E-04	4.50E-04	1.14E-07	4.70E-07	2.83E-09	5.82E-08	6.1E-08	0.061000285	9.00E-05	25	550869	4162439.51
26	550889	4162439.51	REC	3.30E-04	4.50E-04	1.14E-07	4.70E-07	2.83E-09	5.82E-08	6.1E-08	0.061000285	9.00E-05	26	550889	4162439.51
27	550909	4162439.51	REC	3.30E-04	4.60E-04	1.14E-07	4.81E-07	2.83E-09	5.95E-08	6.2E-08	0.062293018	9.20E-05	27	550909	4162439.51
28	550929	4162439.51	REC	3.30E-04	4.60E-04	1.14E-07	4.81E-07	2.83E-09	5.95E-08	6.2E-08	0.062293018	9.20E-05	28	550929	4162439.51
29	550949	4162439.51	REC	3.20E-04	4.40E-04	1.11E-07	4.60E-07	2.74E-09	5.69E-08	6.0E-08	0.059621876	8.80E-05	29	550949	4162439.51
30	550969	4162439.51	REC	3.00E-04	4.20E-04	1.04E-07	4.39E-07	2.57E-09	5.43E-08	5.7E-08	0.056865058	8.40E-05	30	550969	4162439.51
31	550989	4162439.51	REC	3.10E-04	4.20E-04	1.07E-07	4.39E-07	2.66E-09	5.43E-08	5.7E-08	0.056950734	8.40E-05	31	550989	4162439.51
32	551009	4162439.51	REC	3.10E-04	4.40E-04	1.07E-07	4.60E-07	2.66E-09	5.69E-08	6.0E-08	0.0595362	8.80E-05	32	551009	4162439.51
33	551029	4162439.51	REC	3.30E-04	4.50E-04	1.14E-07	4.70E-07	4.49E-09	9.23E-08	9.7E-08	0.096825849	9.00E-05	33	551029	4162439.51
34	551049	4162439.51	REC	3.30E-04	4.60E-04	1.14E-07	4.81E-07	4.49E-09	9.44E-08	9.9E-08	0.098877806	9.20E-05	34	551049	4162439.51
35	551069	4162439.51	REC	3.40E-04	4.80E-04	1.18E-07	5.02E-07	4.62E-09	9.85E-08	1.0E-07	0.103117713	9.60E-05	35	551069	4162439.51
36	551109	4162439.51	REC	3.40E-04	4.80E-04	1.18E-07	5.02E-07	4.62E-09	9.85E-08	1.0E-07	0.103117713	9.60E-05	36	551109	4162439.51
37	550249	4162459.51	RES	9.70E-04	1.36E-03	3.36E-07	1.42E-06	1.32E-08	2.79E-07	2.9E-07	0.292257517	2.72E-04	37	550249	4162459.51
38	550269	4162459.51	RES	9.90E-04	1.39E-03	3.43E-07	1.45E-06	1.35E-08	2.85E-07	3.0E-07	0.298685375	2.78E-04	38	550269	4162459.51
39	550289	4162459.51	RES	1.00E-03	1.40E-03	3.46E-07	1.46E-06	1.36E-08	2.87E-07	3.0E-07	0.300873325	2.80E-04	39	550289	4162459.51
40	550309	4162459.51	RES	1.01E-03	1.42E-03	3.50E-07	1.48E-06	1.37E-08	2.91E-07	3.1E-07	0.305113233	2.84E-04	40	550309	4162459.51
41	550329	4162459.51	RES	1.01E-03	1.42E-03	3.50E-07	1.48E-06	1.37E-08	2.91E-07	3.1E-07	0.305113233	2.84E-04	41	550329	4162459.51
42	550369	4162459.51	RES	9.80E-04	1.36E-03	3.39E-07	1.42E-06	1.33E-08	2.79E-07	2.9E-07	0.29239351	2.72E-04	42	550369	4162459.51
43	550389	4162459.51	RES	9.30E-04	1.29E-03	3.22E-07	1.35E-06	1.26E-08	2.65E-07	2.8E-07	0.277349844	2.58E-04	43	550389	4162459.51
44	550549	4162459.51	RES	7.70E-04	9.30E-04	2.67E-07	9.72E-07	1.05E-08	1.91E-07	2.0E-07	0.201303494	1.86E-04	44	550549	4162459.51
45	550569	4162459.51	RES	6.70E-04	8.40E-04	2.32E-07	8.78E-07	9.11E-09	1.72E-07	1.8E-07	0.181475947	1.68E-04	45	550569	4162459.51
46	550589	4162459.51	RES	6.10E-04	7.70E-04	2.11E-07	8.05E-07	8.30E-09	1.58E-07	1.7E-07	0.166296288	1.54E-04	46	550589	4162459.51
47	550609	4162459.51	RES	5.50E-04	7.10E-04	1.90E-07	7.42E-07	7.48E-09	1.46E-07	1.5E-07	0.153168586	1.42E-04	47	550609	4162459.51
48	550629	4162459.51	RES	5.00E-04	6.50E-04	1.73E-07	6.79E-07	6.80E-09	1.33E-07	1.4E-07	0.140176877	1.30E-04	48	550629	4162459.51
49	550649	4162459.51	REC	4.60E-04	6.00E-04	1.59E-07	6.27E-07	3.94E-09	7.76E-08	8.2E-08	0.081505064	1.20E-04	49	550649	4162459.51
50	550669	4162459.51	REC	4.20E-04	5.60E-04	1.45E-07	5.85E-07	3.60E-09	7.24E-08	7.6E-08	0.075991429	1.12E-04	50	550669	4162459.51
51	550689	4162459.51	REC	3.90E-04	5.20E-04	1.35E-07	5.44E-07	3.34E-09	6.72E-08	7.1E-08	0.07056347	1.04E-04	51	550689	4162459.51
52	550709	4162459.51	REC	3.70E-04	4.90E-04	1.28E-07	5.12E-07	3.17E-09	6.33E-08	6.7E-08	0.06651392	9.80E-05	52	550709	4162459.51
53	550729	4162459.51	REC	3.50E-04	4.80E-04	1.21E-07	5.02E-07	3.00E-09	6.21E-08	6.5E-08	0.065049835	9.60E-05	53	550729	4162459.51
54	550749	4162459.51	REC	3.40E-04	4.60E-04	1.18E-07	4.81E-07	2.91E-09	5.95E-08	6.2E-08	0.062378693	9.20E-05	54	550749	4162459.51
55	550769	4162459.51	REC	3.40E-04	4.60E-04	1.18E-07	4.81E-07	2.91E-09	5.95E-08	6.2E-08	0.062378693	9.20E-05	55	550769	4162459.51
56	550789	4162459.51	REC	3.40E-04	4.70E-04	1.18E-07	4.91E-07	2.91E-09	6.08E-08	6.4E-08	0.063671426	9.40E-05	56	550789	4162459.51
57	550809	4162459.51	REC	3.50E-04	4.80E-04	1.21E-07	5.02E-07	3.00E-09	6.21E-08	6.5E-08	0.065049835	9.60E-05	57	550809	4162459.51
58	550829	4162459.51	REC	3.60E-04	4.90E-04	1.25E-07	5.12E-07	3.08E-09	6.33E-08	6.6E-08	0.066428244	9.80E-05	58	550829	4162459.51
59	550849	4162459.51	REC	3.60E-04	5.00E-04	1.25E-07	5.23E-07	3.08E-09	6.46E-08	6.8E-08	0.067720977	1.00E-04	59	550849	4162459.51
60	550869	4162459.51	REC	3.60E-04	5.00E-04	1.25E-07	5.23E-07	3.08E-09	6.46E-08	6.8E-08	0.067720977	1.00E-04	60	550869	4162459.51
61	550889	4162459.51	REC	3.70E-04	5.00E-04	1.28E-07	5.23E-07	3.17E-09	6.46E-08	6.8E-08	0.067806653	1.00E-04	61	550889	4162459.51
62	550909	4162459.51	REC	3.70E-04	5.10E-04	1.28E-07	5.33E-07	3.17E-09	6.59E-08	6.9E-08	0.069099386	1.02E-04	62	550909	4162459.51
63	550929	4162459.51	REC	3.70E-04	5.10E-04	1.28E-07	5.33E-07	3.17E-09	6.59E-08	6.9E-08	0.069099386	1.02E-04	63	550929	4162459.51
64	550949	4162459.51	REC	3.50E-04	4.80E-04	1.21E-07	5.02E-07	3.00E-09	6.21E-08	6.5E-08	0.065049835	9.60E-05	64	550949	4162459.51
65	550969	4162459.51	REC	3.40E-04	4.70E-04	1.18E-07	4.91E-07	2.91E-09	6.08E-08	6.4E-08	0.063671426	9.40E-05	65	550969	4162459.51
66	550989	4162459.51	REC	3.30E-04	4.60E-04	1.14E-07	4.81E-07	2.83E-09	5.95E-08	6.2E-08	0.062293018	9.20E-05	66	550989	4162459.51
67	551009	4162459.51	REC	3.30E-04	4.60E-04	1.14E-07	4.81E-07	2.83E-09	5.95E-08	6.2E-08	0.062293018	9.20E-05	67	551009	4162459.51
68	551029	4162459.51	REC	3.50E-04	4.80E-04	1.21E-07	5.02E-07	3.00E-09	6.21E-08	6.5E-08	0.065049835	9.60E-05	68	551029	4162459.51
69	551049	4162459.51	REC	3.60E-04	5.10E-04	1.25E-07	5.33E-07	3.08E-09	6.59E-08	6.9E-08	0.06901371	1.02E-04	69	551049	4162459.51
70	551069	4162459.51	REC	3.70E-04	5.20E-04	1.28E-07	5.44E-07	5.03E-09	1.07E-07	1.1E-07	0.111733522	1.04E-04	70	551069	4162459.51
71	551089	4162459.51	REC	3.80E-04	5.30E-04	1.32E-07	5.54E-07	5.17E-09	1.09E-07	1.1E-07	0.113921472	1.06E-04	71	551089	4162459.51
72	551109	4162459.51	REC	3.80E-04	5.30E-04	1.32E-07	5.54E-07	5.17E-09	1.09E-07	1.1E-07	0.113921472	1.06E-04	72	551109	4162459.51
73	550229	4162479.51	RES	9.90E-04	1.39E-03	3.43E-07	1.45E-06	1.35E-08	2.85E-07	3.0E-07	0.298685375	2.78E-04	73	550229	4162479.51
74	550249	4162479.51	RES	1.02E-03	1.44E-03	3.53E-07	1.51E-06	1.39E-08	2.95E-07	3.1E-07	0.30935314	2.88E-04	74	550249	4162479.51
75	550269	4162479.51	RES	1.05E-03	1.48E-03	3.63E-07	1.55E-06	1.43E-08	3.04E-07	3.2E-07	0.317968949	2.96E-04	75	550269	4162479.51
76	550289	4162479.51	RES	1.07E-03	1.50E-03	3.70E-07	1.57E-06	1.46E-08	3.08E-07	3.2E-07	0.322344849	3.00E-04	76	550289	4162479.51
77	550309	4162479.51	RES	1.08E-03	1.52E-03	3.74E-07	1.59E-06	1.47E-08	3.12E-07	3.3E-07	0.326584757	3.04E-04	77	550309	4162479.51
78	550329	4162479.51	RES	1.08E-03	1.52E-03	3.74E-07	1.59E-06	1.47E-08	3.12E-07	3.3E-07	0.326584757	3.04E-04	78	550329	4162479.51
79	550349	4162479.51	RES	1.09E-03	1.52E-03	3.77E-07	1.59E-06	1.48E-08	3.12E-07	3.3E-07	0.32672075	3.04E-04	79	550349	4162479.51
80	550369	4162479.51	RES	1.06E-03	1.48E-03	3.67E-07	1.55E-06	1.44E-08	3.04E-07	3.2E-07	0.318104942	2.96E-04	80	550369	4162479.51
81	550389	4162479.51	RES	1.01E-03	1.41E-03	3.50E-07	1.47E-06	1.37E-08	2.89E-07	3.0E-07	0.303061276	2.82E-04	81	550389	4162479.51
82	550549	4162479.51	RES	8.40E-04	1.01E-03	2.91E-07	1.06E-06	1.14E-08	2.07E-07	2.2E-07	0.218671103	2.02E-04	82	550549	4162479.51
83	550569	4162479.51	RES	7.40E-04	9.10E-04	2.56E-07	9.51E-07	1.01E-08	1.87E-07	2.0E-07	0.1967916	1.82E-04	83	550569	4162479.51
84	550589	4162479.51	RES	6.60E-04	8.40E-04	2.28E-07	8.78E-07	8.98E-09	1.72E-07	1.8E-07	0.181339954	1.68E-04	84	550589	4162479.51
85	550609	4162479.51	RES	6.00E-04	7.70E-04	2.08E-07	8.05E-07	8.16E-09	1.58E-07	1.7E-07	0.166160295	1.54E-04	85	550609	4162479.51
86	550629	4162479.51	RES	5.50E-04	7.10E-04	1.90E-07	7.42E-07	7.48E-09	1.46E-07	1.5E-07	0.153168586	1.42E-04	86	550629	4162479.51
87	550649	4162479.51	REC	4.90E-04	6.50E-04	1.70E-07	6.79E-07	4.20E-09	8.40E-08	8.8E-08	0.088225757	1.30E-04	87	550649	4162479.51
88	550669	4162479.51	REC	4.50E-04	6.00E-04	1.56E-07	6.27E-07	3.86E-09	7.76E-08	8.1E-08	0.081419389	1.20E-04	88	550669	4162479.51
89	550689	4162479.51	REC	4.20E-04	5.60E-04	1.45E-07	5.85E-07	3.60E-09	7.24E-08	7.6E-08	0.075991429	1.12E-04	89	550689	4162479.51
90	550709	4162479.51	REC	3.90E-04	5.30E-04	1.35E-07	5.54E-07	3.34E-09	6.85E-08	7.2E-08	0.071856203	1.06E-04	90	550709	4162479.51
91	550729	4162479.51	REC	3.80E-04	5.10E-04	1.32E-07	5.33E-07	3.26E-09	6.59E-08	6.9E-08	0.069185061	1.02E-04	91	550729	4162479.51
92	550749	4162479.51	REC	3.70E-04	5.00E-04	1.28E-07	5.23E-07	3.17E-09	6.46E-08	6.8E-08	0.067806653	1.00E-04	92	550749	4162479.51
93	550769	4162479.51	REC	3.70E-04	5.00E-04	1.28E-07	5.23E-07	3.17E-09	6.46E-08	6.8E-08	0.067806653	1.00E-04	93	550769	4162479.51
94	550789	4162479.51	REC	3.80E-04	5.10E-04	1.32E-07	5.33E-07	3.26E-09	6.59E-08	6.9E-08	0.069185061	1.02E-04	94	550789	4162479.51
95	550809	4162479.51	REC	3.90E-04	5.30E-04	1.35E-07	5.54E-07	3.34E-09	6.85E-08	7.2E-08	0.071856203	1.06E-04	95	550809	4162479.51
96	550829	4162479.51	REC	4.00E-04	5.40E-04	1.38E-07	5.64E-07	3.43E-09	6.98E-08	7.3E-08	0.073234612	1.08E-04	96	550829	4162479.51
97	550849	4162479.51	REC	4.00E-04	5.50E-04	1.38E-07	5.75E-07	3.43E-09	7.11E-08	7.5E-08	0.074527345	1.10E-04	97	550849	4162479.51
98	550869	4162479.51	REC	4.00E-04	5.60E-04	1.38E-07	5.85E-07	3.43E-09	7.24E-08	7.6E-08	0.075820078	1.12E-04	98	550869	4162479.51
99	550889	4162479.51	REC	4.00E-04	5.60E-04	1.38E-07	5.85E-07	3.43E-09	7.24E-08	7.6E-08	0.075820078	1.12E-04	99	550889	4162479.51
100	550909	4162479.51	REC	4.00E-04	5.60E-04	1.38E-07	5.85E-07	3.43E-09	7.24E-08	7.6E-08	0.075820078	1.12E-04	100	550909	4162479.51
101	550929	4162479.51	REC	3.90E-04	5.50E-04	1.35E-07	5.75E-07	3.34E-09	7.11E-08	7.4E-08	0.074441669	1.10E-04	101	550929	4162479.51
102	550949	4162479.51	REC	3.80E-04	5.30E-04	1.32E-07	5.54E-07	3.26E-09	6.85E-08	7.2E-08	0.071770527	1.06E-04	102	550949	4162479.51
103	550969	4162479.51	REC	3.70E-04	5.10E-04	1.28E-07	5.33E-07	3.17E-09	6.59E-08	6.9E-08	0.069099386	1.02E-04	103	550969	4162479.51
104	550989	4162479.51	REC	3.60E-04	5.10E-04	1.25E-07	5.33E-07	3.08E-09	6.59E-08	6.9E-08	0.06901371	1.02E-04	104	550989	4162479.51
105	551009	4162479.51	REC	3.60E-04	5.10E-04	1.25E-07	5.33E-07	3.08E-09	6.59E-08	6.9E-08	0.06901371	1.02E-04	105	551009	4162479.51
106	551029	4162479.51	REC	3.70E-04	5.20E-04	1.28E-07	5.44E-07	3.17E-09	6.72E-08	7.0E-08	0.070392119	1.04E-04	106	551029	4162479.51
107	551049	4162479.51	REC	3.80E-04	5.40E-04	1.32E-07	5.64E-07	3.26E-09	6.98E-08	7.3E-08	0.07306326	1.08E-04	107	551049	4162479.51
108	551069	4162479.51	REC	4.00E-04	5.60E-04	1.38E-07	5.85E-07	3.43E-09	7.24E-08	7.6E-08	0.075820078	1.12E-04	108	551069	4162479.51
109	551089	4162479.51	REC	4.10E-04	5.80E-04	1.42E-07	6.06E-07	5.58E-09	1.19E-07	1.2E-07	0.124589238	1.16E-04	109	551089	4162479.51
110	551109	4162479.51	REC	4.10E-04	5.70E-04	1.42E-07	5.96E-07	5.58E-09	1.17E-07	1.2E-07	0.12253728	1.14E-04	110	551109	4162479.51
111	550209	4162499.51	RES	1.00E-03	1.42E-03	3.46E-07	1.48E-06	1.36E-08	2.91E-07	3.0E-07	0.30497724	2.84E-04	111	550209	4162499.51
112	550229	4162499.51	RES	1.05E-03	1.48E-03	3.63E-07	1.55E-06	1.43E-08	3.04E-07	3.2E-07	0.317968949	2.96E-04	112	550229	4162499.51
113	550269	4162499.51	RES	1.12E-03	1.58E-03	3.88E-07	1.65E-06	1.52E-08	3.24E-07	3.4E-07	0.339440473	3.16E-04	113	550269	4162499.51
114	550289	4162499.51	RES	1.16E-03	1.63E-03	4.02E-07	1.70E-06	1.58E-08	3.34E-07	3.5E-07	0.350244232	3.26E-04	114	550289	4162499.51
115	550309	4162499.51	RES	1.17E-03	1.65E-03	4.05E-07	1.72E-06	1.59E-08	3.39E-07	3.5E-07	0.354484139	3.30E-04	115	550309	4162499.51
116	550329	4162499.51	RES	1.18E-03	1.66E-03	4.08E-07	1.74E-06	1.60E-08	3.41E-07	3.6E-07	0.35667209	3.32E-04	116	550329	4162499.51
117	550349	4162499.51	RES	1.18E-03	1.66E-03	4.08E-07	1.74E-06	1.60E-08	3.41E-07	3.6E-07	0.35667209	3.32E-04	117	550349	4162499.51
118	550369	4162499.51	RES	1.15E-03	1.62E-03	3.98E-07	1.69E-06	1.56E-08	3.32E-07	3.5E-07	0.348056281	3.24E-04	118	550369	4162499.51
119	550389	4162499.51	RES	1.11E-03	1.55E-03	3.84E-07	1.62E-06	1.51E-08	3.18E-07	3.3E-07	0.333148608	3.10E-04	119	550389	4162499.51
120	550569	4162499.51	RES	8.00E-04	9.90E-04	2.77E-07	1.03E-06	1.09E-08	2.03E-07	2.1E-07	0.214023216	1.98E-04	120	550569	4162499.51
121	550589	4162499.51	RES	7.10E-04	9.00E-04	2.46E-07	9.41E-07	9.66E-09	1.85E-07	1.9E-07	0.194331663	1.80E-04	121	550589	4162499.51

Max				
Rec	X	Y	Cancer Risk	Chronic Hazard
659	550329	4162800	2.705	0.003

Age Bin by Receptor				
Age Bin	REC	RES	WOR	SCH
A	3rd trimester	3rd trimester	16<30	0<2
B	0<2	0<2	16-70	2<9

8.78E-03	1.26E-02

122	550609	4162499.51	RES	6.50E-04	8.30E-04	2.25E-07	8.68E-07	8.84E-09	1.70E-07	1.8E-07	0.179152004	1.66E-04	122	550609	4162499.51
123	550629	4162499.51	RES	5.90E-04	7.70E-04	2.04E-07	8.05E-07	8.02E-09	1.58E-07	1.7E-07	0.166024301	1.54E-04	123	550629	4162499.51
124	550669	4162499.51	REC	4.80E-04	6.40E-04	1.66E-07	6.69E-07	4.11E-09	8.27E-08	8.7E-08	0.086847348	1.28E-04	124	550669	4162499.51
125	550689	4162499.51	REC	4.50E-04	5.90E-04	1.56E-07	6.17E-07	3.86E-09	7.63E-08	8.0E-08	0.080126656	1.18E-04	125	550689	4162499.51
126	550709	4162499.51	REC	4.20E-04	5.60E-04	1.45E-07	5.85E-07	3.60E-09	7.24E-08	7.6E-08	0.075991429	1.12E-04	126	550709	4162499.51
127	550729	4162499.51	REC	4.10E-04	5.50E-04	1.42E-07	5.75E-07	3.51E-09	7.11E-08	7.5E-08	0.074613021	1.10E-04	127	550729	4162499.51
128	550749	4162499.51	REC	4.00E-04	5.40E-04	1.38E-07	5.64E-07	3.43E-09	6.98E-08	7.3E-08	0.073234612	1.08E-04	128	550749	4162499.51
129	550769	4162499.51	REC	4.10E-04	5.50E-04	1.42E-07	5.75E-07	3.51E-09	7.11E-08	7.5E-08	0.074613021	1.10E-04	129	550769	4162499.51
130	550789	4162499.51	REC	4.20E-04	5.60E-04	1.45E-07	5.85E-07	3.60E-09	7.24E-08	7.6E-08	0.075991429	1.12E-04	130	550789	4162499.51
131	550809	4162499.51	REC	4.30E-04	5.80E-04	1.49E-07	6.06E-07	3.68E-09	7.50E-08	7.9E-08	0.078662571	1.16E-04	131	550809	4162499.51
132	550829	4162499.51	REC	4.40E-04	6.00E-04	1.52E-07	6.27E-07	3.77E-09	7.76E-08	8.1E-08	0.081333713	1.20E-04	132	550829	4162499.51
133	550849	4162499.51	REC	4.50E-04	6.20E-04	1.56E-07	6.48E-07	3.86E-09	8.01E-08	8.4E-08	0.084004855	1.24E-04	133	550849	4162499.51
134	550869	4162499.51	REC	4.50E-04	6.20E-04	1.56E-07	6.48E-07	3.86E-09	8.01E-08	8.4E-08	0.084004855	1.24E-04	134	550869	4162499.51
135	550889	4162499.51	REC	4.40E-04	6.10E-04	1.52E-07	6.38E-07	3.77E-09	7.89E-08	8.3E-08	0.082626446	1.22E-04	135	550889	4162499.51
136	550909	4162499.51	REC	4.30E-04	6.00E-04	1.49E-07	6.27E-07	3.68E-09	7.76E-08	8.1E-08	0.081248037	1.20E-04	136	550909	4162499.51
137	550929	4162499.51	REC	4.20E-04	5.90E-04	1.45E-07	6.17E-07	3.60E-09	7.63E-08	8.0E-08	0.079869628	1.18E-04	137	550929	4162499.51
138	550949	4162499.51	REC	4.10E-04	5.70E-04	1.42E-07	5.96E-07	3.51E-09	7.37E-08	7.7E-08	0.077198487	1.14E-04	138	550949	4162499.51
139	550969	4162499.51	REC	4.00E-04	5.60E-04	1.38E-07	5.85E-07	3.43E-09	7.24E-08	7.6E-08	0.075820078	1.12E-04	139	550969	4162499.51
140	550989	4162499.51	REC	4.00E-04	5.60E-04	1.38E-07	5.85E-07	3.43E-09	7.24E-08	7.6E-08	0.075820078	1.12E-04	140	550989	4162499.51
141	551009	4162499.51	REC	4.00E-04	5.60E-04	1.38E-07	5.85E-07	3.43E-09	7.24E-08	7.6E-08	0.075820078	1.12E-04	141	551009	4162499.51
142	551029	4162499.51	REC	4.10E-04	5.70E-04	1.42E-07	5.96E-07	3.51E-09	7.37E-08	7.7E-08	0.077198487	1.14E-04	142	551029	4162499.51
143	551049	4162499.51	REC	4.10E-04	5.80E-04	1.42E-07	6.06E-07	3.51E-09	7.50E-08	7.8E-08	0.07849122	1.16E-04	143	551049	4162499.51
144	551069	4162499.51	REC	4.30E-04	6.00E-04	1.49E-07	6.27E-07	3.68E-09	7.76E-08	8.1E-08	0.081248037	1.20E-04	144	551069	4162499.51
145	551089	4162499.51	REC	4.50E-04	6.30E-04	1.56E-07	6.58E-07	3.86E-09	8.14E-08	8.5E-08	0.085297588	1.26E-04	145	551089	4162499.51
146	551109	4162499.51	REC	4.50E-04	6.30E-04	1.56E-07	6.58E-07	3.86E-09	8.14E-08	8.5E-08	0.085297588	1.26E-04	146	551109	4162499.51
147	550189	4162519.51	RES	1.00E-03	1.42E-03	3.46E-07	1.48E-06	1.36E-08	2.91E-07	3.0E-07	0.30497724	2.84E-04	147	550189	4162519.51
148	550209	4162519.51	RES	1.06E-03	1.49E-03	3.67E-07	1.56E-06	1.44E-08	3.06E-07	3.2E-07	0.320156899	2.98E-04	148	550209	4162519.51
149	550249	4162519.51	RES	1.15E-03	1.63E-03	3.98E-07	1.70E-06	1.56E-08	3.34E-07	3.5E-07	0.350108238	3.26E-04	149	550249	4162519.51
150	550269	4162519.51	RES	1.21E-03	1.70E-03	4.19E-07	1.78E-06	1.65E-08	3.49E-07	3.7E-07	0.365287898	3.40E-04	150	550269	4162519.51
151	550289	4162519.51	RES	1.25E-03	1.77E-03	4.33E-07	1.85E-06	1.70E-08	3.63E-07	3.8E-07	0.380195571	3.54E-04	151	550289	4162519.51
152	550309	4162519.51	RES	1.29E-03	1.82E-03	4.47E-07	1.90E-06	1.75E-08	3.73E-07	3.9E-07	0.39099933	3.64E-04	152	550309	4162519.51
153	550329	4162519.51	RES	1.30E-03	1.83E-03	4.50E-07	1.91E-06	1.77E-08	3.76E-07	3.9E-07	0.39318728	3.66E-04	153	550329	4162519.51
154	550349	4162519.51	RES	1.29E-03	1.82E-03	4.47E-07	1.90E-06	1.75E-08	3.73E-07	3.9E-07	0.39099933	3.64E-04	154	550349	4162519.51
155	550369	4162519.51	RES	1.27E-03	1.78E-03	4.40E-07	1.86E-06	1.73E-08	3.65E-07	3.8E-07	0.382519514	3.56E-04	155	550369	4162519.51
156	550389	4162519.51	RES	1.26E-03	1.75E-03	4.36E-07	1.83E-06	1.71E-08	3.59E-07	3.8E-07	0.37622765	3.50E-04	156	550389	4162519.51
157	550569	4162519.51	RES	8.60E-04	1.06E-03	2.98E-07	1.11E-06	1.17E-08	2.18E-07	2.3E-07	0.229202876	2.12E-04	157	550569	4162519.51
158	550589	4162519.51	RES	7.60E-04	9.60E-04	2.63E-07	1.00E-06	1.03E-08	1.97E-07	2.1E-07	0.207323372	1.92E-04	158	550589	4162519.51
159	550609	4162519.51	RES	6.80E-04	8.70E-04	2.35E-07	9.09E-07	9.25E-09	1.79E-07	1.9E-07	0.187767812	1.74E-04	159	550609	4162519.51
160	550649	4162519.51	REC	5.60E-04	7.40E-04	1.94E-07	7.73E-07	4.80E-09	9.57E-08	1.0E-07	0.100460084	1.48E-04	160	550649	4162519.51
161	550669	4162519.51	REC	5.00E-04	6.70E-04	1.73E-07	7.00E-07	4.28E-09	8.66E-08	9.1E-08	0.090896898	1.34E-04	161	550669	4162519.51
162	550689	4162519.51	REC	4.70E-04	6.30E-04	1.63E-07	6.58E-07	4.03E-09	8.14E-08	8.5E-08	0.085468939	1.26E-04	162	550689	4162519.51
163	550709	4162519.51	REC	4.50E-04	6.10E-04	1.56E-07	6.38E-07	3.86E-09	7.89E-08	8.3E-08	0.082712122	1.22E-04	163	550709	4162519.51
164	550729	4162519.51	REC	4.40E-04	6.00E-04	1.52E-07	6.27E-07	3.77E-09	7.76E-08	8.1E-08	0.081333713	1.20E-04	164	550729	4162519.51
165	550749	4162519.51	REC	4.40E-04	6.00E-04	1.52E-07	6.27E-07	3.77E-09	7.76E-08	8.1E-08	0.081333713	1.20E-04	165	550749	4162519.51
166	550769	4162519.51	REC	4.50E-04	6.10E-04	1.56E-07	6.38E-07	3.86E-09	7.89E-08	8.3E-08	0.082712122	1.22E-04	166	550769	4162519.51
167	550789	4162519.51	REC	4.60E-04	6.30E-04	1.59E-07	6.58E-07	3.94E-09	8.14E-08	8.5E-08	0.085383263	1.26E-04	167	550789	4162519.51
168	550809	4162519.51	REC	4.80E-04	6.60E-04	1.66E-07	6.90E-07	4.11E-09	8.53E-08	8.9E-08	0.089432814	1.32E-04	168	550809	4162519.51
169	550829	4162519.51	REC	4.90E-04	6.80E-04	1.70E-07	7.11E-07	4.20E-09	8.79E-08	9.2E-08	0.092103956	1.36E-04	169	550829	4162519.51
170	550849	4162519.51	REC	5.00E-04	6.90E-04	1.73E-07	7.21E-07	4.28E-09	8.92E-08	9.3E-08	0.093482364	1.38E-04	170	550849	4162519.51
171	550869	4162519.51	REC	4.90E-04	6.80E-04	1.70E-07	7.11E-07	4.20E-09	8.79E-08	9.2E-08	0.092103956	1.36E-04	171	550869	4162519.51
172	550889	4162519.51	REC	4.70E-04	6.60E-04	1.63E-07	6.90E-07	4.03E-09	8.53E-08	8.9E-08	0.089347138	1.32E-04	172	550889	4162519.51
173	550909	4162519.51	REC	4.60E-04	6.50E-04	1.59E-07	6.79E-07	3.94E-09	8.40E-08	8.8E-08	0.087968729	1.30E-04	173	550909	4162519.51
174	550929	4162519.51	REC	4.60E-04	6.40E-04	1.59E-07	6.69E-07	3.94E-09	8.27E-08	8.7E-08	0.086675996	1.28E-04	174	550929	4162519.51
175	550949	4162519.51	REC	4.50E-04	6.30E-04	1.56E-07	6.58E-07	3.86E-09	8.14E-08	8.5E-08	0.085297588	1.26E-04	175	550949	4162519.51
176	550969	4162519.51	REC	4.40E-04	6.20E-04	1.52E-07	6.48E-07	3.77E-09	8.01E-08	8.4E-08	0.083919179	1.24E-04	176	550969	4162519.51
177	550989	4162519.51	REC	4.40E-04	6.20E-04	1.52E-07	6.48E-07	3.77E-09	8.01E-08	8.4E-08	0.083919179	1.24E-04	177	550989	4162519.51
178	551009	4162519.51	REC	4.40E-04	6.20E-04	1.52E-07	6.48E-07	3.77E-09	8.01E-08	8.4E-08	0.083919179	1.24E-04	178	551009	4162519.51
179	551029	4162519.51	REC	4.50E-04	6.30E-04	1.56E-07	6.58E-07	3.86E-09	8.14E-08	8.5E-08	0.085297588	1.26E-04	179	551029	4162519.51
180	551049	4162519.51	REC	4.60E-04	6.40E-04	1.59E-07	6.69E-07	3.94E-09	8.27E-08	8.7E-08	0.086675996	1.28E-04	180	551049	4162519.51
181	551069	4162519.51	REC	4.70E-04	6.50E-04	1.63E-07	6.79E-07	4.03E-09	8.40E-08	8.8E-08	0.088054405	1.30E-04	181	551069	4162519.51
182	551089	4162519.51	REC	4.80E-04	6.80E-04	1.66E-07	7.11E-07	4.11E-09	8.79E-08	9.2E-08	0.09201828	1.36E-04	182	551089	4162519.51
183	551109	4162519.51	REC	4.80E-04	6.80E-04	1.66E-07	7.11E-07	4.11E-09	8.79E-08	9.2E-08	0.09201828	1.36E-04	183	551109	4162519.51
184	550169	4162539.51	RES	9.90E-04	1.40E-03	3.43E-07	1.46E-06	1.35E-08	2.87E-07	3.0E-07	0.300737332	2.80E-04	184	550169	4162539.51
185	550189	4162539.51	RES	1.05E-03	1.49E-03	3.63E-07	1.56E-06	1.43E-08	3.06E-07	3.2E-07	0.320020906	2.98E-04	185	550189	4162539.51
186	550229	4162539.51	RES	1.17E-03	1.66E-03	4.05E-07	1.74E-06	1.59E-08	3.41E-07	3.6E-07	0.356536096	3.32E-04	186	550229	4162539.51
187	550249	4162539.51	RES	1.23E-03	1.74E-03	4.26E-07	1.82E-06	1.67E-08	3.57E-07	3.7E-07	0.373767713	3.48E-04	187	550249	4162539.51
188	550269	4162539.51	RES	1.29E-03	1.82E-03	4.47E-07	1.90E-06	1.75E-08	3.73E-07	3.9E-07	0.39099933	3.64E-04	188	550269	4162539.51
189	550289	4162539.51	RES	1.36E-03	1.93E-03	4.71E-07	2.02E-06	1.85E-08	3.96E-07	4.1E-07	0.414522811	3.86E-04	189	550289	4162539.51
190	550309	4162539.51	RES	1.41E-03	1.99E-03	4.88E-07	2.08E-06	1.92E-08	4.08E-07	4.3E-07	0.42751452	3.98E-04	190	550309	4162539.51
191	550349	4162539.51	RES	1.43E-03	2.02E-03	4.95E-07	2.11E-06	1.94E-08	4.14E-07	4.3E-07	0.433942378	4.04E-04	191	550349	4162539.51
192	550369	4162539.51	RES	1.41E-03	1.98E-03	4.88E-07	2.07E-06	1.92E-08	4.06E-07	4.3E-07	0.425462563	3.96E-04	192	550369	4162539.51
193	550389	4162539.51	RES	1.42E-03	1.99E-03	4.92E-07	2.08E-06	1.93E-08	4.08E-07	4.3E-07	0.427650513	3.98E-04	193	550389	4162539.51
194	550649	4162539.51	REC	5.90E-04	7.70E-04	2.04E-07	8.05E-07	5.05E-09	9.95E-08	1.0E-07	0.10459531	1.54E-04	194	550649	4162539.51
195	550669	4162539.51	REC	5.40E-04	7.10E-04	1.87E-07	7.42E-07	4.63E-09	9.18E-08	9.6E-08	0.096410533	1.42E-04	195	550669	4162539.51
196	550689	4162539.51	REC	5.10E-04	6.80E-04	1.77E-07	7.11E-07	4.37E-09	8.79E-08	9.2E-08	0.092275307	1.36E-04	196	550689	4162539.51
197	550709	4162539.51	REC	4.90E-04	6.60E-04	1.70E-07	6.90E-07	4.20E-09	8.53E-08	9.0E-08	0.08951849	1.32E-04	197	550709	4162539.51
198	550729	4162539.51	REC	4.80E-04	6.50E-04	1.66E-07	6.79E-07	4.11E-09	8.40E-08	8.8E-08	0.088140081	1.30E-04	198	550729	4162539.51
199	550749	4162539.51	REC	4.90E-04	6.60E-04	1.70E-07	6.90E-07	4.20E-09	8.53E-08	9.0E-08	0.08951849	1.32E-04	199	550749	4162539.51
200	550769	4162539.51	REC	5.00E-04	6.80E-04	1.73E-07	7.11E-07	4.28E-09	8.79E-08	9.2E-08	0.092189631	1.36E-04	200	550769	4162539.51
201	550789	4162539.51	REC	5.20E-04	7.10E-04	1.80E-07	7.42E-07	4.46E-09	9.18E-08	9.6E-08	0.096239182	1.42E-04	201	550789	4162539.51
202	550809	4162539.51	REC	5.40E-04	7.40E-04	1.87E-07	7.73E-07	4.63E-09	9.57E-08	1.0E-07	0.100288732	1.48E-04	202	550809	4162539.51
203	550829	4162539.51	REC	5.60E-04	7.70E-04	1.94E-07	8.05E-07	4.80E-09	9.95E-08	1.0E-07	0.104338283	1.54E-04	203	550829	4162539.51
204	550849	4162539.51	REC	5.60E-04	7.80E-04	1.94E-07	8.15E-07	4.80E-09	1.01E-07	1.1E-07	0.105631016	1.56E-04	204	550849	4162539.51
205	550869	4162539.51	REC	5.50E-04	7.70E-04	1.90E-07	8.05E-07	4.71E-09	9.95E-08	1.0E-07	0.104252607	1.54E-04	205	550869	4162539.51
206	550889	4162539.51	REC	5.30E-04	7.30E-04	1.83E-07	7.63E-07	4.54E-09	9.44E-08	9.9E-08	0.098910324	1.46E-04	206	550889	4162539.51
207	550909	4162539.51	REC	5.10E-04	7.10E-04	1.77E-07	7.42E-07	4.37E-09	9.18E-08	9.6E-08	0.096153506	1.42E-04	207	550909	4162539.51
208	550929	4162539.51	REC	5.00E-04	7.00E-04	1.73E-07	7.32E-07	4.28E-09	9.05E-08	9.5E-08	0.094775097	1.40E-04	208	550929	4162539.51
209	550949	4162539.51	REC	5.00E-04	7.00E-04	1.73E-07	7.32E-07	4.28E-09	9.05E-08	9.5E-08	0.094775097	1.40E-04	209	550949	4162539.51
210	550969	4162539.51	REC	4.90E-04	6.90E-04	1.70E-07	7.21E-07	4.20E-09	8.92E-08	9.3E-08	0.093396689	1.38E-04	210	550969	4162539.51
211	550989	4162539.51	REC	4.90E-04	6.90E-04	1.70E-07	7.21E-07	4.20E-09	8.92E-08	9.3E-08	0.093396689	1.38E-04	211	550989	4162539.51
212	551009	4162539.51	REC	4.90E-04	6.90E-04	1.70E-07	7.21E-07	4.20E-09	8.92E-08	9.3E-08	0.093396689	1.38E-04	212	551009	4162539.51
213	551029	4162539.51	REC	5.00E-04	7.00E-04	1.73E-07	7.32E-07	4.28E-09	9.05E-08	9.5E-08	0.094775097	1.40E-04	213	551029	4162539.51
214	551049	4162539.51	REC	5.00E-04	7.00E-04	1.73E-07	7.32E-07	4.28E-09	9.05E-08	9.5E-08	0.094775097	1.40E-04	214	551049	4162539.51
215	551069	4162539.51	REC	5.10E-04	7.20E-04	1.77E-07	7.53E-07	4.37E-09	9.31E-08	9.7E-08	0.097446239	1.44E-04	215	551069	4162539.51
216	551089	4162539.51	REC	5.20E-04	7.30E-04	1.80E-07	7.63E-07	4.46E-09	9.44E-08	9.9E-08	0.098824648	1.46E-04	216	551089	4162539.51
217	551109	4162539.51	REC	5.20E-04	7.40E-04	1.80E-07	7.73E-07	4.46E-09	9.57E-08	1.0E-07	0.100117381	1.48E-04	217	551109	4162539.51
218	550149	4162559.51	RES	9.70E-04	1.37E-03	3.36E-07	1.43E-06	1.32E-08	2.81E-07	2.9E-07	0.294309474	2.74E-04	218	550149	4162559.51
219	550169	4162559.51	RES	1.03E-03	1.46E-03	3.57E-07	1.53E-06	1.40E-08	3.00E-07	3.1E-07	0.313593048	2.92E-04	219	550169	4162559.51
220	550209	4162559.51	RES	1.17E-03	1.66E-03	4.05E-07	1.74E-06	1.59E-08	3.41E-07	3.6E-07	0.356536096	3.32E-04	220	550209	4162559.51
221	550229	4162559.51	RES	1.24E-03	1.76E-03	4.29E-07	1.84E-06	1.69E-08	3.61E-07	3.8E-07	0.378007621	3.52E-04	221	550229	4162559.51
222	550249	4162559.51	RES	1.31E-03	1.86E-03	4.53E-07	1.94E-06	1.78E-08	3.82E-07	4.0E-07	0.399479145	3.72E-04	222	550249	4162559.51
223	550269	4162559.51	RES	1.39E-03	1.96E-03	4.81E-07	2.05E-06	1.89E-08	4.02E-07	4.2E-07	0.421086662	3.92E-04	223	550269	4162559.51
224	550289	4162559.51	RES	1.45E-03	2.06E-03	5.02E-07	2.15E-06	1.97E-08	4.23E-07	4.4E-07	0.442422193	4.12E-04	224	550289	4162559.51
225	550309	4162559.51	RES	1.55E-03	2.19E-03	5.37E-07	2.29E-06	2.11E-08	4.49E-07	4.7E-07	0.470457568	4.38E-04	225	550309	4162559.51
226	550329	4162559.51	RES	1.59E-03	2.25E-03	5.50E-07	2.35E-06	2.16E-08	4.62E-07	4.8E-07	0.483313284	4.50E-04	226	550329	4162559.51
227	550349	4162559.51	RES	1.61E-03	2.27E-03	5.57E-07	2.37E-06	2.19E-08	4.66E-07	4.9E-07	0.487689185	4.54E-04	227	550349	4162559.51
228	550369	4162559.51	RES	1.58E-03	2.23E-03	5.47E-07	2.33E-06	2.15E-08	4.58E-07	4.8E-07	0.479073377	4.46E-04	228	550369	4162559.51
229	550389	4162559.51	RES	1.57E-03	2.21E-03	5.43E-07	2.31E-06	2.14E-08	4.53E-07	4.7E-07	0.474833469	4.42E-04	229	550389	4162559.51
230	550629	4162559.51	REC	6.80E-04	8.90E-04	2.35E-07	9.30E-07	5.83E-09	1.15E-07	1.2E-07	0.120879188	1.78E-04	230	550629	4162559.51
231	550649	4162559.51	REC	6.30E-04	8.30E-04	2.18E-07	8.68E-07	5.40E-09	1.07E-07	1.1E-07	0.112694411	1.66E-04	231	550649	4162559.51
232	550669	4162559.51	REC	5.80E-04	7.70E-04	2.01E-07	8.05E-07	4.97E-09	9.95E-08	1.0E-07	0.104509634	1.54E-04	232	550669	4162559.51
233	550689	4162559.51	REC	5.60E-04	7.50E-04	1.94E-07	7.84E-07	4.80E-09	9.70E-08	1.0E-07	0.101752817	1.50E-04	233	550689	4162559.51
234	550709	4162559.51	REC	5.40E-04	7.30E-04	1.87E-07	7.63E-07	4.63E-09	9.44E-08	9.9E-08	0.098995999	1.46E-04	234	550709	4162559.51
235	550729	4162559.51	REC	5.40E-04	7.30E-04	1.87E-07	7.63E-07	4.63E-09	9.44E-08	9.9E-08	0.098995999	1.46E-04	235	550729	4162559.51
236	550749	4162559.51	REC	5.40E-04	7.30E-04	1.87E-07	7.63E-07	4.63E-09	9.44E-08	9.9E-08	0.098995999	1.46E-04	236	550749	4162559.51
237	550769	4162559.51	REC	5.50E-04	7.50E-04	1.90E-07	7.84E-07	4.71E-09	9.70E-08	1.0E-07	0.101667141	1.50E-04	237	550769	4162559.51
238	550789	4162559.51	REC	5.80E-04	7.90E-04	2.01E-07	8.26E-07	4.97E-09	1.02E-07	1.1E-07	0.1070951	1.58E-04	238	550789	4162559.51
239	550809	4162559.51	REC	6.00E-04	8.30E-04	2.08E-07	8.68E-07	5.14E-09	1.07E-07	1.1E-07	0.112437384	1.66E-04	239	550809	4162559.51
240	550829	4162559.51	REC	6.20E-04	8.50E-04	2.15E-07	8.88E-07	5.31E-09	1.10E-07	1.2E-07	0.115194201	1.70E-04	240	550829	4162559.51
241	550849	4162559.51	REC	6.30E-04	8.70E-04	2.18E-07	9.09E-07	5.40E-09	1.12E-07	1.2E-07	0.117865343	1.74E-04	241	550849	4162559.51
242	550869	4162559.51	REC	6.30E-04	8.80E-04	2.18E-07	9.20E-07	5.40E-09	1.14E-07	1.2E-07	0.119158076	1.76E-04	242	550869	4162559.51
243	550889	4162559.51	REC	6.00E-04	8.40E-04	2.08E-07	8.78E-07	5.14E-09	1.09E-07	1.1E-07	0.113730117	1.68E-04	243	550889	4162559.51
244	550909	4162559.51	REC	5.70E-04	8.00E-04	1.97E-07	8.36E-07	4.88E-09	1.03E-07	1.1E-07	0.108302158	1.60E-04	244	550909	4162559.51
245	550929	4162559.51	REC	5.60E-04	7.90E-04	1.94E-07	8.26E-07	4.80E-09	1.02E-07	1.1E-07	0.106923749	1.58E-04	245	550929	4162559.51
246	550949	4162559.51	REC	5.60E-04	7.80E-04	1.94E-07	8.15E-07	4.80E-09	1.01E-07	1.1E-07	0.105631016	1.56E-04	246	550949	4162559.51
247	550969	4162559.51	REC	5.60E-04	7.80E-04	1.94E-07	8.15E-07	4.80E-09	1.01E-07	1.1E-07	0.105631016	1.56E-04	247	550969	4162559.51
248	550989	4162559.51	REC	5.60E-04	7.80E-04	1.94E-07	8.15E-07	4.80E-09	1.01E-07	1.1E-07	0.105631016	1.56E-04	248	550989	4162559.51
249	551009	4162559.51	REC	5.50E-04	7.80E-04	1.90E-07	8.15E-07	4.71E-09	1.01E-07	1.1E-07	0.10554534	1.56E-04	249	551009	4162559.51

250	551029	4162559.51	REC	5.50E-04	7.70E-04	1.90E-07	8.05E-07	4.71E-09	9.95E-08	1.0E-07	0.104252607	1.54E-04	250	551029	4162559.51
251	551049	4162559.51	REC	5.50E-04	7.70E-04	1.90E-07	8.05E-07	4.71E-09	9.95E-08	1.0E-07	0.104252607	1.54E-04	251	551049	4162559.51
252	551069	4162559.51	REC	5.60E-04	7.80E-04	1.94E-07	8.15E-07	4.80E-09	1.01E-07	1.1E-07	0.105631016	1.56E-04	252	551069	4162559.51
253	551089	4162559.51	REC	5.70E-04	8.00E-04	1.97E-07	8.36E-07	4.88E-09	1.03E-07	1.1E-07	0.108302158	1.60E-04	253	551089	4162559.51
254	551109	4162559.51	REC	5.60E-04	8.00E-04	1.94E-07	8.36E-07	4.80E-09	1.03E-07	1.1E-07	0.108216482	1.60E-04	254	551109	4162559.51
255	550129	4162579.51	RES	9.40E-04	1.32E-03	3.25E-07	1.38E-06	1.28E-08	2.71E-07	2.8E-07	0.283641709	2.64E-04	255	550129	4162579.51
256	550149	4162579.51	RES	1.01E-03	1.42E-03	3.50E-07	1.48E-06	1.37E-08	2.91E-07	3.1E-07	0.305113233	2.84E-04	256	550149	4162579.51
257	550169	4162579.51	RES	1.08E-03	1.52E-03	3.74E-07	1.59E-06	1.47E-08	3.12E-07	3.3E-07	0.326584757	3.04E-04	257	550169	4162579.51
258	550189	4162579.51	RES	1.15E-03	1.63E-03	3.98E-07	1.70E-06	1.56E-08	3.34E-07	3.5E-07	0.350108238	3.26E-04	258	550189	4162579.51
259	550209	4162579.51	RES	1.23E-03	1.74E-03	4.26E-07	1.82E-06	1.67E-08	3.57E-07	3.7E-07	0.373767713	3.48E-04	259	550209	4162579.51
260	550229	4162579.51	RES	1.32E-03	1.87E-03	4.57E-07	1.95E-06	1.80E-08	3.84E-07	4.0E-07	0.401667095	3.74E-04	260	550229	4162579.51
261	550269	4162579.51	RES	1.51E-03	2.13E-03	5.23E-07	2.23E-06	2.05E-08	4.37E-07	4.6E-07	0.457601853	4.26E-04	261	550269	4162579.51
262	550289	4162579.51	RES	1.59E-03	2.26E-03	5.50E-07	2.36E-06	2.16E-08	4.64E-07	4.9E-07	0.485365242	4.52E-04	262	550289	4162579.51
263	550309	4162579.51	RES	1.68E-03	2.38E-03	5.82E-07	2.49E-06	2.28E-08	4.88E-07	5.1E-07	0.511212667	4.76E-04	263	550309	4162579.51
264	550329	4162579.51	RES	1.77E-03	2.50E-03	6.13E-07	2.61E-06	2.41E-08	5.13E-07	5.4E-07	0.537060091	5.00E-04	264	550329	4162579.51
265	550349	4162579.51	RES	1.81E-03	2.55E-03	6.27E-07	2.67E-06	2.46E-08	5.23E-07	5.5E-07	0.54786385	5.10E-04	265	550349	4162579.51
266	550369	4162579.51	RES	1.78E-03	2.52E-03	6.16E-07	2.63E-06	2.42E-08	5.17E-07	5.4E-07	0.541299999	5.04E-04	266	550369	4162579.51
267	550389	4162579.51	RES	1.74E-03	2.44E-03	6.02E-07	2.55E-06	2.37E-08	5.01E-07	5.2E-07	0.524340369	4.88E-04	267	550389	4162579.51
268	550409	4162579.51	RES	1.82E-03	2.56E-03	6.30E-07	2.68E-06	2.48E-08	5.25E-07	5.5E-07	0.550051801	5.12E-04	268	550409	4162579.51
269	550609	4162579.51	REC	7.90E-04	1.03E-03	2.73E-07	1.08E-06	6.77E-09	1.33E-07	1.4E-07	0.139919883	2.06E-04	269	550609	4162579.51
270	550629	4162579.51	REC	7.30E-04	9.50E-04	2.53E-07	9.93E-07	6.25E-09	1.23E-07	1.3E-07	0.129063964	1.90E-04	270	550629	4162579.51
271	550649	4162579.51	REC	6.80E-04	9.00E-04	2.35E-07	9.41E-07	5.83E-09	1.16E-07	1.2E-07	0.122171921	1.80E-04	271	550649	4162579.51
272	550669	4162579.51	REC	6.40E-04	8.50E-04	2.22E-07	8.88E-07	5.48E-09	1.10E-07	1.2E-07	0.115365553	1.70E-04	272	550669	4162579.51
273	550689	4162579.51	REC	6.20E-04	8.30E-04	2.15E-07	8.68E-07	5.31E-09	1.07E-07	1.1E-07	0.112608735	1.66E-04	273	550689	4162579.51
274	550709	4162579.51	REC	6.00E-04	8.20E-04	2.08E-07	8.57E-07	5.14E-09	1.06E-07	1.1E-07	0.111144651	1.64E-04	274	550709	4162579.51
275	550729	4162579.51	REC	6.00E-04	8.20E-04	2.08E-07	8.57E-07	5.14E-09	1.06E-07	1.1E-07	0.111144651	1.64E-04	275	550729	4162579.51
276	550749	4162579.51	REC	6.10E-04	8.30E-04	2.11E-07	8.68E-07	5.23E-09	1.07E-07	1.1E-07	0.11252306	1.66E-04	276	550749	4162579.51
277	550769	4162579.51	REC	6.20E-04	8.50E-04	2.15E-07	8.88E-07	5.31E-09	1.10E-07	1.2E-07	0.115194201	1.70E-04	277	550769	4162579.51
278	550789	4162579.51	REC	6.40E-04	8.80E-04	2.22E-07	9.20E-07	5.48E-09	1.14E-07	1.2E-07	0.119243752	1.76E-04	278	550789	4162579.51
279	550809	4162579.51	REC	6.70E-04	9.30E-04	2.32E-07	9.72E-07	5.74E-09	1.20E-07	1.3E-07	0.125964444	1.86E-04	279	550809	4162579.51
280	550829	4162579.51	REC	6.90E-04	9.60E-04	2.39E-07	1.00E-06	5.91E-09	1.24E-07	1.3E-07	0.130013995	1.92E-04	280	550829	4162579.51
281	550849	4162579.51	REC	7.00E-04	9.80E-04	2.42E-07	1.02E-06	6.00E-09	1.27E-07	1.3E-07	0.132685136	1.96E-04	281	550849	4162579.51
282	550869	4162579.51	REC	7.10E-04	9.90E-04	2.46E-07	1.03E-06	6.08E-09	1.28E-07	1.3E-07	0.134063545	1.98E-04	282	550869	4162579.51
283	550889	4162579.51	REC	6.80E-04	9.50E-04	2.35E-07	9.93E-07	5.83E-09	1.23E-07	1.3E-07	0.128635586	1.90E-04	283	550889	4162579.51
284	550909	4162579.51	REC	6.50E-04	9.10E-04	2.25E-07	9.51E-07	5.57E-09	1.18E-07	1.2E-07	0.123207627	1.82E-04	284	550909	4162579.51
285	550929	4162579.51	REC	6.40E-04	9.00E-04	2.22E-07	9.41E-07	5.48E-09	1.16E-07	1.2E-07	0.121829218	1.80E-04	285	550929	4162579.51
286	550949	4162579.51	REC	6.40E-04	9.00E-04	2.22E-07	9.41E-07	5.48E-09	1.16E-07	1.2E-07	0.121829218	1.80E-04	286	550949	4162579.51
287	550969	4162579.51	REC	6.40E-04	9.00E-04	2.22E-07	9.41E-07	5.48E-09	1.16E-07	1.2E-07	0.121829218	1.80E-04	287	550969	4162579.51
288	550989	4162579.51	REC	6.30E-04	8.80E-04	2.18E-07	9.20E-07	5.40E-09	1.14E-07	1.2E-07	0.119158076	1.76E-04	288	550989	4162579.51
289	551009	4162579.51	REC	6.20E-04	8.70E-04	2.15E-07	9.09E-07	5.31E-09	1.12E-07	1.2E-07	0.117779667	1.74E-04	289	551009	4162579.51
290	551029	4162579.51	REC	6.10E-04	8.60E-04	2.11E-07	8.99E-07	5.23E-09	1.11E-07	1.2E-07	0.116401259	1.72E-04	290	551029	4162579.51
291	551049	4162579.51	REC	6.00E-04	8.50E-04	2.08E-07	8.88E-07	5.14E-09	1.10E-07	1.2E-07	0.11502285	1.70E-04	291	551049	4162579.51
292	551069	4162579.51	REC	6.10E-04	8.50E-04	2.11E-07	8.88E-07	5.23E-09	1.10E-07	1.2E-07	0.115108526	1.70E-04	292	551069	4162579.51
293	551089	4162579.51	REC	6.10E-04	8.60E-04	2.11E-07	8.99E-07	5.23E-09	1.11E-07	1.2E-07	0.116401259	1.72E-04	293	551089	4162579.51
294	551109	4162579.51	REC	6.10E-04	8.50E-04	2.11E-07	8.88E-07	5.23E-09	1.10E-07	1.2E-07	0.115108526	1.70E-04	294	551109	4162579.51
295	550109	4162599.51	RES	9.00E-04	1.28E-03	3.12E-07	1.34E-06	1.22E-08	2.63E-07	2.7E-07	0.274889907	2.56E-04	295	550109	4162599.51
296	550129	4162599.51	RES	9.70E-04	1.37E-03	3.36E-07	1.43E-06	1.32E-08	2.81E-07	2.9E-07	0.294309474	2.74E-04	296	550129	4162599.51
297	550149	4162599.51	RES	1.04E-03	1.48E-03	3.60E-07	1.55E-06	1.41E-08	3.04E-07	3.2E-07	0.317832956	2.96E-04	297	550149	4162599.51
298	550169	4162599.51	RES	1.12E-03	1.59E-03	3.88E-07	1.66E-06	1.52E-08	3.26E-07	3.4E-07	0.34149243	3.18E-04	298	550169	4162599.51
299	550189	4162599.51	RES	1.20E-03	1.70E-03	4.15E-07	1.78E-06	1.63E-08	3.49E-07	3.7E-07	0.365151905	3.40E-04	299	550189	4162599.51
300	550209	4162599.51	RES	1.29E-03	1.83E-03	4.47E-07	1.91E-06	1.75E-08	3.76E-07	3.9E-07	0.393051287	3.66E-04	300	550209	4162599.51
301	550229	4162599.51	RES	1.40E-03	1.99E-03	4.85E-07	2.08E-06	1.90E-08	4.08E-07	4.3E-07	0.427378527	3.98E-04	301	550229	4162599.51
302	550249	4162599.51	RES	1.52E-03	2.15E-03	5.26E-07	2.25E-06	2.07E-08	4.41E-07	4.6E-07	0.46184176	4.30E-04	302	550249	4162599.51
303	550289	4162599.51	RES	1.75E-03	2.48E-03	6.06E-07	2.59E-06	2.38E-08	5.09E-07	5.3E-07	0.532684191	4.96E-04	303	550289	4162599.51
304	550309	4162599.51	RES	1.84E-03	2.61E-03	6.37E-07	2.73E-06	2.50E-08	5.36E-07	5.6E-07	0.560583573	5.22E-04	304	550309	4162599.51
305	550329	4162599.51	RES	1.95E-03	2.77E-03	6.75E-07	2.90E-06	2.65E-08	5.68E-07	5.9E-07	0.594910813	5.54E-04	305	550329	4162599.51
306	550349	4162599.51	RES	2.01E-03	2.85E-03	6.96E-07	2.98E-06	2.73E-08	5.85E-07	6.1E-07	0.61214243	5.70E-04	306	550349	4162599.51
307	550369	4162599.51	RES	2.00E-03	2.83E-03	6.92E-07	2.96E-06	2.72E-08	5.81E-07	6.1E-07	0.607902522	5.66E-04	307	550369	4162599.51
308	550389	4162599.51	RES	1.96E-03	2.77E-03	6.78E-07	2.90E-06	2.67E-08	5.68E-07	6.0E-07	0.595046806	5.54E-04	308	550389	4162599.51
309	550609	4162599.51	REC	8.70E-04	1.13E-03	3.01E-07	1.18E-06	7.45E-09	1.46E-07	1.5E-07	0.153532619	2.26E-04	309	550609	4162599.51
310	550629	4162599.51	REC	8.00E-04	1.05E-03	2.77E-07	1.10E-06	6.85E-09	1.36E-07	1.4E-07	0.142591025	2.10E-04	310	550629	4162599.51
311	550649	4162599.51	REC	7.50E-04	1.00E-03	2.60E-07	1.05E-06	6.43E-09	1.29E-07	1.4E-07	0.135698981	2.00E-04	311	550649	4162599.51
312	550669	4162599.51	REC	7.10E-04	9.60E-04	2.46E-07	1.00E-06	6.08E-09	1.24E-07	1.3E-07	0.130185346	1.92E-04	312	550669	4162599.51
313	550689	4162599.51	REC	6.90E-04	9.30E-04	2.39E-07	9.72E-07	5.91E-09	1.20E-07	1.3E-07	0.126135796	1.86E-04	313	550689	4162599.51
314	550709	4162599.51	REC	6.80E-04	9.20E-04	2.35E-07	9.62E-07	5.83E-09	1.19E-07	1.2E-07	0.124757387	1.84E-04	314	550709	4162599.51
315	550729	4162599.51	REC	6.80E-04	9.30E-04	2.35E-07	9.72E-07	5.83E-09	1.20E-07	1.3E-07	0.12605012	1.86E-04	315	550729	4162599.51
316	550749	4162599.51	REC	7.00E-04	9.50E-04	2.42E-07	9.93E-07	6.00E-09	1.23E-07	1.3E-07	0.128806937	1.90E-04	316	550749	4162599.51
317	550769	4162599.51	REC	7.20E-04	9.90E-04	2.49E-07	1.03E-06	6.17E-09	1.28E-07	1.3E-07	0.134149221	1.98E-04	317	550769	4162599.51
318	550789	4162599.51	REC	7.50E-04	1.03E-03	2.60E-07	1.08E-06	6.43E-09	1.33E-07	1.4E-07	0.13957718	2.06E-04	318	550789	4162599.51
319	550809	4162599.51	REC	7.70E-04	1.06E-03	2.67E-07	1.11E-06	6.60E-09	1.37E-07	1.4E-07	0.143626731	2.12E-04	319	550809	4162599.51
320	550829	4162599.51	REC	7.90E-04	1.10E-03	2.73E-07	1.15E-06	6.77E-09	1.42E-07	1.5E-07	0.148969014	2.20E-04	320	550829	4162599.51
321	550849	4162599.51	REC	7.90E-04	1.11E-03	2.73E-07	1.16E-06	6.77E-09	1.43E-07	1.5E-07	0.150261747	2.22E-04	321	550849	4162599.51
322	550869	4162599.51	REC	7.90E-04	1.11E-03	2.73E-07	1.16E-06	6.77E-09	1.43E-07	1.5E-07	0.150261747	2.22E-04	322	550869	4162599.51
323	550889	4162599.51	REC	7.90E-04	1.10E-03	2.73E-07	1.15E-06	6.77E-09	1.42E-07	1.5E-07	0.148969014	2.20E-04	323	550889	4162599.51
324	550909	4162599.51	REC	7.60E-04	1.06E-03	2.63E-07	1.11E-06	6.51E-09	1.37E-07	1.4E-07	0.143541055	2.12E-04	324	550909	4162599.51
325	550929	4162599.51	REC	7.40E-04	1.04E-03	2.56E-07	1.09E-06	6.34E-09	1.34E-07	1.4E-07	0.140784237	2.08E-04	325	550929	4162599.51
326	550949	4162599.51	REC	7.30E-04	1.03E-03	2.53E-07	1.08E-06	6.25E-09	1.33E-07	1.4E-07	0.139405829	2.06E-04	326	550949	4162599.51
327	550969	4162599.51	REC	7.20E-04	1.01E-03	2.49E-07	1.06E-06	6.17E-09	1.31E-07	1.4E-07	0.136734687	2.02E-04	327	550969	4162599.51
328	550989	4162599.51	REC	7.00E-04	9.90E-04	2.42E-07	1.03E-06	6.00E-09	1.28E-07	1.3E-07	0.133977869	1.98E-04	328	550989	4162599.51
329	551009	4162599.51	REC	6.80E-04	9.60E-04	2.35E-07	1.00E-06	5.83E-09	1.24E-07	1.3E-07	0.129928319	1.92E-04	329	551009	4162599.51
330	551029	4162599.51	REC	6.70E-04	9.50E-04	2.32E-07	9.93E-07	5.74E-09	1.23E-07	1.3E-07	0.12854991	1.90E-04	330	551029	4162599.51
331	551049	4162599.51	REC	6.70E-04	9.40E-04	2.32E-07	9.82E-07	5.74E-09	1.22E-07	1.3E-07	0.127257177	1.88E-04	331	551049	4162599.51
332	551069	4162599.51	REC	6.60E-04	9.30E-04	2.28E-07	9.72E-07	5.65E-09	1.20E-07	1.3E-07	0.125878768	1.86E-04	332	551069	4162599.51
333	551089	4162599.51	REC	6.50E-04	9.20E-04	2.25E-07	9.62E-07	5.57E-09	1.19E-07	1.2E-07	0.12450036	1.84E-04	333	551089	4162599.51
334	551109	4162599.51	REC	6.50E-04	9.10E-04	2.25E-07	9.51E-07	5.57E-09	1.18E-07	1.2E-07	0.123207627	1.82E-04	334	551109	4162599.51
335	550089	4162619.51	RES	8.70E-04	1.22E-03	3.01E-07	1.28E-06	1.18E-08	2.50E-07	2.6E-07	0.262170184	2.44E-04	335	550089	4162619.51
336	550109	4162619.51	RES	9.30E-04	1.32E-03	3.22E-07	1.38E-06	1.26E-08	2.71E-07	2.8E-07	0.283505715	2.64E-04	336	550109	4162619.51
337	550129	4162619.51	RES	1.00E-03	1.42E-03	3.46E-07	1.48E-06	1.36E-08	2.91E-07	3.0E-07	0.30497724	2.84E-04	337	550129	4162619.51
338	550149	4162619.51	RES	1.08E-03	1.53E-03	3.74E-07	1.60E-06	1.47E-08	3.14E-07	3.3E-07	0.328636714	3.06E-04	338	550149	4162619.51
339	550169	4162619.51	RES	1.17E-03	1.65E-03	4.05E-07	1.72E-06	1.59E-08	3.39E-07	3.5E-07	0.354484139	3.30E-04	339	550169	4162619.51
340	550189	4162619.51	RES	1.26E-03	1.78E-03	4.36E-07	1.86E-06	1.71E-08	3.65E-07	3.8E-07	0.382383521	3.56E-04	340	550189	4162619.51
341	550229	4162619.51	RES	1.48E-03	2.10E-03	5.12E-07	2.19E-06	2.01E-08	4.31E-07	4.5E-07	0.451038002	4.20E-04	341	550229	4162619.51
342	550249	4162619.51	RES	1.63E-03	2.31E-03	5.64E-07	2.41E-06	2.22E-08	4.74E-07	5.0E-07	0.496169	4.62E-04	342	550249	4162619.51
343	550269	4162619.51	RES	1.78E-03	2.53E-03	6.16E-07	2.64E-06	2.42E-08	5.19E-07	5.4E-07	0.543351956	5.06E-04	343	550269	4162619.51
344	550309	4162619.51	RES	2.05E-03	2.91E-03	7.10E-07	3.04E-06	2.79E-08	5.97E-07	6.2E-07	0.624998146	5.82E-04	344	550309	4162619.51
345	550329	4162619.51	RES	2.15E-03	3.05E-03	7.44E-07	3.19E-06	2.92E-08	6.26E-07	6.6E-07	0.655085478	6.10E-04	345	550329	4162619.51
346	550349	4162619.51	RES	2.24E-03	3.18E-03	7.75E-07	3.32E-06	3.05E-08	6.53E-07	6.8E-07	0.68298486	6.36E-04	346	550349	4162619.51
347	550369	4162619.51	RES	2.26E-03	3.20E-03	7.82E-07	3.34E-06	3.07E-08	6.57E-07	6.9E-07	0.687360761	6.40E-04	347	550369	4162619.51
348	550389	4162619.51	RES	2.25E-03	3.18E-03	7.79E-07	3.32E-06	3.06E-08	6.53E-07	6.8E-07	0.683120853	6.36E-04	348	550389	4162619.51
349	550609	4162619.51	RES	9.70E-04	1.26E-03	3.36E-07	1.32E-06	8.31E-09	1.63E-07	1.7E-07	0.171194905	2.52E-04	349	550609	4162619.51
350	550629	4162619.51	RES	9.00E-04	1.18E-03	3.12E-07	1.23E-06	7.71E-09	1.53E-07	1.6E-07	0.160253311	2.36E-04	350	550629	4162619.51
351	550649	4162619.51	RES	8.40E-04	1.13E-03	2.91E-07	1.18E-06	7.20E-09	1.46E-07	1.5E-07	0.153275592	2.26E-04	351	550649	4162619.51
352	550669	4162619.51	RES	8.10E-04	1.09E-03	2.80E-07	1.14E-06	6.94E-09	1.41E-07	1.5E-07	0.147847632	2.18E-04	352	550669	4162619.51
353	550689	4162619.51	RES	7.80E-04	1.06E-03	2.70E-07	1.11E-06	6.68E-09	1.37E-07	1.4E-07	0.143712406	2.12E-04	353	550689	4162619.51
354	550709	4162619.51	RES	7.70E-04	1.05E-03	2.67E-07	1.10E-06	6.60E-09	1.36E-07	1.4E-07	0.142333998	2.10E-04	354	550709	4162619.51
355	550729	4162619.51	RES	7.80E-04	1.07E-03	2.70E-07	1.12E-06	6.68E-09	1.38E-07	1.5E-07	0.145005139	2.14E-04	355	550729	4162619.51
356	550749	4162619.51	RES	7.90E-04	1.09E-03	2.73E-07	1.14E-06	6.77E-09	1.41E-07	1.5E-07	0.147676281	2.18E-04	356	550749	4162619.51
357	550769	4162619.51	RES	8.30E-04	1.15E-03	2.87E-07	1.20E-06	7.11E-09	1.49E-07	1.6E-07	0.155775382	2.30E-04	357	550769	4162619.51
358	550789	4162619.51	RES	8.60E-04	1.19E-03	2.98E-07	1.24E-06	7.37E-09	1.54E-07	1.6E-07	0.161203341	2.38E-04	358	550789	4162619.51
359	550809	4162619.51	RES	8.70E-04	1.21E-03	3.01E-07	1.26E-06	7.45E-09	1.56E-07	1.6E-07	0.163874483	2.42E-04	359	550809	4162619.51
360	550829	4162619.51	RES	8.80E-04	1.23E-03	3.05E-07	1.29E-06	7.54E-09	1.59E-07	1.7E-07	0.166545625	2.46E-04	360	550829	4162619.51
361	550849	4162619.51	RES	8.80E-04	1.24E-03	3.05E-07	1.30E-06	7.54E-09	1.60E-07	1.7E-07	0.167838358	2.48E-04	361	550849	4162619.51
362	550869	4162619.51	RES	8.70E-04	1.22E-03	3.01E-07	1.28E-06	7.45E-09	1.58E-07	1.7E-07	0.165167216	2.44E-04	362	550869	4162619.51
363	550889	4162619.51	RES	8.70E-04	1.22E-03	3.01E-07	1.28E-06	7.45E-09	1.58E-07	1.7E-07	0.165167216	2.44E-04	363	550889	4162619.51
364	550909	4162619.51	RES	8.60E-04	1.21E-03	2.98E-07	1.26E-06	7.37E-09	1.56E-07	1.6E-07	0.163788807	2.42E-04	364	550909	4162619.51
365	550929	4162619.51	RES	8.40E-04	1.19E-03	2.91E-07	1.24E-06	7.20E-09	1.54E-07	1.6E-07	0.16103199	2.38E-04	365	550929	4162619.51
366	550949	4162619.51	RES	8.20E-04	1.16E-03	2.84E-07	1.21E-06	7.03E-09	1.50E-07	1.6E-07	0.156982439	2.32E-04	366	550949	4162619.51
367	550969	4162619.51	RES	8.00E-04	1.13E-03	2.77E-07	1.18E-06	6.85E-09	1.46E-07	1.5E-07	0.152932889	2.26E-04	367	550969	4162619.51
368	550989	4162619.51	RES	7.80E-04	1.09E-03	2.70E-07	1.14E-06	6.68E-09	1.41E-07	1.5E-07	0.147590605	2.18E-04	368	550989	4162619.51
369	551009	4162619.51	RES	7.50E-04	1.06E-03	2.60E-07	1.11E-06	6.43E-09	1.37E-07	1.4E-07	0.143455379	2.12E-04	369	551009	4162619.51
370	551029	4162619.51	RES	7.40E-04	1.04E-03	2.56E-07	1.09E-06	6.34E-09	1.34E-07	1.4E-07	0.140784237	2.08E-04	370	551029	4162619.51
371	551049	4162619.51	RES	7.30E-04	1.03E-03	2.53E-07	1.08E-06	6.25E-09	1.33E-07	1.4E-07	0.139405829	2.06E-04	371	551049	4162619.51
372	551069	4162619.51	RES	7.10E-04	1.00E-03	2.46E-07	1.05E-06	6.08E-09	1.29E-07	1.4E-07	0.135356278	2.00E-04	372	551069	4162619.51
373	551089	4162619.51	RES	7.10E-04	1.00E-03	2.46E-07	1.05E-06	6.08E-09	1.29E-07	1.4E-07	0.135356278	2.00E-04	373	551089	4162619.51
374	551109	4162619.51	RES	6.90E-04	9.70E-04	2.39E-07	1.01E-06	5.91E-09	1.25E-07	1.3E-07	0.131306728	1.94E-04	374	551109	4162619.51
375	550069	4162639.51	RES	8.30E-04	1.17E-03	2.87E-07	1.22E-06	1.13E-08	2.40E-07	2.5E-07	0.251366426	2.34E-04	375	550069	4162639.51
376	550089	4162639.51	RES	8.90E-04	1.26E-03	3.08E-07	1.32E-06	1.21E-08	2.59E-07	2.7E-07	0.27065	2.52E-04	376	550089	4162639.51
377	550109	4162639.51	RES	9.60E-04	1.36E-03	3.32E-07	1.42E-06	1.31E-08	2.79E-07	2.9E-07	0.292121524	2.72E-04	377	550109	4162639.51

378	550129	4162639.51	RES	1.04E-03	1.47E-03	3.60E-07	1.54E-06	1.41E-08	3.02E-07	3.2E-07	0.315780998	2.94E-04	378	550129	4162639.51
379	550149	4162639.51	RES	1.12E-03	1.59E-03	3.88E-07	1.66E-06	1.52E-08	3.26E-07	3.4E-07	0.34149243	3.18E-04	379	550149	4162639.51
380	550169	4162639.51	RES	1.21E-03	1.72E-03	4.19E-07	1.80E-06	1.65E-08	3.53E-07	3.7E-07	0.369391812	3.44E-04	380	550169	4162639.51
381	550249	4162639.51	RES	1.73E-03	2.46E-03	5.99E-07	2.57E-06	2.35E-08	5.05E-07	5.3E-07	0.52830829	4.92E-04	381	550249	4162639.51
382	550269	4162639.51	RES	1.94E-03	2.76E-03	6.72E-07	2.88E-06	2.64E-08	5.66E-07	5.9E-07	0.592722863	5.52E-04	382	550269	4162639.51
383	550289	4162639.51	RES	2.13E-03	3.02E-03	7.37E-07	3.16E-06	2.90E-08	6.20E-07	6.5E-07	0.64865762	6.04E-04	383	550289	4162639.51
384	550309	4162639.51	RES	2.31E-03	3.28E-03	8.00E-07	3.43E-06	3.14E-08	6.73E-07	7.0E-07	0.704456384	6.56E-04	384	550309	4162639.51
385	550329	4162639.51	RES	2.44E-03	3.47E-03	8.45E-07	3.63E-06	3.32E-08	7.12E-07	7.5E-07	0.745211482	6.94E-04	385	550329	4162639.51
386	550349	4162639.51	RES	2.54E-03	3.61E-03	8.79E-07	3.77E-06	3.45E-08	7.41E-07	7.8E-07	0.775298815	7.22E-04	386	550349	4162639.51
387	550369	4162639.51	RES	2.60E-03	3.69E-03	9.00E-07	3.86E-06	3.54E-08	7.57E-07	7.9E-07	0.792530432	7.38E-04	387	550369	4162639.51
388	550389	4162639.51	RES	2.59E-03	3.67E-03	8.97E-07	3.84E-06	3.52E-08	7.53E-07	7.9E-07	0.788290524	7.34E-04	388	550389	4162639.51
389	550629	4162639.51	REC	1.02E-03	1.35E-03	3.53E-07	1.41E-06	8.74E-09	1.75E-07	1.8E-07	0.183257881	2.70E-04	389	550629	4162639.51
390	550649	4162639.51	REC	9.70E-04	1.29E-03	3.36E-07	1.35E-06	8.31E-09	1.67E-07	1.8E-07	0.175073104	2.58E-04	390	550649	4162639.51
391	550669	4162639.51	REC	9.30E-04	1.26E-03	3.22E-07	1.32E-06	7.97E-09	1.63E-07	1.7E-07	0.170852202	2.52E-04	391	550669	4162639.51
392	550689	4162639.51	REC	9.10E-04	1.23E-03	3.15E-07	1.29E-06	7.80E-09	1.59E-07	1.7E-07	0.166802652	2.46E-04	392	550689	4162639.51
393	550709	4162639.51	REC	8.90E-04	1.22E-03	3.08E-07	1.28E-06	7.63E-09	1.58E-07	1.7E-07	0.165338568	2.44E-04	393	550709	4162639.51
394	550729	4162639.51	REC	8.90E-04	1.22E-03	3.08E-07	1.28E-06	7.63E-09	1.58E-07	1.7E-07	0.165338568	2.44E-04	394	550729	4162639.51
395	550749	4162639.51	REC	8.90E-04	1.24E-03	3.08E-07	1.30E-06	7.63E-09	1.60E-07	1.7E-07	0.167924034	2.48E-04	395	550749	4162639.51
396	550769	4162639.51	REC	9.30E-04	1.29E-03	3.22E-07	1.35E-06	7.97E-09	1.67E-07	1.7E-07	0.174730402	2.58E-04	396	550769	4162639.51
397	550789	4162639.51	REC	9.50E-04	1.31E-03	3.29E-07	1.37E-06	8.14E-09	1.69E-07	1.8E-07	0.177487219	2.62E-04	397	550789	4162639.51
398	550809	4162639.51	REC	9.40E-04	1.30E-03	3.25E-07	1.36E-06	8.05E-09	1.68E-07	1.8E-07	0.17610881	2.60E-04	398	550809	4162639.51
399	550829	4162639.51	REC	9.40E-04	1.31E-03	3.25E-07	1.37E-06	8.05E-09	1.69E-07	1.8E-07	0.177401543	2.62E-04	399	550829	4162639.51
400	550849	4162639.51	REC	9.40E-04	1.31E-03	3.25E-07	1.37E-06	8.05E-09	1.69E-07	1.8E-07	0.177401543	2.62E-04	400	550849	4162639.51
401	550869	4162639.51	REC	9.30E-04	1.30E-03	3.22E-07	1.36E-06	7.97E-09	1.68E-07	1.8E-07	0.176023135	2.60E-04	401	550869	4162639.51
402	550889	4162639.51	REC	9.30E-04	1.31E-03	3.22E-07	1.37E-06	7.97E-09	1.69E-07	1.8E-07	0.177315868	2.62E-04	402	550889	4162639.51
403	550909	4162639.51	REC	9.40E-04	1.32E-03	3.25E-07	1.38E-06	8.05E-09	1.71E-07	1.8E-07	0.178694276	2.64E-04	403	550909	4162639.51
404	550929	4162639.51	REC	9.20E-04	1.30E-03	3.18E-07	1.36E-06	7.88E-09	1.68E-07	1.8E-07	0.175937459	2.60E-04	404	550929	4162639.51
405	550949	4162639.51	REC	9.00E-04	1.27E-03	3.12E-07	1.33E-06	7.71E-09	1.64E-07	1.7E-07	0.171887908	2.54E-04	405	550949	4162639.51
406	550969	4162639.51	REC	8.80E-04	1.24E-03	3.05E-07	1.30E-06	7.54E-09	1.60E-07	1.7E-07	0.167838358	2.48E-04	406	550969	4162639.51
407	550989	4162639.51	REC	8.50E-04	1.20E-03	2.94E-07	1.25E-06	7.28E-09	1.55E-07	1.6E-07	0.162410399	2.40E-04	407	550989	4162639.51
408	551009	4162639.51	REC	8.30E-04	1.17E-03	2.87E-07	1.22E-06	7.11E-09	1.51E-07	1.6E-07	0.158360848	2.34E-04	408	551009	4162639.51
409	551029	4162639.51	REC	8.10E-04	1.14E-03	2.80E-07	1.19E-06	6.94E-09	1.47E-07	1.5E-07	0.154311298	2.28E-04	409	551029	4162639.51
410	551049	4162639.51	REC	7.90E-04	1.11E-03	2.73E-07	1.16E-06	6.77E-09	1.43E-07	1.5E-07	0.150261747	2.22E-04	410	551049	4162639.51
411	551069	4162639.51	REC	7.70E-04	1.09E-03	2.67E-07	1.14E-06	6.60E-09	1.41E-07	1.5E-07	0.14750493	2.18E-04	411	551069	4162639.51
412	551089	4162639.51	REC	7.50E-04	1.06E-03	2.60E-07	1.11E-06	6.43E-09	1.37E-07	1.4E-07	0.143455379	2.12E-04	412	551089	4162639.51
413	551109	4162639.51	REC	7.30E-04	1.03E-03	2.53E-07	1.08E-06	6.25E-09	1.33E-07	1.4E-07	0.139405829	2.06E-04	413	551109	4162639.51
414	550049	4162659.51	RES	7.90E-04	1.12E-03	2.73E-07	1.17E-06	1.07E-08	2.30E-07	2.4E-07	0.240562667	2.24E-04	414	550049	4162659.51
415	550069	4162659.51	RES	8.50E-04	1.20E-03	2.94E-07	1.25E-06	1.16E-08	2.46E-07	2.6E-07	0.257794284	2.40E-04	415	550069	4162659.51
416	550089	4162659.51	RES	9.20E-04	1.29E-03	3.18E-07	1.35E-06	1.25E-08	2.65E-07	2.8E-07	0.277213851	2.58E-04	416	550089	4162659.51
417	550129	4162659.51	RES	1.07E-03	1.51E-03	3.70E-07	1.58E-06	1.46E-08	3.10E-07	3.2E-07	0.324396807	3.02E-04	417	550129	4162659.51
418	550149	4162659.51	RES	1.16E-03	1.64E-03	4.02E-07	1.71E-06	1.58E-08	3.37E-07	3.5E-07	0.352296189	3.28E-04	418	550149	4162659.51
419	550269	4162659.51	RES	2.10E-03	2.99E-03	7.27E-07	3.13E-06	2.86E-08	6.14E-07	6.4E-07	0.642093769	5.98E-04	419	550269	4162659.51
420	550289	4162659.51	RES	2.35E-03	3.34E-03	8.13E-07	3.49E-06	3.20E-08	6.85E-07	7.2E-07	0.7173121	6.68E-04	420	550289	4162659.51
421	550309	4162659.51	RES	2.60E-03	3.70E-03	9.00E-07	3.87E-06	3.54E-08	7.59E-07	7.9E-07	0.794582389	7.40E-04	421	550309	4162659.51
422	550329	4162659.51	RES	2.82E-03	4.01E-03	9.76E-07	4.19E-06	3.84E-08	8.23E-07	8.6E-07	0.861184912	8.02E-04	422	550329	4162659.51
423	550349	4162659.51	RES	2.96E-03	4.21E-03	1.02E-06	4.40E-06	4.03E-08	8.64E-07	9.0E-07	0.90412796	8.42E-04	423	550349	4162659.51
424	550369	4162659.51	RES	3.03E-03	4.31E-03	1.05E-06	4.50E-06	4.12E-08	8.84E-07	9.3E-07	0.925599484	8.62E-04	424	550369	4162659.51
425	550389	4162659.51	RES	2.99E-03	4.25E-03	1.04E-06	4.44E-06	4.07E-08	8.72E-07	9.1E-07	0.912743769	8.50E-04	425	550389	4162659.51
426	550649	4162659.51	REC	1.12E-03	1.52E-03	3.88E-07	1.59E-06	9.60E-09	1.96E-07	2.1E-07	0.2060911	3.04E-04	426	550649	4162659.51
427	550669	4162659.51	REC	1.08E-03	1.47E-03	3.74E-07	1.54E-06	9.25E-09	1.90E-07	2.0E-07	0.199284732	2.94E-04	427	550669	4162659.51
428	550689	4162659.51	REC	1.05E-03	1.44E-03	3.63E-07	1.51E-06	9.00E-09	1.86E-07	2.0E-07	0.195149505	2.88E-04	428	550689	4162659.51
429	550709	4162659.51	REC	1.03E-03	1.42E-03	3.57E-07	1.48E-06	8.82E-09	1.84E-07	1.9E-07	0.192392688	2.84E-04	429	550709	4162659.51
430	550729	4162659.51	REC	1.02E-03	1.41E-03	3.53E-07	1.47E-06	8.74E-09	1.82E-07	1.9E-07	0.191014279	2.82E-04	430	550729	4162659.51
431	550749	4162659.51	REC	1.02E-03	1.41E-03	3.53E-07	1.47E-06	8.74E-09	1.82E-07	1.9E-07	0.191014279	2.82E-04	431	550749	4162659.51
432	550769	4162659.51	REC	1.01E-03	1.41E-03	3.50E-07	1.47E-06	8.65E-09	1.82E-07	1.9E-07	0.190928604	2.82E-04	432	550769	4162659.51
433	550789	4162659.51	REC	1.00E-03	1.40E-03	3.46E-07	1.46E-06	8.57E-09	1.81E-07	1.9E-07	0.189550195	2.80E-04	433	550789	4162659.51
434	550809	4162659.51	REC	9.90E-04	1.38E-03	3.43E-07	1.44E-06	8.48E-09	1.78E-07	1.9E-07	0.186879053	2.76E-04	434	550809	4162659.51
435	550829	4162659.51	REC	9.80E-04	1.37E-03	3.39E-07	1.43E-06	8.40E-09	1.77E-07	1.9E-07	0.185500644	2.74E-04	435	550829	4162659.51
436	550849	4162659.51	REC	9.70E-04	1.36E-03	3.36E-07	1.42E-06	8.31E-09	1.76E-07	1.8E-07	0.184122236	2.72E-04	436	550849	4162659.51
437	550869	4162659.51	REC	9.70E-04	1.36E-03	3.36E-07	1.42E-06	8.31E-09	1.76E-07	1.8E-07	0.184122236	2.72E-04	437	550869	4162659.51
438	550889	4162659.51	REC	9.90E-04	1.39E-03	3.43E-07	1.45E-06	8.48E-09	1.80E-07	1.9E-07	0.188171786	2.78E-04	438	550889	4162659.51
439	550909	4162659.51	REC	1.00E-03	1.41E-03	3.46E-07	1.47E-06	8.57E-09	1.82E-07	1.9E-07	0.190842928	2.82E-04	439	550909	4162659.51
440	550929	4162659.51	REC	9.90E-04	1.40E-03	3.43E-07	1.46E-06	8.48E-09	1.81E-07	1.9E-07	0.189464519	2.80E-04	440	550929	4162659.51
441	550949	4162659.51	REC	9.80E-04	1.38E-03	3.39E-07	1.44E-06	8.40E-09	1.78E-07	1.9E-07	0.186793377	2.76E-04	441	550949	4162659.51
442	550969	4162659.51	REC	9.50E-04	1.34E-03	3.29E-07	1.40E-06	8.14E-09	1.73E-07	1.8E-07	0.181365418	2.68E-04	442	550969	4162659.51
443	550989	4162659.51	REC	9.20E-04	1.30E-03	3.18E-07	1.36E-06	7.88E-09	1.68E-07	1.8E-07	0.175937459	2.60E-04	443	550989	4162659.51
444	551009	4162659.51	REC	9.00E-04	1.27E-03	3.12E-07	1.33E-06	7.71E-09	1.64E-07	1.7E-07	0.171887908	2.54E-04	444	551009	4162659.51
445	551029	4162659.51	REC	8.70E-04	1.23E-03	3.01E-07	1.29E-06	7.45E-09	1.59E-07	1.7E-07	0.166459949	2.46E-04	445	551029	4162659.51
446	551049	4162659.51	REC	8.50E-04	1.19E-03	2.94E-07	1.24E-06	7.28E-09	1.54E-07	1.6E-07	0.161117666	2.38E-04	446	551049	4162659.51
447	551069	4162659.51	REC	8.20E-04	1.16E-03	2.84E-07	1.21E-06	7.03E-09	1.50E-07	1.6E-07	0.156982439	2.32E-04	447	551069	4162659.51
448	551089	4162659.51	REC	8.00E-04	1.12E-03	2.77E-07	1.17E-06	6.85E-09	1.45E-07	1.5E-07	0.151640156	2.24E-04	448	551089	4162659.51
449	551109	4162659.51	REC	7.70E-04	1.08E-03	2.67E-07	1.13E-06	6.60E-09	1.40E-07	1.5E-07	0.146212197	2.16E-04	449	551109	4162659.51
450	550049	4162679.51	RES	8.10E-04	1.14E-03	2.80E-07	1.19E-06	1.10E-08	2.34E-07	2.4E-07	0.244938568	2.28E-04	450	550049	4162679.51
451	550069	4162679.51	RES	8.70E-04	1.22E-03	3.01E-07	1.28E-06	1.18E-08	2.50E-07	2.6E-07	0.262170184	2.44E-04	451	550069	4162679.51
452	550109	4162679.51	RES	1.02E-03	1.43E-03	3.53E-07	1.49E-06	1.39E-08	2.93E-07	3.1E-07	0.307301183	2.86E-04	452	550109	4162679.51
453	550129	4162679.51	RES	1.10E-03	1.56E-03	3.81E-07	1.63E-06	1.50E-08	3.20E-07	3.4E-07	0.335064572	3.12E-04	453	550129	4162679.51
454	550289	4162679.51	RES	2.61E-03	3.72E-03	9.03E-07	3.89E-06	3.55E-08	7.63E-07	8.0E-07	0.798822296	7.44E-04	454	550289	4162679.51
455	550309	4162679.51	RES	2.93E-03	4.18E-03	1.01E-06	4.37E-06	3.98E-08	8.58E-07	9.0E-07	0.897564109	8.36E-04	455	550309	4162679.51
456	550329	4162679.51	RES	3.24E-03	4.62E-03	1.12E-06	4.83E-06	4.41E-08	9.48E-07	9.9E-07	0.992066014	9.24E-04	456	550329	4162679.51
457	550349	4162679.51	RES	3.47E-03	4.96E-03	1.20E-06	5.18E-06	4.72E-08	1.02E-06	1.1E-06	1.064960402	9.92E-04	457	550349	4162679.51
458	550369	4162679.51	RES	3.56E-03	5.07E-03	1.23E-06	5.30E-06	4.84E-08	1.04E-06	1.1E-06	1.08875587	1.01E-03	458	550369	4162679.51
459	550649	4162679.51	REC	1.33E-03	1.80E-03	4.60E-07	1.88E-06	1.14E-08	2.33E-07	2.4E-07	0.244086814	3.60E-04	459	550649	4162679.51
460	550669	4162679.51	REC	1.28E-03	1.74E-03	4.43E-07	1.82E-06	1.10E-08	2.25E-07	2.4E-07	0.235902038	3.48E-04	460	550669	4162679.51
461	550689	4162679.51	REC	1.23E-03	1.70E-03	4.26E-07	1.78E-06	1.05E-08	2.20E-07	2.3E-07	0.230302727	3.40E-04	461	550689	4162679.51
462	550709	4162679.51	REC	1.20E-03	1.65E-03	4.15E-07	1.72E-06	1.03E-08	2.13E-07	2.2E-07	0.223582035	3.30E-04	462	550709	4162679.51
463	550729	4162679.51	REC	1.17E-03	1.62E-03	4.05E-07	1.69E-06	1.00E-08	2.09E-07	2.2E-07	0.219446809	3.24E-04	463	550729	4162679.51
464	550749	4162679.51	REC	1.15E-03	1.59E-03	3.98E-07	1.66E-06	9.85E-09	2.06E-07	2.2E-07	0.215397258	3.18E-04	464	550749	4162679.51
465	550769	4162679.51	REC	1.12E-03	1.57E-03	3.88E-07	1.64E-06	9.60E-09	2.03E-07	2.1E-07	0.212554765	3.14E-04	465	550769	4162679.51
466	550789	4162679.51	REC	1.10E-03	1.53E-03	3.81E-07	1.60E-06	9.42E-09	1.98E-07	2.1E-07	0.207212481	3.06E-04	466	550789	4162679.51
467	550809	4162679.51	REC	1.07E-03	1.50E-03	3.70E-07	1.57E-06	9.17E-09	1.94E-07	2.0E-07	0.203077255	3.00E-04	467	550809	4162679.51
468	550829	4162679.51	REC	1.05E-03	1.47E-03	3.63E-07	1.54E-06	9.00E-09	1.90E-07	2.0E-07	0.199027705	2.94E-04	468	550829	4162679.51
469	550849	4162679.51	REC	1.03E-03	1.45E-03	3.57E-07	1.52E-06	8.82E-09	1.87E-07	2.0E-07	0.196270887	2.90E-04	469	550849	4162679.51
470	550869	4162679.51	REC	1.03E-03	1.45E-03	3.57E-07	1.52E-06	8.82E-09	1.87E-07	2.0E-07	0.196270887	2.90E-04	470	550869	4162679.51
471	550889	4162679.51	REC	1.05E-03	1.47E-03	3.63E-07	1.54E-06	9.00E-09	1.90E-07	2.0E-07	0.199027705	2.94E-04	471	550889	4162679.51
472	550909	4162679.51	REC	1.06E-03	1.49E-03	3.67E-07	1.56E-06	9.08E-09	1.93E-07	2.0E-07	0.201698846	2.98E-04	472	550909	4162679.51
473	550929	4162679.51	REC	1.06E-03	1.49E-03	3.67E-07	1.56E-06	9.08E-09	1.93E-07	2.0E-07	0.201698846	2.98E-04	473	550929	4162679.51
474	550949	4162679.51	REC	1.05E-03	1.48E-03	3.63E-07	1.55E-06	9.00E-09	1.91E-07	2.0E-07	0.200320438	2.96E-04	474	550949	4162679.51
475	550969	4162679.51	REC	1.02E-03	1.44E-03	3.53E-07	1.51E-06	8.74E-09	1.86E-07	1.9E-07	0.194892478	2.88E-04	475	550969	4162679.51
476	550989	4162679.51	REC	9.90E-04	1.40E-03	3.43E-07	1.46E-06	8.48E-09	1.81E-07	1.9E-07	0.189464519	2.80E-04	476	550989	4162679.51
477	551009	4162679.51	REC	9.60E-04	1.35E-03	3.32E-07	1.41E-06	8.22E-09	1.75E-07	1.8E-07	0.182743827	2.70E-04	477	551009	4162679.51
478	551029	4162679.51	REC	9.30E-04	1.31E-03	3.22E-07	1.37E-06	7.97E-09	1.69E-07	1.8E-07	0.177315868	2.62E-04	478	551029	4162679.51
479	551049	4162679.51	REC	9.00E-04	1.27E-03	3.12E-07	1.33E-06	7.71E-09	1.64E-07	1.7E-07	0.171887908	2.54E-04	479	551049	4162679.51
480	551069	4162679.51	REC	8.70E-04	1.23E-03	3.01E-07	1.29E-06	7.45E-09	1.59E-07	1.7E-07	0.166459949	2.46E-04	480	551069	4162679.51
481	551089	4162679.51	REC	8.40E-04	1.18E-03	2.91E-07	1.23E-06	7.20E-09	1.53E-07	1.6E-07	0.159739257	2.36E-04	481	551089	4162679.51
482	551109	4162679.51	REC	8.00E-04	1.13E-03	2.77E-07	1.18E-06	6.85E-09	1.46E-07	1.5E-07	0.152932889	2.26E-04	482	551109	4162679.51
483	550049	4162699.51	RES	8.20E-04	1.16E-03	2.84E-07	1.21E-06	1.12E-08	2.38E-07	2.5E-07	0.249178475	2.32E-04	483	550049	4162699.51
484	550069	4162699.51	RES	8.90E-04	1.25E-03	3.08E-07	1.31E-06	1.21E-08	2.56E-07	2.7E-07	0.268598042	2.50E-04	484	550069	4162699.51
485	550089	4162699.51	RES	9.60E-04	1.35E-03	3.32E-07	1.41E-06	1.31E-08	2.77E-07	2.9E-07	0.290069567	2.70E-04	485	550089	4162699.51
486	550109	4162699.51	RES	1.04E-03	1.47E-03	3.60E-07	1.54E-06	1.41E-08	3.02E-07	3.2E-07	0.315780998	2.94E-04	486	550109	4162699.51
487	550129	4162699.51	RES	1.14E-03	1.61E-03	3.95E-07	1.68E-06	1.55E-08	3.30E-07	3.5E-07	0.345868331	3.22E-04	487	550129	4162699.51
488	550309	4162699.51	RES	3.41E-03	4.86E-03	1.18E-06	5.08E-06	4.64E-08	9.97E-07	1.0E-06	1.043624871	9.72E-04	488	550309	4162699.51
489	550329	4162699.51	RES	3.80E-03	5.43E-03	1.32E-06	5.68E-06	5.17E-08	1.11E-06	1.2E-06	1.165890165	1.09E-03	489	550329	4162699.51
490	550349	4162699.51	RES	4.09E-03	5.84E-03	1.42E-06	6.10E-06	5.56E-08	1.20E-06	1.3E-06	1.253964212	1.17E-03	490	550349	4162699.51
491	550369	4162699.51	RES	4.24E-03	6.05E-03	1.47E-06	6.32E-06	5.77E-08	1.24E-06	1.3E-06	1.299095211	1.21E-03	491	550369	4162699.51
492	550389	4162699.51	RES	4.19E-03	5.98E-03	1.45E-06	6.25E-06	5.70E-08	1.23E-06	1.3E-06	1.284051545	1.20E-03	492	550389	4162699.51
493	550669	4162699.51	REC	1.51E-03	2.07E-03	5.23E-07	2.16E-06	1.29E-08	2.68E-07	2.8E-07	0.280532769	4.14E-04	493	550669	4162699.51
494	550689	4162699.51	REC	1.44E-03	1.99E-03	4.98E-07	2.08E-06	1.23E-08	2.57E-07	2.7E-07	0.269591175	3.98E-04	494	550689	4162699.51
495	550709	4162699.51	REC	1.39E-03	1.92E-03	4.81E-07	2.01E-06	1.19E-08	2.48E-07	2.6E-07	0.260113665	3.84E-04	495	550709	4162699.51
496	550729	4162699.51	REC	1.34E-03	1.86E-03	4.64E-07	1.94E-06	1.15E-08	2.40E-07	2.5E-07	0.251928888	3.72E-04	496	550729	4162699.51
497	550749	4162699.51	REC	1.29E-03	1.80E-03	4.47E-07	1.88E-06	1.11E-08	2.33E-07	2.4E-07	0.243744112	3.60E-04	497	550749	4162699.51
498	550769	4162699.51	REC	1.25E-03	1.74E-03	4.33E-07	1.82E-06	1.07E-08	2.25E-07	2.4E-07	0.235645011	3.48E-04	498	550769	4162699.51
499	550789	4162699.51	REC	1.21E-03	1.69E-03	4.19E-07	1.77E-06	1.04E-08	2.18E-07	2.3E-07	0.228838643	3.38E-04	499	550789	4162699.51
500	550809	4162699.51	REC	1.17E-03	1.64E-03	4.05E-07	1.71E-06	1.00E-08	2.12E-07	2.2E-07	0.222032275	3.28E-04	500	550809	4162699.51
501	550829	4162699.51	REC	1.14E-03	1.60E-03	3.95E-07	1.67E-06	9.77E-09	2.07E-07	2.2E-07	0.216604315	3.20E-04	501	550829	4162699.51
502	550849	4162699.51	REC	1.13E-03	1.58E-03	3.91E-07	1.65E-06	9.68E-09	2.04E-07	2.1E-07	0.213933174	3.16E-04	502	550849	4162699.51
503	550869	4162699.51	REC	1.13E-03	1.58E-03	3.91E-07	1.65E-06	9.68E-09	2.04E-07	2.1E-07	0.213933174	3.16E-04	503	550869	4162699.51
504	550889	4162699.51	REC	1.13E-03	1.59E-03	3.91E-07	1.66E-06	9.68E-09	2.06E-07	2.2E-07	0.215225907	3.18E-04	504	550889	4162699.51
505	550909	4162699.51	REC	1.14E-03	1.61E-03	3.95E-07	1.68E-06	9.77E-09	2.08E-07	2.2E-07	0.217897048	3.22E-04	505	550909	4162699.51

506	550929	4162699.51	REC	1.14E-03	1.61E-03	3.95E-07	1.68E-06	9.77E-09	2.08E-07	2.2E-07	0.217897048	3.22E-04	506	550929	4162699.51
507	550949	4162699.51	REC	1.12E-03	1.58E-03	3.88E-07	1.65E-06	9.60E-09	2.04E-07	2.1E-07	0.213847498	3.16E-04	507	550949	4162699.51
508	550969	4162699.51	REC	1.09E-03	1.54E-03	3.77E-07	1.61E-06	9.34E-09	1.99E-07	2.1E-07	0.208419539	3.08E-04	508	550969	4162699.51
509	550989	4162699.51	REC	1.05E-03	1.49E-03	3.63E-07	1.56E-06	9.00E-09	1.93E-07	2.0E-07	0.201613171	2.98E-04	509	550989	4162699.51
510	551009	4162699.51	REC	1.02E-03	1.44E-03	3.53E-07	1.51E-06	8.74E-09	1.86E-07	1.9E-07	0.194892478	2.88E-04	510	551009	4162699.51
511	551029	4162699.51	REC	9.80E-04	1.39E-03	3.39E-07	1.45E-06	8.40E-09	1.80E-07	1.9E-07	0.18808611	2.78E-04	511	551029	4162699.51
512	551049	4162699.51	REC	9.50E-04	1.34E-03	3.29E-07	1.40E-06	8.14E-09	1.73E-07	1.8E-07	0.181365418	2.68E-04	512	551049	4162699.51
513	551069	4162699.51	REC	9.10E-04	1.29E-03	3.15E-07	1.35E-06	7.80E-09	1.67E-07	1.7E-07	0.17455905	2.58E-04	513	551069	4162699.51
514	551089	4162699.51	REC	8.80E-04	1.24E-03	3.05E-07	1.30E-06	7.54E-09	1.60E-07	1.7E-07	0.167838358	2.48E-04	514	551089	4162699.51
515	551109	4162699.51	REC	8.40E-04	1.18E-03	2.91E-07	1.23E-06	7.20E-09	1.53E-07	1.6E-07	0.159739257	2.36E-04	515	551109	4162699.51
516	550029	4162719.51	RES	7.70E-04	1.09E-03	2.67E-07	1.14E-06	1.05E-08	2.24E-07	2.3E-07	0.234134809	2.18E-04	516	550029	4162719.51
517	550049	4162719.51	RES	8.40E-04	1.18E-03	2.91E-07	1.23E-06	1.14E-08	2.42E-07	2.5E-07	0.253554376	2.36E-04	517	550049	4162719.51
518	550069	4162719.51	RES	9.00E-04	1.27E-03	3.12E-07	1.33E-06	1.22E-08	2.61E-07	2.7E-07	0.27283795	2.54E-04	518	550069	4162719.51
519	550089	4162719.51	RES	9.80E-04	1.38E-03	3.39E-07	1.44E-06	1.33E-08	2.83E-07	3.0E-07	0.296497424	2.76E-04	519	550089	4162719.51
520	550109	4162719.51	RES	1.07E-03	1.51E-03	3.70E-07	1.58E-06	1.46E-08	3.10E-07	3.2E-07	0.324396807	3.02E-04	520	550109	4162719.51
521	550309	4162719.51	RES	4.12E-03	5.89E-03	1.43E-06	6.16E-06	5.60E-08	1.21E-06	1.3E-06	1.264631978	1.18E-03	521	550309	4162719.51
522	550329	4162719.51	RES	4.50E-03	6.43E-03	1.56E-06	6.72E-06	6.12E-08	1.32E-06	1.4E-06	1.380605407	1.29E-03	522	550329	4162719.51
523	550349	4162719.51	RES	4.86E-03	6.95E-03	1.68E-06	7.26E-06	6.61E-08	1.43E-06	1.5E-06	1.492202936	1.39E-03	523	550349	4162719.51
524	550369	4162719.51	RES	5.07E-03	7.25E-03	1.76E-06	7.58E-06	6.89E-08	1.49E-06	1.6E-06	1.556617508	1.45E-03	524	550369	4162719.51
525	550389	4162719.51	RES	5.03E-03	7.19E-03	1.74E-06	7.52E-06	6.84E-08	1.48E-06	1.5E-06	1.543761793	1.44E-03	525	550389	4162719.51
526	550409	4162719.51	RES	4.84E-03	6.90E-03	1.68E-06	7.21E-06	6.58E-08	1.42E-06	1.5E-06	1.481671163	1.38E-03	526	550409	4162719.51
527	550669	4162719.51	RES	1.77E-03	2.45E-03	6.13E-07	2.56E-06	1.52E-08	3.17E-07	3.3E-07	0.331884192	4.90E-04	527	550669	4162719.51
528	550689	4162719.51	RES	1.68E-03	2.33E-03	5.82E-07	2.44E-06	1.44E-08	3.01E-07	3.2E-07	0.315600315	4.66E-04	528	550689	4162719.51
529	550709	4162719.51	RES	1.60E-03	2.22E-03	5.54E-07	2.32E-06	1.37E-08	2.87E-07	3.0E-07	0.300694846	4.44E-04	529	550709	4162719.51
530	550729	4162719.51	RES	1.52E-03	2.12E-03	5.26E-07	2.22E-06	1.30E-08	2.74E-07	2.9E-07	0.28708211	4.24E-04	530	550729	4162719.51
531	550749	4162719.51	RES	1.45E-03	2.03E-03	5.02E-07	2.12E-06	1.24E-08	2.62E-07	2.7E-07	0.274847783	4.06E-04	531	550749	4162719.51
532	550769	4162719.51	RES	1.39E-03	1.95E-03	4.81E-07	2.04E-06	1.19E-08	2.52E-07	2.6E-07	0.263991864	3.90E-04	532	550769	4162719.51
533	550789	4162719.51	RES	1.33E-03	1.87E-03	4.60E-07	1.95E-06	1.14E-08	2.42E-07	2.5E-07	0.253135946	3.74E-04	533	550789	4162719.51
534	550809	4162719.51	RES	1.29E-03	1.81E-03	4.47E-07	1.89E-06	1.11E-08	2.34E-07	2.5E-07	0.245036845	3.62E-04	534	550809	4162719.51
535	550829	4162719.51	RES	1.25E-03	1.76E-03	4.33E-07	1.84E-06	1.07E-08	2.28E-07	2.4E-07	0.238230477	3.52E-04	535	550829	4162719.51
536	550849	4162719.51	RES	1.24E-03	1.74E-03	4.29E-07	1.82E-06	1.06E-08	2.25E-07	2.4E-07	0.235559335	3.48E-04	536	550849	4162719.51
537	550869	4162719.51	RES	1.24E-03	1.74E-03	4.29E-07	1.82E-06	1.06E-08	2.25E-07	2.4E-07	0.235559335	3.48E-04	537	550869	4162719.51
538	550889	4162719.51	RES	1.25E-03	1.76E-03	4.33E-07	1.84E-06	1.07E-08	2.28E-07	2.4E-07	0.238230477	3.52E-04	538	550889	4162719.51
539	550909	4162719.51	RES	1.25E-03	1.76E-03	4.33E-07	1.84E-06	1.07E-08	2.28E-07	2.4E-07	0.238230477	3.52E-04	539	550909	4162719.51
540	550929	4162719.51	RES	1.24E-03	1.74E-03	4.29E-07	1.82E-06	1.06E-08	2.25E-07	2.4E-07	0.235559335	3.48E-04	540	550929	4162719.51
541	550949	4162719.51	RES	1.20E-03	1.69E-03	4.15E-07	1.77E-06	1.03E-08	2.18E-07	2.3E-07	0.228752967	3.38E-04	541	550949	4162719.51
542	550969	4162719.51	RES	1.16E-03	1.64E-03	4.02E-07	1.71E-06	9.94E-09	2.12E-07	2.2E-07	0.221946599	3.28E-04	542	550969	4162719.51
543	550989	4162719.51	RES	1.12E-03	1.58E-03	3.88E-07	1.65E-06	9.60E-09	2.04E-07	2.1E-07	0.213847498	3.16E-04	543	550989	4162719.51
544	551009	4162719.51	RES	1.08E-03	1.52E-03	3.74E-07	1.59E-06	9.25E-09	1.96E-07	2.1E-07	0.205748397	3.04E-04	544	551009	4162719.51
545	551029	4162719.51	RES	1.03E-03	1.46E-03	3.57E-07	1.53E-06	8.82E-09	1.89E-07	2.0E-07	0.19756362	2.92E-04	545	551029	4162719.51
546	551049	4162719.51	RES	9.90E-04	1.40E-03	3.43E-07	1.46E-06	8.48E-09	1.81E-07	1.9E-07	0.189464519	2.80E-04	546	551049	4162719.51
547	551069	4162719.51	RES	9.60E-04	1.35E-03	3.32E-07	1.41E-06	8.22E-09	1.75E-07	1.8E-07	0.182743827	2.70E-04	547	551069	4162719.51
548	551089	4162719.51	RES	9.20E-04	1.30E-03	3.18E-07	1.36E-06	7.88E-09	1.68E-07	1.8E-07	0.175937459	2.60E-04	548	551089	4162719.51
549	551109	4162719.51	RES	8.80E-04	1.24E-03	3.05E-07	1.30E-06	7.54E-09	1.60E-07	1.7E-07	0.167838358	2.48E-04	549	551109	4162719.51
550	550009	4162739.51	RES	7.30E-04	1.02E-03	2.53E-07	1.07E-06	9.93E-09	2.09E-07	2.2E-07	0.219227136	2.04E-04	550	550009	4162739.51
551	550029	4162739.51	RES	7.80E-04	1.10E-03	2.70E-07	1.15E-06	1.06E-08	2.26E-07	2.4E-07	0.236322759	2.20E-04	551	550029	4162739.51
552	550069	4162739.51	RES	9.20E-04	1.29E-03	3.18E-07	1.35E-06	1.25E-08	2.65E-07	2.8E-07	0.277213851	2.58E-04	552	550069	4162739.51
553	550089	4162739.51	RES	9.90E-04	1.40E-03	3.43E-07	1.46E-06	1.35E-08	2.87E-07	3.0E-07	0.300737332	2.80E-04	553	550089	4162739.51
554	550109	4162739.51	RES	1.11E-03	1.57E-03	3.84E-07	1.64E-06	1.51E-08	3.22E-07	3.4E-07	0.337252523	3.14E-04	554	550109	4162739.51
555	550289	4162739.51	RES	4.32E-03	6.18E-03	1.50E-06	6.46E-06	5.87E-08	1.27E-06	1.3E-06	1.3268586	1.24E-03	555	550289	4162739.51
556	550309	4162739.51	RES	4.85E-03	6.94E-03	1.68E-06	7.25E-06	6.60E-08	1.42E-06	1.5E-06	1.490014985	1.39E-03	556	550309	4162739.51
557	550329	4162739.51	RES	5.44E-03	7.79E-03	1.88E-06	8.14E-06	7.40E-08	1.60E-06	1.7E-06	1.672454945	1.56E-03	557	550329	4162739.51
558	550349	4162739.51	RES	5.82E-03	8.33E-03	2.01E-06	8.71E-06	7.91E-08	1.71E-06	1.8E-06	1.788428374	1.67E-03	558	550349	4162739.51
559	550369	4162739.51	RES	6.04E-03	8.65E-03	2.09E-06	9.04E-06	8.21E-08	1.77E-06	1.9E-06	1.857082854	1.73E-03	559	550369	4162739.51
560	550389	4162739.51	RES	6.17E-03	8.83E-03	2.14E-06	9.23E-06	8.39E-08	1.81E-06	1.9E-06	1.895785995	1.77E-03	560	550389	4162739.51
561	550689	4162739.51	RES	1.94E-03	2.69E-03	6.72E-07	2.81E-06	1.66E-08	3.48E-07	3.6E-07	0.364366272	5.38E-04	561	550689	4162739.51
562	550709	4162739.51	RES	1.82E-03	2.54E-03	6.30E-07	2.65E-06	1.56E-08	3.28E-07	3.4E-07	0.343947168	5.08E-04	562	550709	4162739.51
563	550729	4162739.51	RES	1.72E-03	2.40E-03	5.95E-07	2.51E-06	1.47E-08	3.10E-07	3.2E-07	0.324992149	4.80E-04	563	550729	4162739.51
564	550749	4162739.51	RES	1.63E-03	2.28E-03	5.64E-07	2.38E-06	1.40E-08	2.95E-07	3.1E-07	0.308708271	4.56E-04	564	550749	4162739.51
565	550769	4162739.51	RES	1.55E-03	2.16E-03	5.37E-07	2.26E-06	1.33E-08	2.79E-07	2.9E-07	0.292510069	4.32E-04	565	550769	4162739.51
566	550789	4162739.51	RES	1.47E-03	2.07E-03	5.09E-07	2.16E-06	1.26E-08	2.68E-07	2.8E-07	0.280190066	4.14E-04	566	550789	4162739.51
567	550809	4162739.51	RES	1.42E-03	1.98E-03	4.92E-07	2.07E-06	1.22E-08	2.56E-07	2.7E-07	0.26812709	3.96E-04	567	550809	4162739.51
568	550829	4162739.51	RES	1.38E-03	1.93E-03	4.78E-07	2.02E-06	1.18E-08	2.49E-07	2.6E-07	0.261320722	3.86E-04	568	550829	4162739.51
569	550849	4162739.51	RES	1.36E-03	1.91E-03	4.71E-07	2.00E-06	1.17E-08	2.47E-07	2.6E-07	0.258563905	3.82E-04	569	550849	4162739.51
570	550869	4162739.51	RES	1.36E-03	1.92E-03	4.71E-07	2.01E-06	1.17E-08	2.48E-07	2.6E-07	0.259856638	3.84E-04	570	550869	4162739.51
571	550889	4162739.51	RES	1.38E-03	1.94E-03	4.78E-07	2.03E-06	1.18E-08	2.51E-07	2.6E-07	0.262613455	3.88E-04	571	550889	4162739.51
572	550909	4162739.51	RES	1.36E-03	1.92E-03	4.71E-07	2.01E-06	1.17E-08	2.48E-07	2.6E-07	0.259856638	3.84E-04	572	550909	4162739.51
573	550929	4162739.51	RES	1.33E-03	1.87E-03	4.60E-07	1.95E-06	1.14E-08	2.42E-07	2.5E-07	0.253135946	3.74E-04	573	550929	4162739.51
574	550949	4162739.51	RES	1.27E-03	1.80E-03	4.40E-07	1.88E-06	1.09E-08	2.33E-07	2.4E-07	0.24357276	3.60E-04	574	550949	4162739.51
575	550969	4162739.51	RES	1.23E-03	1.73E-03	4.26E-07	1.81E-06	1.05E-08	2.24E-07	2.3E-07	0.234180926	3.46E-04	575	550969	4162739.51
576	550989	4162739.51	RES	1.18E-03	1.67E-03	4.08E-07	1.75E-06	1.01E-08	2.16E-07	2.3E-07	0.225996149	3.34E-04	576	550989	4162739.51
577	551009	4162739.51	RES	1.13E-03	1.60E-03	3.91E-07	1.67E-06	9.68E-09	2.07E-07	2.2E-07	0.21651864	3.20E-04	577	551009	4162739.51
578	551029	4162739.51	RES	1.09E-03	1.53E-03	3.77E-07	1.60E-06	9.34E-09	1.98E-07	2.1E-07	0.207126806	3.06E-04	578	551029	4162739.51
579	551049	4162739.51	RES	1.04E-03	1.47E-03	3.60E-07	1.54E-06	8.91E-09	1.90E-07	2.0E-07	0.198942029	2.94E-04	579	551049	4162739.51
580	551069	4162739.51	RES	1.00E-03	1.41E-03	3.46E-07	1.47E-06	8.57E-09	1.82E-07	1.9E-07	0.190842928	2.82E-04	580	551069	4162739.51
581	551089	4162739.51	RES	9.60E-04	1.36E-03	3.32E-07	1.42E-06	8.22E-09	1.76E-07	1.8E-07	0.18403656	2.72E-04	581	551089	4162739.51
582	551109	4162739.51	RES	9.10E-04	1.29E-03	3.15E-07	1.35E-06	7.80E-09	1.67E-07	1.7E-07	0.17455905	2.58E-04	582	551109	4162739.51
583	549989	4162759.51	RES	6.90E-04	9.60E-04	2.39E-07	1.00E-06	9.38E-09	1.97E-07	2.1E-07	0.20637142	1.92E-04	583	549989	4162759.51
584	550009	4162759.51	RES	7.30E-04	1.03E-03	2.53E-07	1.08E-06	9.93E-09	2.11E-07	2.2E-07	0.221279093	2.06E-04	584	550009	4162759.51
585	550029	4162759.51	RES	7.90E-04	1.11E-03	2.73E-07	1.16E-06	1.07E-08	2.28E-07	2.4E-07	0.23851071	2.22E-04	585	550029	4162759.51
586	550049	4162759.51	RES	8.60E-04	1.21E-03	2.98E-07	1.26E-06	1.17E-08	2.48E-07	2.6E-07	0.259982234	2.42E-04	586	550049	4162759.51
587	550069	4162759.51	RES	9.30E-04	1.31E-03	3.22E-07	1.37E-06	1.26E-08	2.69E-07	2.8E-07	0.281453758	2.62E-04	587	550069	4162759.51
588	550269	4162759.51	RES	4.34E-03	6.20E-03	1.50E-06	6.48E-06	5.90E-08	1.27E-06	1.3E-06	1.331234501	1.24E-03	588	550269	4162759.51
589	550289	4162759.51	RES	4.97E-03	7.11E-03	1.72E-06	7.43E-06	6.76E-08	1.46E-06	1.5E-06	1.526530176	1.42E-03	589	550289	4162759.51
590	550309	4162759.51	RES	5.72E-03	8.19E-03	1.98E-06	8.56E-06	7.78E-08	1.68E-06	1.8E-06	1.758341041	1.64E-03	590	550309	4162759.51
591	550329	4162759.51	RES	6.44E-03	9.23E-03	2.23E-06	9.65E-06	8.76E-08	1.89E-06	2.0E-06	1.981536099	1.85E-03	591	550329	4162759.51
592	550349	4162759.51	RES	7.01E-03	1.00E-02	2.43E-06	1.05E-05	9.53E-08	2.06E-06	2.2E-06	2.155496243	2.01E-03	592	550349	4162759.51
593	550369	4162759.51	RES	7.34E-03	1.05E-02	2.54E-06	1.10E-05	9.98E-08	2.16E-06	2.3E-06	2.258477963	2.10E-03	593	550369	4162759.51
594	550689	4162759.51	RES	2.21E-03	3.08E-03	7.65E-07	3.22E-06	1.89E-08	3.98E-07	4.2E-07	0.417096104	6.16E-04	594	550689	4162759.51
595	550709	4162759.51	RES	2.06E-03	2.87E-03	7.13E-07	3.00E-06	1.76E-08	3.71E-07	3.9E-07	0.388663575	5.74E-04	595	550709	4162759.51
596	550729	4162759.51	RES	1.92E-03	2.69E-03	6.65E-07	2.81E-06	1.64E-08	3.48E-07	3.6E-07	0.364194921	5.38E-04	596	550729	4162759.51
597	550749	4162759.51	RES	1.81E-03	2.53E-03	6.27E-07	2.64E-06	1.55E-08	3.27E-07	3.4E-07	0.34256876	5.06E-04	597	550749	4162759.51
598	550769	4162759.51	RES	1.70E-03	2.39E-03	5.88E-07	2.50E-06	1.46E-08	3.09E-07	3.2E-07	0.323528064	4.78E-04	598	550769	4162759.51
599	550789	4162759.51	RES	1.62E-03	2.27E-03	5.61E-07	2.37E-06	1.39E-08	2.93E-07	3.1E-07	0.307329862	4.54E-04	599	550789	4162759.51
600	550809	4162759.51	RES	1.55E-03	2.17E-03	5.37E-07	2.27E-06	1.33E-08	2.81E-07	2.9E-07	0.293802802	4.34E-04	600	550809	4162759.51
601	550829	4162759.51	RES	1.51E-03	2.12E-03	5.23E-07	2.22E-06	1.29E-08	2.74E-07	2.9E-07	0.286996434	4.24E-04	601	550829	4162759.51
602	550849	4162759.51	RES	1.50E-03	2.10E-03	5.19E-07	2.19E-06	1.29E-08	2.71E-07	2.8E-07	0.284325292	4.20E-04	602	550849	4162759.51
603	550869	4162759.51	RES	1.50E-03	2.11E-03	5.19E-07	2.21E-06	1.29E-08	2.73E-07	2.9E-07	0.285618025	4.22E-04	603	550869	4162759.51
604	550889	4162759.51	RES	1.49E-03	2.11E-03	5.16E-07	2.21E-06	1.28E-08	2.73E-07	2.9E-07	0.28553235	4.22E-04	604	550889	4162759.51
605	550909	4162759.51	RES	1.46E-03	2.06E-03	5.05E-07	2.15E-06	1.25E-08	2.66E-07	2.8E-07	0.278811657	4.12E-04	605	550909	4162759.51
606	550929	4162759.51	RES	1.41E-03	1.98E-03	4.88E-07	2.07E-06	1.21E-08	2.56E-07	2.7E-07	0.268041415	3.96E-04	606	550929	4162759.51
607	550949	4162759.51	RES	1.35E-03	1.90E-03	4.67E-07	1.99E-06	1.16E-08	2.46E-07	2.6E-07	0.257185496	3.80E-04	607	550949	4162759.51
608	550969	4162759.51	RES	1.29E-03	1.83E-03	4.47E-07	1.91E-06	1.11E-08	2.37E-07	2.5E-07	0.247622311	3.66E-04	608	550969	4162759.51
609	550989	4162759.51	RES	1.24E-03	1.75E-03	4.29E-07	1.83E-06	1.06E-08	2.26E-07	2.4E-07	0.236852068	3.50E-04	609	550989	4162759.51
610	551009	4162759.51	RES	1.19E-03	1.68E-03	4.12E-07	1.76E-06	1.02E-08	2.17E-07	2.3E-07	0.227374558	3.36E-04	610	551009	4162759.51
611	551029	4162759.51	RES	1.14E-03	1.61E-03	3.95E-07	1.68E-06	9.77E-09	2.08E-07	2.2E-07	0.217897048	3.22E-04	611	551029	4162759.51
612	551049	4162759.51	RES	1.09E-03	1.54E-03	3.77E-07	1.61E-06	9.34E-09	1.99E-07	2.1E-07	0.208419539	3.08E-04	612	551049	4162759.51
613	551069	4162759.51	RES	1.05E-03	1.48E-03	3.63E-07	1.55E-06	9.00E-09	1.91E-07	2.0E-07	0.200320438	2.96E-04	613	551069	4162759.51
614	551089	4162759.51	RES	1.00E-03	1.40E-03	3.46E-07	1.46E-06	8.57E-09	1.81E-07	1.9E-07	0.189550195	2.80E-04	614	551089	4162759.51
615	551109	4162759.51	RES	9.50E-04	1.33E-03	3.29E-07	1.39E-06	8.14E-09	1.72E-07	1.8E-07	0.180072685	2.66E-04	615	551109	4162759.51
616	549969	4162779.51	RES	6.50E-04	9.10E-04	2.25E-07	9.51E-07	8.84E-09	1.87E-07	2.0E-07	0.195567661	1.82E-04	616	549969	4162779.51
617	549989	4162779.51	RES	6.90E-04	9.70E-04	2.39E-07	1.01E-06	9.38E-09	1.99E-07	2.1E-07	0.208423377	1.94E-04	617	549989	4162779.51
618	550009	4162779.51	RES	7.40E-04	1.04E-03	2.56E-07	1.09E-06	1.01E-08	2.13E-07	2.2E-07	0.223467044	2.08E-04	618	550009	4162779.51
619	550029	4162779.51	RES	8.00E-04	1.12E-03	2.77E-07	1.17E-06	1.09E-08	2.30E-07	2.4E-07	0.24069866	2.24E-04	619	550029	4162779.51
620	550049	4162779.51	RES	8.60E-04	1.21E-03	2.98E-07	1.26E-06	1.17E-08	2.48E-07	2.6E-07	0.259982234	2.42E-04	620	550049	4162779.51
621	550069	4162779.51	RES	9.40E-04	1.32E-03	3.25E-07	1.38E-06	1.28E-08	2.71E-07	2.8E-07	0.283641709	2.64E-04	621	550069	4162779.51
622	550249	4162779.51	RES	4.20E-03	6.01E-03	1.45E-06	6.28E-06	5.71E-08	1.23E-06	1.3E-06	1.29034341	1.20E-03	622	550249	4162779.51
623	550269	4162779.51	RES	4.94E-03	7.08E-03	1.71E-06	7.40E-06	6.72E-08	1.45E-06	1.5E-06	1.519966325	1.42E-03	623	550269	4162779.51
624	550289	4162779.51	RES	5.70E-03	8.16E-03	1.97E-06	8.53E-06	7.75E-08	1.67E-06	1.8E-06	1.751913184	1.63E-03	624	550289	4162779.51
625	550309	4162779.51	RES	6.55E-03	9.39E-03	2.27E-06	9.81E-06	8.91E-08	1.93E-06	2.0E-06	2.015863339	1.88E-03	625	550309	4162779.51
626	550329	4162779.51	RES	7.54E-03	1.08E-02	2.61E-06	1.13E-05	1.03E-07	2.22E-06	2.3E-06	2.322756543	2.16E-03	626	550329	4162779.51
627	550349	4162779.51	RES	8.53E-03	1.22E-02	2.95E-06	1.28E-05	1.16E-07	2.51E-06	2.6E-06	2.625545832	2.45E-03	627	550349	4162779.51
628	550709	4162779.51	RES	2.31E-03	3.22E-03	8.00E-07	3.37E-06	1.98E-08	4.16E-07	4.4E-07	0.436051124	6.44E-04	628	550709	4162779.51
629	550729	4162779.51	RES	2.14E-03	2.99E-03	7.41E-07	3.13E-06	1.83E-08	3.87E-07	4.0E-07	0.404861777	5.98E-04	629	550729	4162779.51
630	550749	4162779.51	RES	1.99E-03	2.79E-03	6.89E-07	2.92E-06	1.70E-08	3.61E-07	3.8E-07	0.377721981	5.58E-04	630	550749	4162779.51
631	550769	4162779.51	RES	1.86E-03	2.61E-03	6.44E-07	2.73E-06	1.59E-08	3.37E-07	3.5E-07	0.353339002	5.22E-04	631	550769	4162779.51
632	550789	4162779.51	RES	1.76E-03	2.47E-03	6.09E-07	2.58E-06	1.51E-08	3.19E-07	3.3E-07	0.334383983	4.94E-04	632	550789	4162779.51
633	550809	4162779.51	REC	1.68E-03	2.36E-03	5.82E-07	2.47E-06	1.44E-08	3.05E-07	3.2E-07	0.319478514	4.72E-04	633	550809	4162779.51

634	550829	4162779.51	REC	1.64E-03	2.30E-03	5.68E-07	2.40E-06	1.41E-08	2.97E-07	3.1E-07	0.311379413	4.60E-04	634	550829	4162779.51
635	550849	4162779.51	REC	1.63E-03	2.29E-03	5.64E-07	2.39E-06	1.40E-08	2.96E-07	3.1E-07	0.310001004	4.58E-04	635	550849	4162779.51
636	550869	4162779.51	REC	1.62E-03	2.28E-03	5.61E-07	2.38E-06	1.39E-08	2.95E-07	3.1E-07	0.308622595	4.56E-04	636	550869	4162779.51
637	550889	4162779.51	REC	1.60E-03	2.25E-03	5.54E-07	2.35E-06	1.37E-08	2.91E-07	3.0E-07	0.304573045	4.50E-04	637	550889	4162779.51
638	550909	4162779.51	REC	1.54E-03	2.18E-03	5.33E-07	2.28E-06	1.32E-08	2.82E-07	3.0E-07	0.295009859	4.36E-04	638	550909	4162779.51
639	550929	4162779.51	REC	1.48E-03	2.09E-03	5.12E-07	2.18E-06	1.27E-08	2.70E-07	2.8E-07	0.282861208	4.18E-04	639	550929	4162779.51
640	550949	4162779.51	REC	1.42E-03	2.00E-03	4.92E-07	2.09E-06	1.22E-08	2.59E-07	2.7E-07	0.270712556	4.00E-04	640	550949	4162779.51
641	550969	4162779.51	REC	1.36E-03	1.92E-03	4.71E-07	2.01E-06	1.17E-08	2.48E-07	2.6E-07	0.259856638	3.84E-04	641	550969	4162779.51
642	550989	4162779.51	REC	1.30E-03	1.84E-03	4.50E-07	1.92E-06	1.11E-08	2.38E-07	2.5E-07	0.249000719	3.68E-04	642	550989	4162779.51
643	551009	4162779.51	REC	1.25E-03	1.76E-03	4.33E-07	1.84E-06	1.07E-08	2.28E-07	2.4E-07	0.238230477	3.52E-04	643	551009	4162779.51
644	551029	4162779.51	REC	1.19E-03	1.67E-03	4.12E-07	1.75E-06	1.02E-08	2.16E-07	2.3E-07	0.226081825	3.34E-04	644	551029	4162779.51
645	551049	4162779.51	REC	1.14E-03	1.60E-03	3.95E-07	1.67E-06	9.77E-09	2.07E-07	2.2E-07	0.216604315	3.20E-04	645	551049	4162779.51
646	551069	4162779.51	REC	1.08E-03	1.52E-03	3.74E-07	1.59E-06	9.25E-09	1.96E-07	2.1E-07	0.205748397	3.04E-04	646	551069	4162779.51
647	551089	4162779.51	REC	1.03E-03	1.44E-03	3.57E-07	1.51E-06	8.82E-09	1.86E-07	1.9E-07	0.194978154	2.88E-04	647	551089	4162779.51
648	551109	4162779.51	REC	9.70E-04	1.36E-03	3.36E-07	1.42E-06	8.31E-09	1.76E-07	1.8E-07	0.184122236	2.72E-04	648	551109	4162779.51
649	549949	4162799.51	RES	6.00E-04	8.50E-04	2.08E-07	8.88E-07	8.16E-09	1.74E-07	1.8E-07	0.182575952	1.70E-04	649	549949	4162799.51
650	549989	4162799.51	RES	6.90E-04	9.70E-04	2.39E-07	1.01E-06	9.38E-09	1.99E-07	2.1E-07	0.208423377	1.94E-04	650	549989	4162799.51
651	550009	4162799.51	RES	7.40E-04	1.04E-03	2.56E-07	1.09E-06	1.01E-08	2.13E-07	2.2E-07	0.223467044	2.08E-04	651	550009	4162799.51
652	550049	4162799.51	RES	8.70E-04	1.22E-03	3.01E-07	1.28E-06	1.18E-08	2.50E-07	2.6E-07	0.262170184	2.44E-04	652	550049	4162799.51
653	550069	4162799.51	RES	9.40E-04	1.33E-03	3.25E-07	1.39E-06	1.28E-08	2.73E-07	2.9E-07	0.285693666	2.66E-04	653	550069	4162799.51
654	550229	4162799.51	RES	3.67E-03	5.25E-03	1.27E-06	5.49E-06	4.99E-08	1.08E-06	1.1E-06	1.127187024	1.05E-03	654	550229	4162799.51
655	550249	4162799.51	RES	4.40E-03	6.29E-03	1.52E-06	6.57E-06	5.98E-08	1.29E-06	1.4E-06	1.350518075	1.26E-03	655	550249	4162799.51
656	550269	4162799.51	RES	5.36E-03	7.68E-03	1.86E-06	8.03E-06	7.29E-08	1.58E-06	1.6E-06	1.64879547	1.54E-03	656	550269	4162799.51
657	550289	4162799.51	RES	6.32E-03	9.05E-03	2.19E-06	9.46E-06	8.59E-08	1.86E-06	1.9E-06	1.942968951	1.81E-03	657	550289	4162799.51
658	550309	4162799.51	RES	7.46E-03	1.07E-02	2.58E-06	1.12E-05	1.01E-07	2.19E-06	2.3E-06	2.294993153	2.14E-03	658	550309	4162799.51
659	550329	4162799.51	RES	8.78E-03	1.26E-02	3.04E-06	1.32E-05	1.19E-07	2.59E-06	2.7E-06	2.704868078	2.52E-03	659	550329	4162799.51
660	550709	4162799.51	RES	2.56E-03	3.58E-03	8.86E-07	3.74E-06	2.19E-08	4.63E-07	4.8E-07	0.484731406	7.16E-04	660	550709	4162799.51
661	550729	4162799.51	RES	2.35E-03	3.30E-03	8.13E-07	3.45E-06	2.01E-08	4.27E-07	4.5E-07	0.446735691	6.60E-04	661	550729	4162799.51
662	550749	4162799.51	RES	2.17E-03	3.05E-03	7.51E-07	3.19E-06	1.86E-08	3.94E-07	4.1E-07	0.412875203	6.10E-04	662	550749	4162799.51
663	550769	4162799.51	RES	2.02E-03	2.83E-03	6.99E-07	2.96E-06	1.73E-08	3.66E-07	3.8E-07	0.38314994	5.66E-04	663	550769	4162799.51
664	550789	4162799.51	RES	1.89E-03	2.65E-03	6.54E-07	2.77E-06	1.62E-08	3.43E-07	3.6E-07	0.358766962	5.30E-04	664	550789	4162799.51
665	550809	4162799.51	RES	1.80E-03	2.53E-03	6.23E-07	2.64E-06	1.54E-08	3.27E-07	3.4E-07	0.342483084	5.06E-04	665	550809	4162799.51
666	550829	4162799.51	RES	1.75E-03	2.46E-03	6.06E-07	2.57E-06	1.50E-08	3.18E-07	3.3E-07	0.333005574	4.92E-04	666	550829	4162799.51
667	550849	4162799.51	RES	1.74E-03	2.44E-03	6.02E-07	2.55E-06	1.49E-08	3.15E-07	3.3E-07	0.330334432	4.88E-04	667	550849	4162799.51
668	550869	4162799.51	RES	1.72E-03	2.43E-03	5.95E-07	2.54E-06	1.47E-08	3.14E-07	3.3E-07	0.328870348	4.86E-04	668	550869	4162799.51
669	550889	4162799.51	RES	1.70E-03	2.39E-03	5.88E-07	2.50E-06	1.46E-08	3.09E-07	3.2E-07	0.323528064	4.78E-04	669	550889	4162799.51
670	550909	4162799.51	RES	1.62E-03	2.28E-03	5.61E-07	2.38E-06	1.39E-08	2.95E-07	3.1E-07	0.308622595	4.56E-04	670	550909	4162799.51
671	550929	4162799.51	RES	1.55E-03	2.19E-03	5.37E-07	2.29E-06	1.33E-08	2.83E-07	3.0E-07	0.296388268	4.38E-04	671	550929	4162799.51
672	550949	4162799.51	RES	1.49E-03	2.10E-03	5.16E-07	2.19E-06	1.28E-08	2.71E-07	2.8E-07	0.284239617	4.20E-04	672	550949	4162799.51
673	550969	4162799.51	RES	1.43E-03	2.01E-03	4.95E-07	2.10E-06	1.23E-08	2.60E-07	2.7E-07	0.272090965	4.02E-04	673	550969	4162799.51
674	550989	4162799.51	RES	1.36E-03	1.92E-03	4.71E-07	2.01E-06	1.17E-08	2.48E-07	2.6E-07	0.259856638	3.84E-04	674	550989	4162799.51
675	551009	4162799.51	RES	1.30E-03	1.82E-03	4.50E-07	1.90E-06	1.11E-08	2.35E-07	2.5E-07	0.246415253	3.64E-04	675	551009	4162799.51
676	551029	4162799.51	RES	1.23E-03	1.74E-03	4.26E-07	1.82E-06	1.05E-08	2.25E-07	2.4E-07	0.235473659	3.48E-04	676	551029	4162799.51
677	551049	4162799.51	RES	1.17E-03	1.65E-03	4.05E-07	1.72E-06	1.00E-08	2.13E-07	2.2E-07	0.223325008	3.30E-04	677	551049	4162799.51
678	551069	4162799.51	RES	1.11E-03	1.56E-03	3.84E-07	1.63E-06	9.51E-09	2.02E-07	2.1E-07	0.211176356	3.12E-04	678	551069	4162799.51
679	551089	4162799.51	RES	1.04E-03	1.47E-03	3.60E-07	1.54E-06	8.91E-09	1.90E-07	2.0E-07	0.198942029	2.94E-04	679	551089	4162799.51
680	551109	4162799.51	RES	9.80E-04	1.38E-03	3.39E-07	1.44E-06	8.40E-09	1.78E-07	1.9E-07	0.186793377	2.76E-04	680	551109	4162799.51
681	549929	4162819.51	RES	5.60E-04	7.90E-04	1.94E-07	8.26E-07	7.62E-09	1.62E-07	1.7E-07	0.169720236	1.58E-04	681	549929	4162819.51
682	549949	4162819.51	RES	6.00E-04	8.40E-04	2.08E-07	8.78E-07	8.16E-09	1.72E-07	1.8E-07	0.180523995	1.68E-04	682	549949	4162819.51
683	549969	4162819.51	RES	6.40E-04	9.00E-04	2.22E-07	9.41E-07	8.70E-09	1.85E-07	1.9E-07	0.193379711	1.80E-04	683	549969	4162819.51
684	549989	4162819.51	RES	6.90E-04	9.70E-04	2.39E-07	1.01E-06	9.38E-09	1.99E-07	2.1E-07	0.208423377	1.94E-04	684	549989	4162819.51
685	550029	4162819.51	RES	8.00E-04	1.13E-03	2.77E-07	1.18E-06	1.09E-08	2.32E-07	2.4E-07	0.242750617	2.26E-04	685	550029	4162819.51
686	550049	4162819.51	RES	8.70E-04	1.22E-03	3.01E-07	1.28E-06	1.18E-08	2.50E-07	2.6E-07	0.262170184	2.44E-04	686	550049	4162819.51
687	550069	4162819.51	RES	9.60E-04	1.35E-03	3.32E-07	1.41E-06	1.31E-08	2.77E-07	2.9E-07	0.290069567	2.70E-04	687	550069	4162819.51
688	550209	4162819.51	RES	3.15E-03	4.49E-03	1.09E-06	4.69E-06	4.28E-08	9.21E-07	9.6E-07	0.964166632	8.98E-04	688	550209	4162819.51
689	550229	4162819.51	RES	3.73E-03	5.32E-03	1.29E-06	5.56E-06	5.07E-08	1.09E-06	1.1E-06	1.142366684	1.06E-03	689	550229	4162819.51
690	550249	4162819.51	RES	4.49E-03	6.42E-03	1.55E-06	6.71E-06	6.11E-08	1.32E-06	1.4E-06	1.378417457	1.28E-03	690	550249	4162819.51
691	550269	4162819.51	RES	5.55E-03	7.94E-03	1.92E-06	8.30E-06	7.55E-08	1.63E-06	1.7E-06	1.704730228	1.59E-03	691	550269	4162819.51
692	550289	4162819.51	RES	7.02E-03	1.01E-02	2.43E-06	1.05E-05	9.55E-08	2.06E-06	2.2E-06	2.15973615	2.01E-03	692	550289	4162819.51
693	550729	4162819.51	RES	2.57E-03	3.60E-03	8.90E-07	3.76E-06	2.20E-08	4.65E-07	4.9E-07	0.487402547	7.20E-04	693	550729	4162819.51
694	550749	4162819.51	RES	2.36E-03	3.30E-03	8.17E-07	3.45E-06	2.02E-08	4.27E-07	4.5E-07	0.446821367	6.60E-04	694	550749	4162819.51
695	550769	4162819.51	RES	2.17E-03	3.05E-03	7.51E-07	3.19E-06	1.86E-08	3.94E-07	4.1E-07	0.412875203	6.10E-04	695	550769	4162819.51
696	550789	4162819.51	RES	2.02E-03	2.84E-03	6.99E-07	2.97E-06	1.73E-08	3.67E-07	3.8E-07	0.384442673	5.68E-04	696	550789	4162819.51
697	550809	4162819.51	RES	1.91E-03	2.67E-03	6.61E-07	2.79E-06	1.64E-08	3.45E-07	3.6E-07	0.361523779	5.34E-04	697	550809	4162819.51
698	550829	4162819.51	RES	1.84E-03	2.58E-03	6.37E-07	2.70E-06	1.58E-08	3.34E-07	3.5E-07	0.349289452	5.16E-04	698	550829	4162819.51
699	550849	4162819.51	RES	1.82E-03	2.55E-03	6.30E-07	2.67E-06	1.56E-08	3.30E-07	3.5E-07	0.345239901	5.10E-04	699	550849	4162819.51
700	550869	4162819.51	RES	1.79E-03	2.52E-03	6.20E-07	2.63E-06	1.53E-08	3.26E-07	3.4E-07	0.341104675	5.04E-04	700	550869	4162819.51
701	550889	4162819.51	RES	1.74E-03	2.45E-03	6.02E-07	2.56E-06	1.49E-08	3.17E-07	3.3E-07	0.331627165	4.90E-04	701	550889	4162819.51
702	550909	4162819.51	RES	1.67E-03	2.35E-03	5.78E-07	2.46E-06	1.43E-08	3.04E-07	3.2E-07	0.318100105	4.70E-04	702	550909	4162819.51
703	550929	4162819.51	RES	1.61E-03	2.26E-03	5.57E-07	2.36E-06	1.38E-08	2.92E-07	3.1E-07	0.305951454	4.52E-04	703	550929	4162819.51
704	550949	4162819.51	RES	1.55E-03	2.18E-03	5.37E-07	2.28E-06	1.33E-08	2.82E-07	3.0E-07	0.295095535	4.36E-04	704	550949	4162819.51
705	550969	4162819.51	RES	1.49E-03	2.10E-03	5.16E-07	2.19E-06	1.28E-08	2.71E-07	2.8E-07	0.284239617	4.20E-04	705	550969	4162819.51
706	550989	4162819.51	RES	1.41E-03	1.98E-03	4.88E-07	2.07E-06	1.21E-08	2.56E-07	2.7E-07	0.268041415	3.96E-04	706	550989	4162819.51
707	551009	4162819.51	RES	1.34E-03	1.88E-03	4.64E-07	1.96E-06	1.15E-08	2.43E-07	2.5E-07	0.254514354	3.76E-04	707	551009	4162819.51
708	551029	4162819.51	RES	1.27E-03	1.78E-03	4.40E-07	1.86E-06	1.09E-08	2.30E-07	2.4E-07	0.240987294	3.56E-04	708	551029	4162819.51
709	551049	4162819.51	RES	1.20E-03	1.68E-03	4.15E-07	1.76E-06	1.03E-08	2.17E-07	2.3E-07	0.227460234	3.36E-04	709	551049	4162819.51
710	551069	4162819.51	RES	1.13E-03	1.58E-03	3.91E-07	1.65E-06	9.68E-09	2.04E-07	2.1E-07	0.213933174	3.16E-04	710	551069	4162819.51
711	551089	4162819.51	RES	1.06E-03	1.48E-03	3.67E-07	1.55E-06	9.08E-09	1.91E-07	2.0E-07	0.200406113	2.96E-04	711	551089	4162819.51
712	551109	4162819.51	RES	1.00E-03	1.41E-03	3.46E-07	1.47E-06	8.57E-09	1.82E-07	1.9E-07	0.190842928	2.82E-04	712	551109	4162819.51
713	549929	4162839.51	RES	5.60E-04	7.90E-04	1.94E-07	8.26E-07	7.62E-09	1.62E-07	1.7E-07	0.169720236	1.58E-04	713	549929	4162839.51
714	549949	4162839.51	RES	6.00E-04	8.40E-04	2.08E-07	8.78E-07	8.16E-09	1.72E-07	1.8E-07	0.180523995	1.68E-04	714	549949	4162839.51
715	549969	4162839.51	RES	6.40E-04	9.00E-04	2.22E-07	9.41E-07	8.70E-09	1.85E-07	1.9E-07	0.193379711	1.80E-04	715	549969	4162839.51
716	550009	4162839.51	RES	7.40E-04	1.04E-03	2.56E-07	1.09E-06	1.01E-08	2.13E-07	2.2E-07	0.223467044	2.08E-04	716	550009	4162839.51
717	550049	4162839.51	RES	8.80E-04	1.24E-03	3.05E-07	1.30E-06	1.20E-08	2.54E-07	2.7E-07	0.266410092	2.48E-04	717	550049	4162839.51
718	550069	4162839.51	RES	9.60E-04	1.35E-03	3.32E-07	1.41E-06	1.31E-08	2.77E-07	2.9E-07	0.290069567	2.70E-04	718	550069	4162839.51
719	550089	4162839.51	RES	1.06E-03	1.49E-03	3.67E-07	1.56E-06	1.44E-08	3.06E-07	3.2E-07	0.320156899	2.98E-04	719	550089	4162839.51
720	550209	4162839.51	RES	3.15E-03	4.49E-03	1.09E-06	4.69E-06	4.28E-08	9.21E-07	9.6E-07	0.964166632	8.98E-04	720	550209	4162839.51
721	550229	4162839.51	RES	3.70E-03	5.28E-03	1.28E-06	5.52E-06	5.03E-08	1.08E-06	1.1E-06	1.133750875	1.06E-03	721	550229	4162839.51
722	550249	4162839.51	RES	4.47E-03	6.39E-03	1.55E-06	6.68E-06	6.08E-08	1.31E-06	1.4E-06	1.371989599	1.28E-03	722	550249	4162839.51
723	550269	4162839.51	RES	5.54E-03	7.93E-03	1.92E-06	8.29E-06	7.53E-08	1.63E-06	1.7E-06	1.702542277	1.59E-03	723	550269	4162839.51
724	550729	4162839.51	RES	2.78E-03	3.88E-03	9.62E-07	4.06E-06	2.38E-08	5.02E-07	5.3E-07	0.525398262	7.76E-04	724	550729	4162839.51
725	550749	4162839.51	RES	2.53E-03	3.55E-03	8.76E-07	3.71E-06	2.17E-08	4.59E-07	4.8E-07	0.480596179	7.10E-04	725	550749	4162839.51
726	550769	4162839.51	RES	2.32E-03	3.26E-03	8.03E-07	3.41E-06	1.99E-08	4.21E-07	4.4E-07	0.441307732	6.52E-04	726	550769	4162839.51
727	550789	4162839.51	RES	2.15E-03	3.02E-03	7.44E-07	3.16E-06	1.84E-08	3.90E-07	4.1E-07	0.408825652	6.04E-04	727	550789	4162839.51
728	550809	4162839.51	RES	2.02E-03	2.83E-03	6.99E-07	2.96E-06	1.73E-08	3.66E-07	3.8E-07	0.38314994	5.66E-04	728	550809	4162839.51
729	550829	4162839.51	RES	1.92E-03	2.69E-03	6.65E-07	2.81E-06	1.64E-08	3.48E-07	3.6E-07	0.364194921	5.38E-04	729	550829	4162839.51
730	550849	4162839.51	RES	1.85E-03	2.60E-03	6.40E-07	2.72E-06	1.59E-08	3.36E-07	3.5E-07	0.351960594	5.20E-04	730	550849	4162839.51
731	550869	4162839.51	RES	1.80E-03	2.52E-03	6.23E-07	2.63E-06	1.54E-08	3.26E-07	3.4E-07	0.341190351	5.04E-04	731	550869	4162839.51
732	550889	4162839.51	RES	1.75E-03	2.45E-03	6.06E-07	2.56E-06	1.50E-08	3.17E-07	3.3E-07	0.331712841	4.90E-04	732	550889	4162839.51
733	550909	4162839.51	RES	1.70E-03	2.39E-03	5.88E-07	2.50E-06	1.46E-08	3.09E-07	3.2E-07	0.323528064	4.78E-04	733	550909	4162839.51
734	550929	4162839.51	RES	1.64E-03	2.31E-03	5.68E-07	2.41E-06	1.41E-08	2.99E-07	3.1E-07	0.312672146	4.62E-04	734	550929	4162839.51
735	550949	4162839.51	RES	1.58E-03	2.22E-03	5.47E-07	2.32E-06	1.35E-08	2.87E-07	3.0E-07	0.300523494	4.44E-04	735	550949	4162839.51
736	550969	4162839.51	RES	1.53E-03	2.15E-03	5.30E-07	2.25E-06	1.31E-08	2.78E-07	2.9E-07	0.291045985	4.30E-04	736	550969	4162839.51
737	550989	4162839.51	RES	1.44E-03	2.02E-03	4.98E-07	2.11E-06	1.23E-08	2.61E-07	2.7E-07	0.273469374	4.04E-04	737	550989	4162839.51
738	551009	4162839.51	RES	1.37E-03	1.92E-03	4.74E-07	2.01E-06	1.17E-08	2.48E-07	2.6E-07	0.259942314	3.84E-04	738	551009	4162839.51
739	551029	4162839.51	RES	1.29E-03	1.81E-03	4.47E-07	1.89E-06	1.11E-08	2.34E-07	2.5E-07	0.245036845	3.62E-04	739	551029	4162839.51
740	551049	4162839.51	RES	1.22E-03	1.71E-03	4.22E-07	1.79E-06	1.05E-08	2.21E-07	2.3E-07	0.231509784	3.42E-04	740	551049	4162839.51
741	551069	4162839.51	RES	1.14E-03	1.60E-03	3.95E-07	1.67E-06	9.77E-09	2.07E-07	2.2E-07	0.216604315	3.20E-04	741	551069	4162839.51
742	551089	4162839.51	RES	1.07E-03	1.50E-03	3.70E-07	1.57E-06	9.17E-09	1.94E-07	2.0E-07	0.203077255	3.00E-04	742	551089	4162839.51
743	551109	4162839.51	RES	1.01E-03	1.41E-03	3.50E-07	1.47E-06	8.65E-09	1.82E-07	1.9E-07	0.190928604	2.82E-04	743	551109	4162839.51
744	549909	4162859.51	RES	5.20E-04	7.30E-04	1.80E-07	7.63E-07	7.07E-09	1.50E-07	1.6E-07	0.156864521	1.46E-04	744	549909	4162859.51
745	549929	4162859.51	RES	5.50E-04	7.80E-04	1.90E-07	8.15E-07	7.48E-09	1.60E-07	1.7E-07	0.167532286	1.56E-04	745	549929	4162859.51
746	549949	4162859.51	RES	5.90E-04	8.30E-04	2.04E-07	8.68E-07	8.02E-09	1.70E-07	1.8E-07	0.178336045	1.66E-04	746	549949	4162859.51
747	549969	4162859.51	RES	6.40E-04	8.90E-04	2.22E-07	9.30E-07	8.70E-09	1.83E-07	1.9E-07	0.191327754	1.78E-04	747	549969	4162859.51
748	549989	4162859.51	RES	6.80E-04	9.60E-04	2.35E-07	1.00E-06	9.25E-09	1.97E-07	2.1E-07	0.206235427	1.92E-04	748	549989	4162859.51
749	550009	4162859.51	RES	7.40E-04	1.04E-03	2.56E-07	1.09E-06	1.01E-08	2.13E-07	2.2E-07	0.223467044	2.08E-04	749	550009	4162859.51
750	550029	4162859.51	RES	8.00E-04	1.13E-03	2.77E-07	1.18E-06	1.09E-08	2.32E-07	2.4E-07	0.242750617	2.26E-04	750	550029	4162859.51
751	550049	4162859.51	RES	8.80E-04	1.24E-03	3.05E-07	1.30E-06	1.20E-08	2.54E-07	2.7E-07	0.266410092	2.48E-04	751	550049	4162859.51
752	550069	4162859.51	RES	9.60E-04	1.35E-03	3.32E-07	1.41E-06	1.31E-08	2.77E-07	2.9E-07	0.290069567	2.70E-04	752	550069	4162859.51
753	550089	4162859.51	RES	1.06E-03	1.49E-03	3.67E-07	1.56E-06	1.44E-08	3.06E-07	3.2E-07	0.320156899	2.98E-04	753	550089	4162859.51
754	550209	4162859.51	RES	3.10E-03	4.43E-03	1.07E-06	4.63E-06	4.22E-08	9.09E-07	9.5E-07	0.951174923	8.86E-04	754	550209	4162859.51
755	550229	4162859.51	RES	3.64E-03	5.19E-03	1.26E-06	5.42E-06	4.95E-08	1.06E-06	1.1E-06	1.114467302	1.04E-03	755	550229	4162859.51
756	550249	4162859.51	RES	4.36E-03	6.23E-03	1.51E-06	6.51E-06	5.93E-08	1.28E-06	1.3E-06	1.337662359	1.25E-03	756	550249	4162859.51
757	550269	4162859.51	RES	5.27E-03	7.53E-03	1.82E-06	7.87E-06	7.17E-08	1.55E-06	1.6E-06	1.616792173	1.51E-03	757	550269	4162859.51
758	550749	4162859.51	RES	2.70E-03	3.78E-03	9.35E-07	3.95E-06	2.31E-08	4.89E-07	5.1E-07	0.511785526	7.56E-04	758	550749	4162859.51
759	550769	4162859.51	RES	2.47E-03	3.46E-03	8.55E-07	3.62E-06	2.12E-08	4.47E-07	4.7E-07	0.468447528	6.92E-04	759	550769	4162859.51
760	550789	4162859.51	RES	2.28E-03	3.19E-03	7.89E-07	3.33E-06	1.95E-08	4.12E-07	4.3E-07	0.431915898	6.38E-04	760	550789	4162859.51
761	550809	4162859.51	REC	2.13E-03	2.98E-03	7.37E-07	3.11E-06	1.82E-08	3.85E-07	4.0E-07	0.403483368	5.96E-04	761	550809	4162859.51

762	550829	4162859.51	REC	2.01E-03	2.81E-03	6.96E-07	2.94E-06	1.72E-08	3.63E-07	3.8E-07	0.380478798	5.62E-04	762	550829	4162859.51
763	550849	4162859.51	REC	1.91E-03	2.67E-03	6.61E-07	2.79E-06	1.64E-08	3.45E-07	3.6E-07	0.361523779	5.34E-04	763	550849	4162859.51
764	550869	4162859.51	REC	1.83E-03	2.56E-03	6.33E-07	2.68E-06	1.57E-08	3.31E-07	3.5E-07	0.34661831	5.12E-04	764	550869	4162859.51
765	550889	4162859.51	REC	1.75E-03	2.46E-03	6.06E-07	2.57E-06	1.50E-08	3.18E-07	3.3E-07	0.333005574	4.92E-04	765	550889	4162859.51
766	550909	4162859.51	REC	1.70E-03	2.38E-03	5.88E-07	2.49E-06	1.46E-08	3.08E-07	3.2E-07	0.322235331	4.76E-04	766	550909	4162859.51
767	550929	4162859.51	REC	1.66E-03	2.33E-03	5.75E-07	2.44E-06	1.42E-08	3.01E-07	3.2E-07	0.315428963	4.66E-04	767	550929	4162859.51
768	550949	4162859.51	REC	1.60E-03	2.25E-03	5.54E-07	2.35E-06	1.37E-08	2.91E-07	3.0E-07	0.304573045	4.50E-04	768	550949	4162859.51
769	550969	4162859.51	REC	1.54E-03	2.16E-03	5.33E-07	2.26E-06	1.32E-08	2.79E-07	2.9E-07	0.292424393	4.32E-04	769	550969	4162859.51
770	550989	4162859.51	REC	1.47E-03	2.06E-03	5.09E-07	2.15E-06	1.26E-08	2.66E-07	2.8E-07	0.278897333	4.12E-04	770	550989	4162859.51
771	551009	4162859.51	REC	1.39E-03	1.94E-03	4.81E-07	2.03E-06	1.19E-08	2.51E-07	2.6E-07	0.262699131	3.88E-04	771	551009	4162859.51
772	551029	4162859.51	REC	1.30E-03	1.83E-03	4.50E-07	1.91E-06	1.11E-08	2.37E-07	2.5E-07	0.247707986	3.66E-04	772	551029	4162859.51
773	551049	4162859.51	REC	1.22E-03	1.72E-03	4.22E-07	1.80E-06	1.05E-08	2.22E-07	2.3E-07	0.232802517	3.44E-04	773	551049	4162859.51
774	551069	4162859.51	REC	1.15E-03	1.61E-03	3.98E-07	1.68E-06	9.85E-09	2.08E-07	2.2E-07	0.217982724	3.22E-04	774	551069	4162859.51
775	551089	4162859.51	REC	1.07E-03	1.50E-03	3.70E-07	1.57E-06	9.17E-09	1.94E-07	2.0E-07	0.203077255	3.00E-04	775	551089	4162859.51
776	551109	4162859.51	REC	1.01E-03	1.41E-03	3.50E-07	1.47E-06	8.65E-09	1.82E-07	1.9E-07	0.190928604	2.82E-04	776	551109	4162859.51
777	549909	4162879.51	RES	5.20E-04	7.20E-04	1.80E-07	7.53E-07	7.07E-09	1.48E-07	1.5E-07	0.154812563	1.44E-04	777	549909	4162879.51
778	549929	4162879.51	RES	5.50E-04	7.70E-04	1.90E-07	8.05E-07	7.48E-09	1.58E-07	1.7E-07	0.165480329	1.54E-04	778	549929	4162879.51
779	549949	4162879.51	RES	5.90E-04	8.20E-04	2.04E-07	8.57E-07	8.02E-09	1.68E-07	1.8E-07	0.176284088	1.64E-04	779	549949	4162879.51
780	549989	4162879.51	RES	6.80E-04	9.50E-04	2.35E-07	9.93E-07	9.25E-09	1.95E-07	2.0E-07	0.20418347	1.90E-04	780	549989	4162879.51
781	550009	4162879.51	RES	7.30E-04	1.03E-03	2.53E-07	1.08E-06	9.93E-09	2.11E-07	2.2E-07	0.221279093	2.06E-04	781	550009	4162879.51
782	550029	4162879.51	RES	8.00E-04	1.12E-03	2.77E-07	1.17E-06	1.09E-08	2.30E-07	2.4E-07	0.24069866	2.24E-04	782	550029	4162879.51
783	550049	4162879.51	RES	8.70E-04	1.23E-03	3.01E-07	1.29E-06	1.18E-08	2.52E-07	2.6E-07	0.264222142	2.46E-04	783	550049	4162879.51
784	550069	4162879.51	RES	9.50E-04	1.34E-03	3.29E-07	1.40E-06	1.29E-08	2.75E-07	2.9E-07	0.287881616	2.68E-04	784	550069	4162879.51
785	550089	4162879.51	RES	1.07E-03	1.51E-03	3.70E-07	1.58E-06	1.46E-08	3.10E-07	3.2E-07	0.324396807	3.02E-04	785	550089	4162879.51
786	550209	4162879.51	RES	3.04E-03	4.33E-03	1.05E-06	4.53E-06	4.13E-08	8.88E-07	9.3E-07	0.929839392	8.66E-04	786	550209	4162879.51
787	550229	4162879.51	RES	3.54E-03	5.05E-03	1.23E-06	5.28E-06	4.81E-08	1.04E-06	1.1E-06	1.084379969	1.01E-03	787	550229	4162879.51
788	550249	4162879.51	RES	4.21E-03	6.01E-03	1.46E-06	6.28E-06	5.73E-08	1.23E-06	1.3E-06	1.290479403	1.20E-03	788	550249	4162879.51
789	550269	4162879.51	RES	5.04E-03	7.21E-03	1.74E-06	7.54E-06	6.85E-08	1.48E-06	1.5E-06	1.5480017	1.44E-03	789	550269	4162879.51
790	550749	4162879.51	REC	2.86E-03	3.99E-03	9.90E-07	4.17E-06	2.45E-08	5.16E-07	5.4E-07	0.540303731	7.98E-04	790	550749	4162879.51
791	550769	4162879.51	REC	2.61E-03	3.65E-03	9.03E-07	3.82E-06	2.24E-08	4.72E-07	4.9E-07	0.494208915	7.30E-04	791	550769	4162879.51
792	550789	4162879.51	REC	2.40E-03	3.36E-03	8.31E-07	3.51E-06	2.06E-08	4.34E-07	4.5E-07	0.454920468	6.72E-04	792	550789	4162879.51
793	550809	4162879.51	REC	2.24E-03	3.13E-03	7.75E-07	3.27E-06	1.92E-08	4.05E-07	4.2E-07	0.423816797	6.26E-04	793	550809	4162879.51
794	550829	4162879.51	REC	2.10E-03	2.93E-03	7.27E-07	3.06E-06	1.80E-08	3.79E-07	4.0E-07	0.396762676	5.86E-04	794	550829	4162879.51
795	550849	4162879.51	REC	1.98E-03	2.76E-03	6.85E-07	2.88E-06	1.70E-08	3.57E-07	3.7E-07	0.373758106	5.52E-04	795	550849	4162879.51
796	550869	4162879.51	REC	1.88E-03	2.62E-03	6.51E-07	2.74E-06	1.61E-08	3.39E-07	3.5E-07	0.354803087	5.24E-04	796	550869	4162879.51
797	550889	4162879.51	REC	1.81E-03	2.53E-03	6.27E-07	2.64E-06	1.55E-08	3.27E-07	3.4E-07	0.34256876	5.06E-04	797	550889	4162879.51
798	550909	4162879.51	REC	1.72E-03	2.41E-03	5.95E-07	2.52E-06	1.47E-08	3.12E-07	3.3E-07	0.326284882	4.82E-04	798	550909	4162879.51
799	550929	4162879.51	REC	1.67E-03	2.33E-03	5.78E-07	2.44E-06	1.43E-08	3.01E-07	3.2E-07	0.315514639	4.66E-04	799	550929	4162879.51
800	550949	4162879.51	REC	1.59E-03	2.23E-03	5.50E-07	2.33E-06	1.36E-08	2.88E-07	3.0E-07	0.301901903	4.46E-04	800	550949	4162879.51
801	550969	4162879.51	REC	1.55E-03	2.16E-03	5.37E-07	2.26E-06	1.33E-08	2.79E-07	2.9E-07	0.292510069	4.32E-04	801	550969	4162879.51
802	550989	4162879.51	REC	1.47E-03	2.06E-03	5.09E-07	2.15E-06	1.26E-08	2.66E-07	2.8E-07	0.278897333	4.12E-04	802	550989	4162879.51
803	551009	4162879.51	REC	1.39E-03	1.94E-03	4.81E-07	2.03E-06	1.19E-08	2.51E-07	2.6E-07	0.262699131	3.88E-04	803	551009	4162879.51
804	551029	4162879.51	REC	1.31E-03	1.83E-03	4.53E-07	1.91E-06	1.12E-08	2.37E-07	2.5E-07	0.247793662	3.66E-04	804	551029	4162879.51
805	551049	4162879.51	REC	1.23E-03	1.72E-03	4.26E-07	1.80E-06	1.05E-08	2.22E-07	2.3E-07	0.232888193	3.44E-04	805	551049	4162879.51
806	551069	4162879.51	REC	1.14E-03	1.59E-03	3.95E-07	1.66E-06	9.77E-09	2.06E-07	2.2E-07	0.215311582	3.18E-04	806	551069	4162879.51
807	551089	4162879.51	REC	1.07E-03	1.49E-03	3.70E-07	1.56E-06	9.17E-09	1.93E-07	2.0E-07	0.201784522	2.98E-04	807	551089	4162879.51
808	551109	4162879.51	REC	1.00E-03	1.40E-03	3.46E-07	1.46E-06	8.57E-09	1.81E-07	1.9E-07	0.189550195	2.80E-04	808	551109	4162879.51
809	549909	4162899.51	RES	5.10E-04	7.10E-04	1.77E-07	7.42E-07	6.94E-09	1.46E-07	1.5E-07	0.152624613	1.42E-04	809	549909	4162899.51
810	549929	4162899.51	RES	5.40E-04	7.60E-04	1.87E-07	7.94E-07	7.34E-09	1.56E-07	1.6E-07	0.163292378	1.52E-04	810	549929	4162899.51
811	549969	4162899.51	RES	6.30E-04	8.80E-04	2.18E-07	9.20E-07	8.57E-09	1.81E-07	1.9E-07	0.189139803	1.76E-04	811	549969	4162899.51
812	549989	4162899.51	RES	6.70E-04	9.40E-04	2.32E-07	9.82E-07	9.11E-09	1.93E-07	2.0E-07	0.201995519	1.88E-04	812	549989	4162899.51
813	550029	4162899.51	RES	8.00E-04	1.13E-03	2.77E-07	1.18E-06	1.09E-08	2.32E-07	2.4E-07	0.242750617	2.26E-04	813	550029	4162899.51
814	550049	4162899.51	RES	8.70E-04	1.22E-03	3.01E-07	1.28E-06	1.18E-08	2.50E-07	2.6E-07	0.262170184	2.44E-04	814	550049	4162899.51
815	550209	4162899.51	RES	2.96E-03	4.21E-03	1.02E-06	4.40E-06	4.03E-08	8.64E-07	9.0E-07	0.90412796	8.42E-04	815	550209	4162899.51
816	550229	4162899.51	RES	3.43E-03	4.89E-03	1.19E-06	5.11E-06	4.66E-08	1.00E-06	1.1E-06	1.050052729	9.78E-04	816	550229	4162899.51
817	550249	4162899.51	RES	4.05E-03	5.78E-03	1.40E-06	6.04E-06	5.51E-08	1.19E-06	1.2E-06	1.241108496	1.16E-03	817	550249	4162899.51
818	550269	4162899.51	RES	4.87E-03	6.96E-03	1.69E-06	7.27E-06	6.62E-08	1.43E-06	1.5E-06	1.494390886	1.39E-03	818	550269	4162899.51
819	550749	4162899.51	REC	3.02E-03	4.20E-03	1.05E-06	4.39E-06	2.59E-08	5.43E-07	5.7E-07	0.568821936	8.40E-04	819	550749	4162899.51
820	550769	4162899.51	REC	2.75E-03	3.84E-03	9.52E-07	4.01E-06	2.36E-08	4.96E-07	5.2E-07	0.519970303	7.68E-04	820	550769	4162899.51
821	550789	4162899.51	REC	2.53E-03	3.53E-03	8.76E-07	3.69E-06	2.17E-08	4.56E-07	4.8E-07	0.478010713	7.06E-04	821	550789	4162899.51
822	550809	4162899.51	REC	2.34E-03	3.27E-03	8.10E-07	3.42E-06	2.00E-08	4.23E-07	4.4E-07	0.442771816	6.54E-04	822	550809	4162899.51
823	550829	4162899.51	REC	2.18E-03	3.05E-03	7.55E-07	3.19E-06	1.87E-08	3.94E-07	4.1E-07	0.412960878	6.10E-04	823	550829	4162899.51
824	550849	4162899.51	REC	2.05E-03	2.86E-03	7.10E-07	2.99E-06	1.76E-08	3.70E-07	3.9E-07	0.387285166	5.72E-04	824	550849	4162899.51
825	550869	4162899.51	REC	1.94E-03	2.71E-03	6.72E-07	2.83E-06	1.66E-08	3.50E-07	3.7E-07	0.366951738	5.42E-04	825	550869	4162899.51
826	550889	4162899.51	REC	1.84E-03	2.57E-03	6.37E-07	2.69E-06	1.58E-08	3.32E-07	3.5E-07	0.347996719	5.14E-04	826	550889	4162899.51
827	550909	4162899.51	REC	1.75E-03	2.44E-03	6.06E-07	2.55E-06	1.50E-08	3.15E-07	3.3E-07	0.330420108	4.88E-04	827	550909	4162899.51
828	550929	4162899.51	REC	1.68E-03	2.35E-03	5.82E-07	2.46E-06	1.44E-08	3.04E-07	3.2E-07	0.318185781	4.70E-04	828	550929	4162899.51
829	550949	4162899.51	REC	1.62E-03	2.26E-03	5.61E-07	2.36E-06	1.39E-08	2.92E-07	3.1E-07	0.306037129	4.52E-04	829	550949	4162899.51
830	550969	4162899.51	REC	1.54E-03	2.16E-03	5.33E-07	2.26E-06	1.32E-08	2.79E-07	2.9E-07	0.292424393	4.32E-04	830	550969	4162899.51
831	550989	4162899.51	REC	1.46E-03	2.04E-03	5.05E-07	2.13E-06	1.25E-08	2.64E-07	2.8E-07	0.276226191	4.08E-04	831	550989	4162899.51
832	551009	4162899.51	REC	1.38E-03	1.92E-03	4.78E-07	2.01E-06	1.18E-08	2.48E-07	2.6E-07	0.260027989	3.84E-04	832	551009	4162899.51
833	551029	4162899.51	REC	1.30E-03	1.81E-03	4.50E-07	1.89E-06	1.11E-08	2.34E-07	2.5E-07	0.24512252	3.62E-04	833	551029	4162899.51
834	551049	4162899.51	REC	1.21E-03	1.69E-03	4.19E-07	1.77E-06	1.04E-08	2.18E-07	2.3E-07	0.228838643	3.38E-04	834	551049	4162899.51
835	551069	4162899.51	REC	1.13E-03	1.58E-03	3.91E-07	1.65E-06	9.68E-09	2.04E-07	2.1E-07	0.213933174	3.16E-04	835	551069	4162899.51
836	551089	4162899.51	REC	1.06E-03	1.47E-03	3.67E-07	1.54E-06	9.08E-09	1.90E-07	2.0E-07	0.19911338	2.94E-04	836	551089	4162899.51
837	551109	4162899.51	REC	1.00E-03	1.39E-03	3.46E-07	1.45E-06	8.57E-09	1.80E-07	1.9E-07	0.188257462	2.78E-04	837	551109	4162899.51
838	549909	4162919.51	RES	5.00E-04	7.00E-04	1.73E-07	7.32E-07	6.80E-09	1.44E-07	1.5E-07	0.150436663	1.40E-04	838	549909	4162919.51
839	549949	4162919.51	RES	5.80E-04	8.10E-04	2.01E-07	8.47E-07	7.89E-09	1.66E-07	1.7E-07	0.174096137	1.62E-04	839	549949	4162919.51
840	549969	4162919.51	RES	6.20E-04	8.70E-04	2.15E-07	9.09E-07	8.43E-09	1.79E-07	1.9E-07	0.186951853	1.74E-04	840	549969	4162919.51
841	549989	4162919.51	RES	6.80E-04	9.50E-04	2.35E-07	9.93E-07	9.25E-09	1.95E-07	2.0E-07	0.20418347	1.90E-04	841	549989	4162919.51
842	550209	4162919.51	RES	2.86E-03	4.07E-03	9.90E-07	4.25E-06	3.89E-08	8.35E-07	8.7E-07	0.874040628	8.14E-04	842	550209	4162919.51
843	550229	4162919.51	RES	3.32E-03	4.73E-03	1.15E-06	4.94E-06	4.51E-08	9.71E-07	1.0E-06	1.015725489	9.46E-04	843	550229	4162919.51
844	550249	4162919.51	RES	3.88E-03	5.54E-03	1.34E-06	5.79E-06	5.28E-08	1.14E-06	1.2E-06	1.18954964	1.11E-03	844	550249	4162919.51
845	550269	4162919.51	RES	4.67E-03	6.66E-03	1.62E-06	6.96E-06	6.35E-08	1.37E-06	1.4E-06	1.430112307	1.33E-03	845	550269	4162919.51
846	550749	4162919.51	RES	3.18E-03	4.41E-03	1.10E-06	4.61E-06	2.72E-08	5.70E-07	6.0E-07	0.597340141	8.82E-04	846	550749	4162919.51
847	550769	4162919.51	RES	2.90E-03	4.03E-03	1.00E-06	4.21E-06	2.48E-08	5.21E-07	5.5E-07	0.545817366	8.06E-04	847	550769	4162919.51
848	550789	4162919.51	RES	2.66E-03	3.71E-03	9.21E-07	3.88E-06	2.28E-08	4.80E-07	5.0E-07	0.502393692	7.42E-04	848	550789	4162919.51
849	550809	4162919.51	RES	2.46E-03	3.43E-03	8.52E-07	3.59E-06	2.11E-08	4.43E-07	4.6E-07	0.464483653	6.86E-04	849	550809	4162919.51
850	550829	4162919.51	RES	2.28E-03	3.19E-03	7.89E-07	3.33E-06	1.95E-08	4.12E-07	4.3E-07	0.431915898	6.38E-04	850	550829	4162919.51
851	550849	4162919.51	RES	2.13E-03	2.98E-03	7.37E-07	3.11E-06	1.82E-08	3.85E-07	4.0E-07	0.403483368	5.96E-04	851	550849	4162919.51
852	550869	4162919.51	RES	2.01E-03	2.80E-03	6.96E-07	2.93E-06	1.72E-08	3.62E-07	3.8E-07	0.379186065	5.60E-04	852	550869	4162919.51
853	550889	4162919.51	RES	1.89E-03	2.63E-03	6.54E-07	2.75E-06	1.62E-08	3.40E-07	3.6E-07	0.356181495	5.26E-04	853	550889	4162919.51
854	550909	4162919.51	RES	1.79E-03	2.49E-03	6.20E-07	2.60E-06	1.53E-08	3.22E-07	3.4E-07	0.337226476	4.98E-04	854	550909	4162919.51
855	550929	4162919.51	RES	1.70E-03	2.37E-03	5.88E-07	2.48E-06	1.46E-08	3.06E-07	3.2E-07	0.320942598	4.74E-04	855	550929	4162919.51
856	550949	4162919.51	RES	1.61E-03	2.25E-03	5.57E-07	2.35E-06	1.38E-08	2.91E-07	3.0E-07	0.304658721	4.50E-04	856	550949	4162919.51
857	550969	4162919.51	RES	1.54E-03	2.14E-03	5.33E-07	2.24E-06	1.32E-08	2.77E-07	2.9E-07	0.289838927	4.28E-04	857	550969	4162919.51
858	550989	4162919.51	RES	1.44E-03	2.01E-03	4.98E-07	2.10E-06	1.23E-08	2.60E-07	2.7E-07	0.272176641	4.02E-04	858	550989	4162919.51
859	551009	4162919.51	RES	1.36E-03	1.89E-03	4.71E-07	1.98E-06	1.17E-08	2.44E-07	2.6E-07	0.255978439	3.78E-04	859	551009	4162919.51
860	551029	4162919.51	RES	1.28E-03	1.79E-03	4.43E-07	1.87E-06	1.10E-08	2.31E-07	2.4E-07	0.242365703	3.58E-04	860	551029	4162919.51
861	551049	4162919.51	RES	1.20E-03	1.67E-03	4.15E-07	1.75E-06	1.03E-08	2.16E-07	2.3E-07	0.226167501	3.34E-04	861	551049	4162919.51
862	551069	4162919.51	RES	1.11E-03	1.55E-03	3.84E-07	1.62E-06	9.51E-09	2.00E-07	2.1E-07	0.209883623	3.10E-04	862	551069	4162919.51
863	551089	4162919.51	RES	1.04E-03	1.45E-03	3.60E-07	1.52E-06	8.91E-09	1.87E-07	2.0E-07	0.196356563	2.90E-04	863	551089	4162919.51
864	551109	4162919.51	RES	9.80E-04	1.36E-03	3.39E-07	1.42E-06	8.40E-09	1.76E-07	1.8E-07	0.184207911	2.72E-04	864	551109	4162919.51
865	549909	4162939.51	RES	5.00E-04	7.00E-04	1.73E-07	7.32E-07	6.80E-09	1.44E-07	1.5E-07	0.150436663	1.40E-04	865	549909	4162939.51
866	549929	4162939.51	RES	5.30E-04	7.40E-04	1.83E-07	7.73E-07	7.21E-09	1.52E-07	1.6E-07	0.159052471	1.48E-04	866	549929	4162939.51
867	549949	4162939.51	RES	5.70E-04	8.00E-04	1.97E-07	8.36E-07	7.75E-09	1.64E-07	1.7E-07	0.171908187	1.60E-04	867	549949	4162939.51
868	549969	4162939.51	RES	6.20E-04	8.70E-04	2.15E-07	9.09E-07	8.43E-09	1.79E-07	1.9E-07	0.186951853	1.74E-04	868	549969	4162939.51
869	550209	4162939.51	RES	2.79E-03	3.97E-03	9.66E-07	4.15E-06	3.79E-08	8.15E-07	8.5E-07	0.852569103	7.94E-04	869	550209	4162939.51
870	550229	4162939.51	RES	3.19E-03	4.54E-03	1.10E-06	4.75E-06	4.34E-08	9.32E-07	9.7E-07	0.974970391	9.08E-04	870	550229	4162939.51
871	550249	4162939.51	RES	3.71E-03	5.29E-03	1.28E-06	5.53E-06	5.05E-08	1.09E-06	1.1E-06	1.135938826	1.06E-03	871	550249	4162939.51
872	550269	4162939.51	RES	4.43E-03	6.32E-03	1.53E-06	6.61E-06	6.02E-08	1.30E-06	1.4E-06	1.357081926	1.26E-03	872	550269	4162939.51
873	550289	4162939.51	RES	5.41E-03	7.72E-03	1.87E-06	8.07E-06	7.36E-08	1.58E-06	1.7E-06	1.657683265	1.54E-03	873	550289	4162939.51
874	550769	4162939.51	REC	3.05E-03	4.23E-03	1.06E-06	4.42E-06	2.61E-08	5.47E-07	5.7E-07	0.572957162	8.46E-04	874	550769	4162939.51
875	550789	4162939.51	REC	2.80E-03	3.89E-03	9.69E-07	4.07E-06	2.40E-08	5.03E-07	5.3E-07	0.526862347	7.78E-04	875	550789	4162939.51
876	550809	4162939.51	REC	2.58E-03	3.59E-03	8.93E-07	3.75E-06	2.21E-08	4.64E-07	4.9E-07	0.48619549	7.18E-04	876	550809	4162939.51
877	550829	4162939.51	REC	2.39E-03	3.33E-03	8.27E-07	3.48E-06	2.05E-08	4.30E-07	4.5E-07	0.450956593	6.66E-04	877	550829	4162939.51
878	550849	4162939.51	REC	2.22E-03	3.10E-03	7.68E-07	3.24E-06	1.90E-08	4.01E-07	4.2E-07	0.419767246	6.20E-04	878	550849	4162939.51
879	550869	4162939.51	REC	2.07E-03	2.89E-03	7.17E-07	3.02E-06	1.77E-08	3.74E-07	3.9E-07	0.391334717	5.78E-04	879	550869	4162939.51
880	550889	4162939.51	REC	1.94E-03	2.70E-03	6.72E-07	2.82E-06	1.66E-08	3.49E-07	3.7E-07	0.365659005	5.40E-04	880	550889	4162939.51
881	550909	4162939.51	REC	1.82E-03	2.53E-03	6.30E-07	2.64E-06	1.56E-08	3.27E-07	3.4E-07	0.342654435	5.06E-04	881	550909	4162939.51
882	550929	4162939.51	REC	1.71E-03	2.38E-03	5.92E-07	2.49E-06	1.47E-08	3.08E-07	3.2E-07	0.322321007	4.76E-04	882	550929	4162939.51
883	550949	4162939.51	REC	1.61E-03	2.24E-03	5.57E-07	2.34E-06	1.38E-08	2.90E-07	3.0E-07	0.303365987	4.48E-04	883	550949	4162939.51
884	550969	4162939.51	REC	1.52E-03	2.11E-03	5.26E-07	2.21E-06	1.30E-08	2.73E-07	2.9E-07	0.285789377	4.22E-04	884	550969	4162939.51
885	550989	4162939.51	REC	1.42E-03	1.98E-03	4.92E-07	2.07E-06	1.22E-08	2.56E-07	2.7E-07	0.26812709	3.96E-04	885	550989	4162939.51
886	551009	4162939.51	REC	1.34E-03	1.87E-03	4.64E-07	1.95E-06	1.15E-08	2.42E-07	2.5E-07	0.253221621	3.74E-04	886	551009	4162939.51
887	551029	4162939.51	REC	1.27E-03	1.76E-03	4.40E-07	1.84E-06	1.09E-08	2.28E-07	2.4E-07	0.238401828	3.52E-04	887	551029	4162939.51
888	551049	4162939.51	REC	1.18E-03	1.64E-03	4.08E-07	1.71E-06	1.01E-08	2.12E-07	2.2E-07	0.22211795	3.28E-04	888	551049	4162939.51
889	551069	4162939.51	REC	1.10E-03	1.53E-03	3.81E-07	1.60E-06	9.42E-09	1.98E-07	2.1E-07	0.207212481	3.06E-04	889	551069	4162939.51

890	551089	4162939.51	REC	1.03E-03	1.42E-03	3.57E-07	1.48E-06	8.82E-09	1.84E-07	1.9E-07	0.192392688	2.84E-04	890	551089	4162939.51
891	551109	4162939.51	REC	9.60E-04	1.33E-03	3.32E-07	1.39E-06	8.22E-09	1.72E-07	1.8E-07	0.180158361	2.66E-04	891	551109	4162939.51
892	549909	4162959.51	RES	4.90E-04	6.90E-04	1.70E-07	7.21E-07	6.66E-09	1.42E-07	1.5E-07	0.148248712	1.38E-04	892	549909	4162959.51
893	549929	4162959.51	RES	5.30E-04	7.40E-04	1.83E-07	7.73E-07	7.21E-09	1.52E-07	1.6E-07	0.159052471	1.48E-04	893	549929	4162959.51
894	549949	4162959.51	RES	5.70E-04	7.90E-04	1.97E-07	8.26E-07	7.75E-09	1.62E-07	1.7E-07	0.16985623	1.58E-04	894	549949	4162959.51
895	550189	4162959.51	RES	2.42E-03	3.44E-03	8.38E-07	3.60E-06	3.29E-08	7.06E-07	7.4E-07	0.738783625	6.88E-04	895	550189	4162959.51
896	550209	4162959.51	RES	2.72E-03	3.86E-03	9.42E-07	4.03E-06	3.70E-08	7.92E-07	8.3E-07	0.829045622	7.72E-04	896	550209	4162959.51
897	550229	4162959.51	RES	3.08E-03	4.38E-03	1.07E-06	4.58E-06	4.19E-08	8.99E-07	9.4E-07	0.940643151	8.76E-04	897	550229	4162959.51
898	550249	4162959.51	RES	3.55E-03	5.06E-03	1.23E-06	5.29E-06	4.83E-08	1.04E-06	1.1E-06	1.086567919	1.01E-03	898	550249	4162959.51
899	550269	4162959.51	RES	4.18E-03	5.96E-03	1.45E-06	6.23E-06	5.68E-08	1.22E-06	1.3E-06	1.279811637	1.19E-03	899	550269	4162959.51
900	550289	4162959.51	RES	5.04E-03	7.19E-03	1.74E-06	7.52E-06	6.85E-08	1.48E-06	1.5E-06	1.543897786	1.44E-03	900	550289	4162959.51
901	550789	4162959.51	RES	2.94E-03	4.07E-03	1.02E-06	4.25E-06	2.52E-08	5.26E-07	5.5E-07	0.551331001	8.14E-04	901	550789	4162959.51
902	550809	4162959.51	RES	2.70E-03	3.75E-03	9.35E-07	3.92E-06	2.31E-08	4.85E-07	5.1E-07	0.507907327	7.50E-04	902	550809	4162959.51
903	550829	4162959.51	RES	2.49E-03	3.46E-03	8.62E-07	3.62E-06	2.13E-08	4.47E-07	4.7E-07	0.468618879	6.92E-04	903	550829	4162959.51
904	550849	4162959.51	RES	2.31E-03	3.21E-03	8.00E-07	3.36E-06	1.98E-08	4.15E-07	4.3E-07	0.434758391	6.42E-04	904	550849	4162959.51
905	550869	4162959.51	RES	2.14E-03	2.98E-03	7.41E-07	3.11E-06	1.83E-08	3.85E-07	4.0E-07	0.403569044	5.96E-04	905	550869	4162959.51
906	550889	4162959.51	RES	1.99E-03	2.77E-03	6.89E-07	2.90E-06	1.70E-08	3.58E-07	3.8E-07	0.375136515	5.54E-04	906	550889	4162959.51
907	550909	4162959.51	RES	1.85E-03	2.58E-03	6.40E-07	2.70E-06	1.59E-08	3.34E-07	3.5E-07	0.349375127	5.16E-04	907	550909	4162959.51
908	550929	4162959.51	RES	1.73E-03	2.40E-03	5.99E-07	2.51E-06	1.48E-08	3.10E-07	3.3E-07	0.325077824	4.80E-04	908	550929	4162959.51
909	550949	4162959.51	RES	1.61E-03	2.24E-03	5.57E-07	2.34E-06	1.38E-08	2.90E-07	3.0E-07	0.303365987	4.48E-04	909	550949	4162959.51
910	550969	4162959.51	RES	1.50E-03	2.09E-03	5.19E-07	2.18E-06	1.29E-08	2.70E-07	2.8E-07	0.283032559	4.18E-04	910	550969	4162959.51
911	550989	4162959.51	RES	1.41E-03	1.96E-03	4.88E-07	2.05E-06	1.21E-08	2.53E-07	2.7E-07	0.265455949	3.92E-04	911	550989	4162959.51
912	551009	4162959.51	RES	1.33E-03	1.84E-03	4.60E-07	1.92E-06	1.14E-08	2.38E-07	2.5E-07	0.249257746	3.68E-04	912	551009	4162959.51
913	551029	4162959.51	RES	1.25E-03	1.74E-03	4.33E-07	1.82E-06	1.07E-08	2.25E-07	2.4E-07	0.235645011	3.48E-04	913	551029	4162959.51
914	551049	4162959.51	REC	1.17E-03	1.62E-03	4.05E-07	1.69E-06	1.00E-08	2.09E-07	2.2E-07	0.219446809	3.24E-04	914	551049	4162959.51
915	551069	4162959.51	REC	1.09E-03	1.51E-03	3.77E-07	1.58E-06	9.34E-09	1.95E-07	2.0E-07	0.20454134	3.02E-04	915	551069	4162959.51
916	551089	4162959.51	REC	1.01E-03	1.40E-03	3.50E-07	1.46E-06	8.65E-09	1.81E-07	1.9E-07	0.189635871	2.80E-04	916	551089	4162959.51
917	551109	4162959.51	REC	9.40E-04	1.30E-03	3.25E-07	1.36E-06	8.05E-09	1.68E-07	1.8E-07	0.17610881	2.60E-04	917	551109	4162959.51
918	549909	4162979.51	RES	4.90E-04	6.90E-04	1.70E-07	7.21E-07	6.66E-09	1.42E-07	1.5E-07	0.148248712	1.38E-04	918	549909	4162979.51
919	549929	4162979.51	RES	5.20E-04	7.30E-04	1.80E-07	7.63E-07	7.07E-09	1.50E-07	1.6E-07	0.156864521	1.46E-04	919	549929	4162979.51
920	550149	4162979.51	RES	1.92E-03	2.72E-03	6.65E-07	2.84E-06	2.61E-08	5.58E-07	5.8E-07	0.584243047	5.44E-04	920	550149	4162979.51
921	550169	4162979.51	RES	2.13E-03	3.02E-03	7.37E-07	3.16E-06	2.90E-08	6.20E-07	6.5E-07	0.64865762	6.04E-04	921	550169	4162979.51
922	550189	4162979.51	RES	2.36E-03	3.35E-03	8.17E-07	3.50E-06	3.21E-08	6.87E-07	7.2E-07	0.719500051	6.70E-04	922	550189	4162979.51
923	550209	4162979.51	RES	2.64E-03	3.75E-03	9.14E-07	3.92E-06	3.59E-08	7.69E-07	8.1E-07	0.805386147	7.50E-04	923	550209	4162979.51
924	550229	4162979.51	RES	2.99E-03	4.25E-03	1.04E-06	4.44E-06	4.07E-08	8.72E-07	9.1E-07	0.912743769	8.50E-04	924	550229	4162979.51
925	550249	4162979.51	RES	3.40E-03	4.84E-03	1.18E-06	5.06E-06	4.62E-08	9.93E-07	1.0E-06	1.039384963	9.68E-04	925	550249	4162979.51
926	550269	4162979.51	RES	3.93E-03	5.59E-03	1.36E-06	5.84E-06	5.34E-08	1.15E-06	1.2E-06	1.200489392	1.12E-03	926	550269	4162979.51
927	550289	4162979.51	RES	4.68E-03	6.67E-03	1.62E-06	6.97E-06	6.36E-08	1.37E-06	1.4E-06	1.432300257	1.33E-03	927	550289	4162979.51
928	550309	4162979.51	RES	5.68E-03	8.10E-03	1.97E-06	8.47E-06	7.72E-08	1.66E-06	1.7E-06	1.739329454	1.62E-03	928	550309	4162979.51
929	550809	4162979.51	RES	2.82E-03	3.91E-03	9.76E-07	4.09E-06	2.42E-08	5.05E-07	5.3E-07	0.529619164	7.82E-04	929	550809	4162979.51
930	550829	4162979.51	RES	2.59E-03	3.59E-03	8.97E-07	3.75E-06	2.22E-08	4.64E-07	4.9E-07	0.486281166	7.18E-04	930	550829	4162979.51
931	550849	4162979.51	RES	2.38E-03	3.31E-03	8.24E-07	3.46E-06	2.04E-08	4.28E-07	4.5E-07	0.448285451	6.62E-04	931	550849	4162979.51
932	550869	4162979.51	RES	2.20E-03	3.05E-03	7.62E-07	3.19E-06	1.88E-08	3.94E-07	4.1E-07	0.41313223	6.10E-04	932	550869	4162979.51
933	550889	4162979.51	RES	2.03E-03	2.82E-03	7.03E-07	2.95E-06	1.74E-08	3.65E-07	3.8E-07	0.381942883	5.64E-04	933	550889	4162979.51
934	550909	4162979.51	RES	1.88E-03	2.61E-03	6.51E-07	2.73E-06	1.61E-08	3.37E-07	3.5E-07	0.353510354	5.22E-04	934	550909	4162979.51
935	550929	4162979.51	RES	1.74E-03	2.42E-03	6.02E-07	2.53E-06	1.49E-08	3.13E-07	3.3E-07	0.327748966	4.84E-04	935	550929	4162979.51
936	550949	4162979.51	RES	1.61E-03	2.24E-03	5.57E-07	2.34E-06	1.38E-08	2.90E-07	3.0E-07	0.303365987	4.48E-04	936	550949	4162979.51
937	550969	4162979.51	RES	1.50E-03	2.08E-03	5.19E-07	2.17E-06	1.29E-08	2.69E-07	2.8E-07	0.281739826	4.16E-04	937	550969	4162979.51
938	550989	4162979.51	RES	1.39E-03	1.93E-03	4.81E-07	2.02E-06	1.19E-08	2.49E-07	2.6E-07	0.261406398	3.86E-04	938	550989	4162979.51
939	551009	4162979.51	RES	1.31E-03	1.82E-03	4.53E-07	1.90E-06	1.12E-08	2.35E-07	2.5E-07	0.246500929	3.64E-04	939	551009	4162979.51
940	551029	4162979.51	RES	1.24E-03	1.71E-03	4.29E-07	1.79E-06	1.06E-08	2.21E-07	2.3E-07	0.231681136	3.42E-04	940	551029	4162979.51
941	551049	4162979.51	RES	1.15E-03	1.59E-03	3.98E-07	1.66E-06	9.85E-09	2.06E-07	2.2E-07	0.215397258	3.18E-04	941	551049	4162979.51
942	551069	4162979.51	RES	1.07E-03	1.48E-03	3.70E-07	1.55E-06	9.17E-09	1.91E-07	2.0E-07	0.200491789	2.96E-04	942	551069	4162979.51
943	551089	4162979.51	RES	9.90E-04	1.37E-03	3.43E-07	1.43E-06	8.48E-09	1.77E-07	1.9E-07	0.18558632	2.74E-04	943	551089	4162979.51
944	551109	4162979.51	RES	9.10E-04	1.26E-03	3.15E-07	1.32E-06	7.80E-09	1.63E-07	1.7E-07	0.170680851	2.52E-04	944	551109	4162979.51
945	549909	4162999.51	RES	4.90E-04	6.90E-04	1.70E-07	7.21E-07	6.66E-09	1.42E-07	1.5E-07	0.148248712	1.38E-04	945	549909	4162999.51
946	550129	4162999.51	RES	1.67E-03	2.37E-03	5.78E-07	2.48E-06	2.27E-08	4.86E-07	5.1E-07	0.509024716	4.74E-04	946	550129	4162999.51
947	550149	4162999.51	RES	1.87E-03	2.65E-03	6.47E-07	2.77E-06	2.54E-08	5.44E-07	5.7E-07	0.569199381	5.30E-04	947	550149	4162999.51
948	550169	4162999.51	RES	2.08E-03	2.94E-03	7.20E-07	3.07E-06	2.83E-08	6.03E-07	6.3E-07	0.631561997	5.88E-04	948	550169	4162999.51
949	550189	4162999.51	RES	2.32E-03	3.29E-03	8.03E-07	3.44E-06	3.16E-08	6.75E-07	7.1E-07	0.706644335	6.58E-04	949	550189	4162999.51
950	550209	4162999.51	RES	2.60E-03	3.68E-03	9.00E-07	3.85E-06	3.54E-08	7.55E-07	7.9E-07	0.790478474	7.36E-04	950	550209	4162999.51
951	550229	4162999.51	RES	2.90E-03	4.12E-03	1.00E-06	4.31E-06	3.94E-08	8.45E-07	8.8E-07	0.884844386	8.24E-04	951	550229	4162999.51
952	550249	4162999.51	RES	3.19E-03	4.52E-03	1.10E-06	4.72E-06	4.34E-08	9.27E-07	9.7E-07	0.970866476	9.04E-04	952	550249	4162999.51
953	550269	4162999.51	RES	3.68E-03	5.24E-03	1.27E-06	5.48E-06	5.00E-08	1.08E-06	1.1E-06	1.12527106	1.05E-03	953	550269	4162999.51
954	550289	4162999.51	RES	4.35E-03	6.19E-03	1.51E-06	6.47E-06	5.92E-08	1.27E-06	1.3E-06	1.329318537	1.24E-03	954	550289	4162999.51
955	550309	4162999.51	RES	5.23E-03	7.45E-03	1.81E-06	7.79E-06	7.11E-08	1.53E-06	1.6E-06	1.599832543	1.49E-03	955	550309	4162999.51
956	550329	4162999.51	RES	6.39E-03	9.12E-03	2.21E-06	9.53E-06	8.69E-08	1.87E-06	2.0E-06	1.958284604	1.82E-03	956	550329	4162999.51
957	550829	4162999.51	REC	2.68E-03	3.70E-03	9.28E-07	3.87E-06	2.30E-08	4.78E-07	5.0E-07	0.50127231	7.40E-04	957	550829	4162999.51
958	550849	4162999.51	REC	2.45E-03	3.39E-03	8.48E-07	3.54E-06	2.10E-08	4.38E-07	4.6E-07	0.459227045	6.78E-04	958	550849	4162999.51
959	550869	4162999.51	REC	2.24E-03	3.11E-03	7.75E-07	3.25E-06	1.92E-08	4.02E-07	4.2E-07	0.421231331	6.22E-04	959	550869	4162999.51
960	550889	4162999.51	REC	2.06E-03	2.86E-03	7.13E-07	2.99E-06	1.76E-08	3.70E-07	3.9E-07	0.387370842	5.72E-04	960	550889	4162999.51
961	550909	4162999.51	REC	1.89E-03	2.63E-03	6.54E-07	2.75E-06	1.62E-08	3.40E-07	3.6E-07	0.356181495	5.26E-04	961	550909	4162999.51
962	550929	4162999.51	REC	1.74E-03	2.42E-03	6.02E-07	2.53E-06	1.49E-08	3.13E-07	3.3E-07	0.327748966	4.84E-04	962	550929	4162999.51
963	550949	4162999.51	REC	1.61E-03	2.23E-03	5.57E-07	2.33E-06	1.38E-08	2.88E-07	3.0E-07	0.302073254	4.46E-04	963	550949	4162999.51
964	550969	4162999.51	REC	1.48E-03	2.06E-03	5.12E-07	2.15E-06	1.27E-08	2.66E-07	2.8E-07	0.278983009	4.12E-04	964	550969	4162999.51
965	550989	4162999.51	REC	1.37E-03	1.90E-03	4.74E-07	1.99E-06	1.17E-08	2.46E-07	2.6E-07	0.257356847	3.80E-04	965	550989	4162999.51
966	551009	4162999.51	REC	1.28E-03	1.78E-03	4.43E-07	1.86E-06	1.10E-08	2.30E-07	2.4E-07	0.24107297	3.56E-04	966	551009	4162999.51
967	551029	4162999.51	REC	1.20E-03	1.66E-03	4.15E-07	1.74E-06	1.03E-08	2.15E-07	2.2E-07	0.224874768	3.32E-04	967	551029	4162999.51
968	551049	4162999.51	REC	1.12E-03	1.55E-03	3.88E-07	1.62E-06	9.60E-09	2.00E-07	2.1E-07	0.209969299	3.10E-04	968	551049	4162999.51
969	551069	4162999.51	REC	1.04E-03	1.43E-03	3.60E-07	1.49E-06	8.91E-09	1.85E-07	1.9E-07	0.193771097	2.86E-04	969	551069	4162999.51
970	551089	4162999.51	REC	9.60E-04	1.33E-03	3.32E-07	1.39E-06	8.22E-09	1.72E-07	1.8E-07	0.180158361	2.66E-04	970	551089	4162999.51
971	551109	4162999.51	REC	8.90E-04	1.23E-03	3.08E-07	1.29E-06	7.63E-09	1.59E-07	1.7E-07	0.166631301	2.46E-04	971	551109	4162999.51
972	550089	4163019.51	RES	1.30E-03	1.83E-03	4.50E-07	1.91E-06	1.77E-08	3.76E-07	3.9E-07	0.39318728	3.66E-04	972	550089	4163019.51
973	550109	4163019.51	RES	1.44E-03	2.03E-03	4.98E-07	2.12E-06	1.96E-08	4.17E-07	4.4E-07	0.436130328	4.06E-04	973	550109	4163019.51
974	550129	4163019.51	RES	1.61E-03	2.28E-03	5.57E-07	2.38E-06	2.19E-08	4.68E-07	4.9E-07	0.489741142	4.56E-04	974	550129	4163019.51
975	550149	4163019.51	RES	1.81E-03	2.56E-03	6.27E-07	2.68E-06	2.46E-08	5.25E-07	5.5E-07	0.549915807	5.12E-04	975	550149	4163019.51
976	550169	4163019.51	RES	2.03E-03	2.87E-03	7.03E-07	3.00E-06	2.76E-08	5.89E-07	6.2E-07	0.61651833	5.74E-04	976	550169	4163019.51
977	550189	4163019.51	RES	2.26E-03	3.21E-03	7.82E-07	3.36E-06	3.07E-08	6.59E-07	6.9E-07	0.689412718	6.42E-04	977	550189	4163019.51
978	550209	4163019.51	RES	2.51E-03	3.56E-03	8.69E-07	3.72E-06	3.41E-08	7.30E-07	7.6E-07	0.764631049	7.12E-04	978	550209	4163019.51
979	550269	4163019.51	RES	3.45E-03	4.89E-03	1.19E-06	5.11E-06	4.69E-08	1.00E-06	1.1E-06	1.050324715	9.78E-04	979	550269	4163019.51
980	550289	4163019.51	RES	4.05E-03	5.76E-03	1.40E-06	6.02E-06	5.51E-08	1.18E-06	1.2E-06	1.237004582	1.15E-03	980	550289	4163019.51
981	550309	4163019.51	RES	4.84E-03	6.89E-03	1.68E-06	7.20E-06	6.58E-08	1.41E-06	1.5E-06	1.479619206	1.38E-03	981	550309	4163019.51
982	550329	4163019.51	RES	5.89E-03	8.40E-03	2.04E-06	8.78E-06	8.01E-08	1.72E-06	1.8E-06	1.803744027	1.68E-03	982	550329	4163019.51
983	550849	4163019.51	RES	2.49E-03	3.44E-03	8.62E-07	3.60E-06	2.13E-08	4.45E-07	4.7E-07	0.466033413	6.88E-04	983	550849	4163019.51
984	550869	4163019.51	RES	2.27E-03	3.13E-03	7.86E-07	3.27E-06	1.94E-08	4.05E-07	4.2E-07	0.424073824	6.26E-04	984	550869	4163019.51
985	550889	4163019.51	RES	2.07E-03	2.86E-03	7.17E-07	2.99E-06	1.77E-08	3.70E-07	3.9E-07	0.387456518	5.72E-04	985	550889	4163019.51
986	550909	4163019.51	RES	1.89E-03	2.61E-03	6.54E-07	2.73E-06	1.62E-08	3.37E-07	3.5E-07	0.353596029	5.22E-04	986	550909	4163019.51
987	550929	4163019.51	RES	1.73E-03	2.39E-03	5.99E-07	2.50E-06	1.48E-08	3.09E-07	3.2E-07	0.323785091	4.78E-04	987	550929	4163019.51
988	550949	4163019.51	RES	1.59E-03	2.20E-03	5.50E-07	2.30E-06	1.36E-08	2.84E-07	3.0E-07	0.298023704	4.40E-04	988	550949	4163019.51
989	550969	4163019.51	RES	1.46E-03	2.02E-03	5.05E-07	2.11E-06	1.25E-08	2.61E-07	2.7E-07	0.273640725	4.04E-04	989	550969	4163019.51
990	550989	4163019.51	RES	1.35E-03	1.86E-03	4.67E-07	1.94E-06	1.16E-08	2.40E-07	2.5E-07	0.252014564	3.72E-04	990	550989	4163019.51
991	551009	4163019.51	RES	1.25E-03	1.72E-03	4.33E-07	1.80E-06	1.07E-08	2.22E-07	2.3E-07	0.233059544	3.44E-04	991	551009	4163019.51
992	551029	4163019.51	RES	1.16E-03	1.60E-03	4.02E-07	1.67E-06	9.94E-09	2.07E-07	2.2E-07	0.216775667	3.20E-04	992	551029	4163019.51
993	551049	4163019.51	RES	1.08E-03	1.49E-03	3.74E-07	1.56E-06	9.25E-09	1.93E-07	2.0E-07	0.201870198	2.98E-04	993	551049	4163019.51
994	551069	4163019.51	RES	1.00E-03	1.38E-03	3.46E-07	1.44E-06	8.57E-09	1.78E-07	1.9E-07	0.186964729	2.76E-04	994	551069	4163019.51
995	551089	4163019.51	RES	9.30E-04	1.28E-03	3.22E-07	1.34E-06	7.97E-09	1.65E-07	1.7E-07	0.173437669	2.56E-04	995	551089	4163019.51
996	551109	4163019.51	RES	8.70E-04	1.20E-03	3.01E-07	1.25E-06	7.45E-09	1.55E-07	1.6E-07	0.16258175	2.40E-04	996	551109	4163019.51
997	549929	4163039.51	RES	6.00E-04	8.40E-04	2.08E-07	8.78E-07	8.16E-09	1.72E-07	1.8E-07	0.180523995	1.68E-04	997	549929	4163039.51
998	549949	4163039.51	RES	6.80E-04	9.50E-04	2.35E-07	9.93E-07	9.25E-09	1.95E-07	2.0E-07	0.20418347	1.90E-04	998	549949	4163039.51
999	549969	4163039.51	RES	7.40E-04	1.04E-03	2.56E-07	1.09E-06	1.01E-08	2.13E-07	2.2E-07	0.223467044	2.08E-04	999	549969	4163039.51
1000	549989	4163039.51	RES	8.10E-04	1.13E-03	2.80E-07	1.18E-06	1.10E-08	2.32E-07	2.4E-07	0.242886611	2.26E-04	1000	549989	4163039.51
1001	550009	4163039.51	RES	8.80E-04	1.23E-03	3.05E-07	1.29E-06	1.20E-08	2.52E-07	2.6E-07	0.264358135	2.46E-04	1001	550009	4163039.51
1002	550029	4163039.51	RES	9.50E-04	1.34E-03	3.29E-07	1.40E-06	1.29E-08	2.75E-07	2.9E-07	0.287881616	2.68E-04	1002	550029	4163039.51
1003	550049	4163039.51	RES	1.04E-03	1.46E-03	3.60E-07	1.53E-06	1.41E-08	3.00E-07	3.1E-07	0.313729041	2.92E-04	1003	550049	4163039.51
1004	550069	4163039.51	RES	1.13E-03	1.59E-03	3.91E-07	1.66E-06	1.54E-08	3.26E-07	3.4E-07	0.341628423	3.18E-04	1004	550069	4163039.51
1005	550089	4163039.51	RES	1.24E-03	1.75E-03	4.29E-07	1.83E-06	1.69E-08	3.59E-07	3.8E-07	0.375955663	3.50E-04	1005	550089	4163039.51
1006	550109	4163039.51	RES	1.38E-03	1.95E-03	4.78E-07	2.04E-06	1.88E-08	4.00E-07	4.2E-07	0.418898712	3.90E-04	1006	550109	4163039.51
1007	550129	4163039.51	RES	1.55E-03	2.19E-03	5.37E-07	2.29E-06	2.11E-08	4.49E-07	4.7E-07	0.470457568	4.38E-04	1007	550129	4163039.51
1008	550149	4163039.51	RES	1.74E-03	2.46E-03	6.02E-07	2.57E-06	2.37E-08	5.05E-07	5.3E-07	0.528444283	4.92E-04	1008	550149	4163039.51
1009	550169	4163039.51	RES	1.93E-03	2.73E-03	6.68E-07	2.85E-06	2.62E-08	5.60E-07	5.9E-07	0.586430998	5.46E-04	1009	550169	4163039.51
1010	550189	4163039.51	RES	2.15E-03	3.04E-03	7.44E-07	3.18E-06	2.92E-08	6.24E-07	6.5E-07	0.653033521	6.08E-04	1010	550189	4163039.51
1011	550269	4163039.51	RES	3.22E-03	4.57E-03	1.11E-06	4.78E-06	4.38E-08	9.38E-07	9.8E-07	0.981534242	9.14E-04	1011	550269	4163039.51
1012	550289	4163039.51	RES	3.78E-03	5.37E-03	1.31E-06	5.61E-06	5.14E-08	1.10E-06	1.2E-06	1.153306436	1.07E-03	1012	550289	4163039.51
1013	550309	4163039.51	RES	4.51E-03	6.42E-03	1.56E-06	6.71E-06	6.13E-08	1.32E-06	1.4E-06	1.378689443	1.28E-03	1013	550309	4163039.51
1014	550329	4163039.51	RES	5.49E-03	7.82E-03	1.90E-06	8.17E-06	7.47E-08	1.60E-06	1.7E-06	1.679290782	1.56E-03	1014	550329	4163039.51
1015	550849	4163039.51	REC	2.51E-03	3.46E-03	8.69E-07	3.62E-06	2.15E-08	4.47E-07	4.7E-07	0.468790231	6.92E-04	1015	550849	4163039.51
1016	550869	4163039.51	REC	2.27E-03	3.13E-03	7.86E-07	3.27E-06	1.94E-08	4.05E-07	4.2E-07	0.424073824	6.26E-04	1016	550869	4163039.51
1017	550889	4163039.51	REC	2.05E-03	2.83E-03	7.10E-07	2.96E-06	1.76E-08	3.66E-07	3.8E-07	0.383406967	5.66E-04	1017	550889	4163039.51

1018	550909	4163039.51	REC	1.87E-03	2.58E-03	6.47E-07	2.70E-06	1.60E-08	3.34E-07	3.5E-07	0.349546479	5.16E-04	1018	550909	4163039.51
1019	550929	4163039.51	REC	1.70E-03	2.35E-03	5.88E-07	2.46E-06	1.46E-08	3.04E-07	3.2E-07	0.318357132	4.70E-04	1019	550929	4163039.51
1020	550949	4163039.51	REC	1.56E-03	2.15E-03	5.40E-07	2.25E-06	1.34E-08	2.78E-07	2.9E-07	0.291303012	4.30E-04	1020	550949	4163039.51
1021	550969	4163039.51	REC	1.43E-03	1.97E-03	4.95E-07	2.06E-06	1.23E-08	2.55E-07	2.7E-07	0.266920033	3.94E-04	1021	550969	4163039.51
1022	550989	4163039.51	REC	1.31E-03	1.81E-03	4.53E-07	1.89E-06	1.12E-08	2.34E-07	2.5E-07	0.245208196	3.62E-04	1022	550989	4163039.51
1023	551009	4163039.51	REC	1.21E-03	1.67E-03	4.19E-07	1.75E-06	1.04E-08	2.16E-07	2.3E-07	0.226253176	3.34E-04	1023	551009	4163039.51
1024	551029	4163039.51	REC	1.12E-03	1.54E-03	3.88E-07	1.61E-06	9.60E-09	1.99E-07	2.1E-07	0.208676566	3.08E-04	1024	551029	4163039.51
1025	551049	4163039.51	REC	1.04E-03	1.43E-03	3.60E-07	1.49E-06	8.91E-09	1.85E-07	1.9E-07	0.193771097	2.86E-04	1025	551049	4163039.51
1026	551069	4163039.51	REC	9.70E-04	1.33E-03	3.36E-07	1.39E-06	8.31E-09	1.72E-07	1.8E-07	0.180244037	2.66E-04	1026	551069	4163039.51
1027	551089	4163039.51	REC	9.00E-04	1.24E-03	3.12E-07	1.30E-06	7.71E-09	1.60E-07	1.7E-07	0.168009709	2.48E-04	1027	551089	4163039.51
1028	551109	4163039.51	REC	8.40E-04	1.15E-03	2.91E-07	1.20E-06	7.20E-09	1.49E-07	1.6E-07	0.155861058	2.30E-04	1028	551109	4163039.51
1029	549909	4163059.51	RES	5.30E-04	7.50E-04	1.83E-07	7.84E-07	7.21E-09	1.54E-07	1.6E-07	0.161104428	1.50E-04	1029	549909	4163059.51
1030	549929	4163059.51	RES	5.90E-04	8.20E-04	2.04E-07	8.57E-07	8.02E-09	1.68E-07	1.8E-07	0.176284088	1.64E-04	1030	549929	4163059.51
1031	549949	4163059.51	RES	6.60E-04	9.20E-04	2.28E-07	9.62E-07	8.98E-09	1.89E-07	2.0E-07	0.197755612	1.84E-04	1031	549949	4163059.51
1032	549969	4163059.51	RES	7.30E-04	1.02E-03	2.53E-07	1.07E-06	9.93E-09	2.09E-07	2.2E-07	0.219227136	2.04E-04	1032	549969	4163059.51
1033	549989	4163059.51	RES	7.90E-04	1.11E-03	2.73E-07	1.16E-06	1.07E-08	2.28E-07	2.4E-07	0.23851071	2.22E-04	1033	549989	4163059.51
1034	550009	4163059.51	RES	8.60E-04	1.20E-03	2.98E-07	1.25E-06	1.17E-08	2.46E-07	2.6E-07	0.257930277	2.40E-04	1034	550009	4163059.51
1035	550029	4163059.51	RES	9.30E-04	1.30E-03	3.22E-07	1.36E-06	1.26E-08	2.67E-07	2.8E-07	0.279401801	2.60E-04	1035	550029	4163059.51
1036	550049	4163059.51	RES	1.00E-03	1.40E-03	3.46E-07	1.46E-06	1.36E-08	2.87E-07	3.0E-07	0.300873325	2.80E-04	1036	550049	4163059.51
1037	550089	4163059.51	RES	1.19E-03	1.67E-03	4.12E-07	1.75E-06	1.62E-08	3.43E-07	3.6E-07	0.35886004	3.34E-04	1037	550089	4163059.51
1038	550109	4163059.51	RES	1.32E-03	1.86E-03	4.57E-07	1.94E-06	1.80E-08	3.82E-07	4.0E-07	0.399615138	3.72E-04	1038	550109	4163059.51
1039	550129	4163059.51	RES	1.48E-03	2.09E-03	5.12E-07	2.18E-06	1.27E-08	2.70E-07	2.8E-07	0.282861208	4.18E-04	1039	550129	4163059.51
1040	550149	4163059.51	RES	1.65E-03	2.33E-03	5.71E-07	2.44E-06	2.24E-08	4.78E-07	5.0E-07	0.500544901	4.66E-04	1040	550149	4163059.51
1041	550169	4163059.51	RES	1.82E-03	2.57E-03	6.30E-07	2.69E-06	2.48E-08	5.27E-07	5.5E-07	0.552103758	5.14E-04	1041	550169	4163059.51
1042	550189	4163059.51	RES	2.00E-03	2.83E-03	6.92E-07	2.96E-06	2.72E-08	5.81E-07	6.1E-07	0.607902522	5.66E-04	1042	550189	4163059.51
1043	550209	4163059.51	RES	2.25E-03	3.18E-03	7.79E-07	3.32E-06	3.06E-08	6.53E-07	6.8E-07	0.683120853	6.36E-04	1043	550209	4163059.51
1044	550229	4163059.51	RES	2.48E-03	3.51E-03	8.58E-07	3.67E-06	3.37E-08	7.20E-07	7.5E-07	0.753963284	7.02E-04	1044	550229	4163059.51
1045	550269	4163059.51	RES	3.02E-03	4.28E-03	1.05E-06	4.47E-06	4.11E-08	8.78E-07	9.2E-07	0.91930762	8.56E-04	1045	550269	4163059.51
1046	550289	4163059.51	RES	3.55E-03	5.03E-03	1.23E-06	5.26E-06	4.83E-08	1.03E-06	1.1E-06	1.080412048	1.01E-03	1046	550289	4163059.51
1047	550309	4163059.51	RES	4.23E-03	6.01E-03	1.46E-06	6.28E-06	5.75E-08	1.23E-06	1.3E-06	1.290751389	1.20E-03	1047	550309	4163059.51
1048	550329	4163059.51	RES	5.14E-03	7.32E-03	1.78E-06	7.65E-06	6.99E-08	1.50E-06	1.6E-06	1.571933161	1.46E-03	1048	550329	4163059.51
1049	550869	4163059.51	RES	2.24E-03	3.08E-03	7.75E-07	3.22E-06	1.92E-08	3.98E-07	4.2E-07	0.417353131	6.16E-04	1049	550869	4163059.51
1050	550889	4163059.51	RES	2.02E-03	2.78E-03	6.99E-07	2.91E-06	1.73E-08	3.59E-07	3.8E-07	0.376686275	5.56E-04	1050	550889	4163059.51
1051	550909	4163059.51	RES	1.83E-03	2.51E-03	6.33E-07	2.62E-06	1.57E-08	3.24E-07	3.4E-07	0.340154645	5.02E-04	1051	550909	4163059.51
1052	550929	4163059.51	RES	1.66E-03	2.28E-03	5.75E-07	2.38E-06	1.42E-08	2.95E-07	3.1E-07	0.308965298	4.56E-04	1052	550929	4163059.51
1053	550949	4163059.51	RES	1.51E-03	2.08E-03	5.23E-07	2.17E-06	1.29E-08	2.69E-07	2.8E-07	0.281825502	4.16E-04	1053	550949	4163059.51
1054	550969	4163059.51	RES	1.38E-03	1.90E-03	4.78E-07	1.99E-06	1.18E-08	2.46E-07	2.6E-07	0.257442523	3.80E-04	1054	550969	4163059.51
1055	550989	4163059.51	RES	1.27E-03	1.74E-03	4.40E-07	1.82E-06	1.09E-08	2.25E-07	2.4E-07	0.235816362	3.48E-04	1055	550989	4163059.51
1056	551009	4163059.51	RES	1.17E-03	1.61E-03	4.05E-07	1.68E-06	1.00E-08	2.08E-07	2.2E-07	0.218154075	3.22E-04	1056	551009	4163059.51
1057	551029	4163059.51	RES	1.08E-03	1.48E-03	3.74E-07	1.55E-06	9.25E-09	1.91E-07	2.0E-07	0.200577465	2.96E-04	1057	551029	4163059.51
1058	551049	4163059.51	RES	1.00E-03	1.37E-03	3.46E-07	1.43E-06	8.57E-09	1.77E-07	1.9E-07	0.185671996	2.74E-04	1058	551049	4163059.51
1059	551069	4163059.51	RES	9.30E-04	1.28E-03	3.22E-07	1.34E-06	7.97E-09	1.65E-07	1.7E-07	0.173437669	2.56E-04	1059	551069	4163059.51
1060	551089	4163059.51	RES	8.70E-04	1.19E-03	3.01E-07	1.24E-06	7.45E-09	1.54E-07	1.6E-07	0.161289017	2.38E-04	1060	551089	4163059.51
1061	551109	4163059.51	RES	8.10E-04	1.11E-03	2.80E-07	1.16E-06	6.94E-09	1.43E-07	1.5E-07	0.150433099	2.22E-04	1061	551109	4163059.51
1062	549909	4163079.51	RES	5.20E-04	7.30E-04	1.80E-07	7.63E-07	7.07E-09	1.50E-07	1.6E-07	0.156864521	1.46E-04	1062	549909	4163079.51
1063	549929	4163079.51	RES	5.80E-04	8.00E-04	2.01E-07	8.36E-07	7.89E-09	1.64E-07	1.7E-07	0.17204418	1.60E-04	1063	549929	4163079.51
1064	549969	4163079.51	RES	7.00E-04	9.80E-04	2.42E-07	1.02E-06	9.52E-09	2.01E-07	2.1E-07	0.210611328	1.96E-04	1064	549969	4163079.51
1065	549989	4163079.51	RES	7.70E-04	1.08E-03	2.67E-07	1.13E-06	1.05E-08	2.22E-07	2.3E-07	0.232082852	2.16E-04	1065	549989	4163079.51
1066	550009	4163079.51	RES	8.30E-04	1.17E-03	2.87E-07	1.22E-06	1.13E-08	2.40E-07	2.5E-07	0.251366426	2.34E-04	1066	550009	4163079.51
1067	550029	4163079.51	RES	9.00E-04	1.26E-03	3.12E-07	1.32E-06	1.22E-08	2.59E-07	2.7E-07	0.270785993	2.52E-04	1067	550029	4163079.51
1068	550049	4163079.51	RES	9.70E-04	1.35E-03	3.36E-07	1.41E-06	1.32E-08	2.77E-07	2.9E-07	0.29020556	2.70E-04	1068	550049	4163079.51
1069	550069	4163079.51	RES	1.04E-03	1.46E-03	3.60E-07	1.53E-06	1.41E-08	3.00E-07	3.1E-07	0.313729041	2.92E-04	1069	550069	4163079.51
1070	550089	4163079.51	RES	1.13E-03	1.59E-03	3.91E-07	1.66E-06	1.54E-08	3.26E-07	3.4E-07	0.341628423	3.18E-04	1070	550089	4163079.51
1071	550109	4163079.51	RES	1.24E-03	1.75E-03	4.29E-07	1.83E-06	1.69E-08	3.59E-07	3.8E-07	0.375955663	3.50E-04	1071	550109	4163079.51
1072	550129	4163079.51	RES	1.37E-03	1.93E-03	4.74E-07	2.02E-06	1.17E-08	2.49E-07	2.6E-07	0.261235047	3.86E-04	1072	550129	4163079.51
1073	550149	4163079.51	RES	1.53E-03	2.16E-03	5.30E-07	2.26E-06	1.31E-08	2.79E-07	2.9E-07	0.292338718	4.32E-04	1073	550149	4163079.51
1074	550169	4163079.51	RES	1.70E-03	2.39E-03	5.88E-07	2.50E-06	2.31E-08	4.90E-07	5.1E-07	0.51353661	4.78E-04	1074	550169	4163079.51
1075	550189	4163079.51	RES	1.86E-03	2.63E-03	6.44E-07	2.75E-06	2.53E-08	5.40E-07	5.6E-07	0.564959474	5.26E-04	1075	550189	4163079.51
1076	550209	4163079.51	RES	2.08E-03	2.93E-03	7.20E-07	3.06E-06	2.83E-08	6.01E-07	6.3E-07	0.629510039	5.86E-04	1076	550209	4163079.51
1077	550229	4163079.51	RES	2.34E-03	3.30E-03	8.10E-07	3.45E-06	3.18E-08	6.77E-07	7.1E-07	0.708968278	6.60E-04	1077	550229	4163079.51
1078	550289	4163079.51	RES	3.33E-03	4.72E-03	1.15E-06	4.93E-06	4.53E-08	9.69E-07	1.0E-06	1.013809525	9.44E-04	1078	550289	4163079.51
1079	550309	4163079.51	RES	3.98E-03	5.65E-03	1.38E-06	5.91E-06	5.41E-08	1.16E-06	1.2E-06	1.213481101	1.13E-03	1079	550309	4163079.51
1080	550329	4163079.51	RES	4.85E-03	6.89E-03	1.68E-06	7.20E-06	6.60E-08	1.41E-06	1.5E-06	1.479755199	1.38E-03	1080	550329	4163079.51
1081	550909	4163079.51	RES	1.77E-03	2.42E-03	6.13E-07	2.53E-06	1.52E-08	3.13E-07	3.3E-07	0.328005993	4.84E-04	1081	550909	4163079.51
1082	550929	4163079.51	RES	1.60E-03	2.19E-03	5.54E-07	2.29E-06	1.37E-08	2.83E-07	3.0E-07	0.296816647	4.38E-04	1082	550929	4163079.51
1083	550949	4163079.51	RES	1.46E-03	2.00E-03	5.05E-07	2.09E-06	1.25E-08	2.59E-07	2.7E-07	0.271055259	4.00E-04	1083	550949	4163079.51
1084	550969	4163079.51	RES	1.33E-03	1.82E-03	4.60E-07	1.90E-06	1.14E-08	2.35E-07	2.5E-07	0.24667228	3.64E-04	1084	550969	4163079.51
1085	550989	4163079.51	RES	1.22E-03	1.67E-03	4.22E-07	1.75E-06	1.05E-08	2.16E-07	2.3E-07	0.226338852	3.34E-04	1085	550989	4163079.51
1086	551009	4163079.51	RES	1.13E-03	1.54E-03	3.91E-07	1.61E-06	9.68E-09	1.99E-07	2.1E-07	0.208762241	3.08E-04	1086	551009	4163079.51
1087	551029	4163079.51	RES	1.04E-03	1.42E-03	3.60E-07	1.48E-06	8.91E-09	1.84E-07	1.9E-07	0.192478364	2.84E-04	1087	551029	4163079.51
1088	551049	4163079.51	RES	9.70E-04	1.32E-03	3.36E-07	1.38E-06	8.31E-09	1.71E-07	1.8E-07	0.178951303	2.64E-04	1088	551049	4163079.51
1089	551069	4163079.51	RES	9.00E-04	1.22E-03	3.12E-07	1.28E-06	7.71E-09	1.58E-07	1.7E-07	0.165424243	2.44E-04	1089	551069	4163079.51
1090	551089	4163079.51	RES	8.40E-04	1.14E-03	2.91E-07	1.19E-06	7.20E-09	1.47E-07	1.5E-07	0.154568325	2.28E-04	1090	551089	4163079.51
1091	551109	4163079.51	RES	7.80E-04	1.06E-03	2.70E-07	1.11E-06	6.68E-09	1.37E-07	1.4E-07	0.143712406	2.12E-04	1091	551109	4163079.51
1092	549909	4163099.51	RES	5.10E-04	7.10E-04	1.77E-07	7.42E-07	6.94E-09	1.46E-07	1.5E-07	0.152624613	1.42E-04	1092	549909	4163099.51
1093	549929	4163099.51	RES	5.60E-04	7.80E-04	1.94E-07	8.15E-07	7.62E-09	1.60E-07	1.7E-07	0.167668279	1.56E-04	1093	549929	4163099.51
1094	549949	4163099.51	RES	6.20E-04	8.70E-04	2.15E-07	9.09E-07	8.43E-09	1.79E-07	1.9E-07	0.186951853	1.74E-04	1094	549949	4163099.51
1095	549969	4163099.51	RES	6.80E-04	9.50E-04	2.35E-07	9.93E-07	9.25E-09	1.95E-07	2.0E-07	0.20418347	1.90E-04	1095	549969	4163099.51
1096	549989	4163099.51	RES	7.50E-04	1.04E-03	2.60E-07	1.09E-06	1.02E-08	2.13E-07	2.2E-07	0.223603037	2.08E-04	1096	549989	4163099.51
1097	550009	4163099.51	RES	8.10E-04	1.13E-03	2.80E-07	1.18E-06	6.94E-09	1.46E-07	1.5E-07	0.153018565	2.26E-04	1097	550009	4163099.51
1098	550029	4163099.51	RES	8.60E-04	1.21E-03	2.98E-07	1.26E-06	7.37E-09	1.56E-07	1.6E-07	0.163788807	2.42E-04	1098	550029	4163099.51
1099	550049	4163099.51	RES	9.10E-04	1.28E-03	3.15E-07	1.34E-06	7.80E-09	1.65E-07	1.7E-07	0.173266317	2.56E-04	1099	550049	4163099.51
1100	550069	4163099.51	RES	9.70E-04	1.35E-03	3.36E-07	1.41E-06	8.31E-09	1.75E-07	1.8E-07	0.182829503	2.70E-04	1100	550069	4163099.51
1101	550089	4163099.51	RES	1.05E-03	1.47E-03	3.63E-07	1.54E-06	9.00E-09	1.90E-07	2.0E-07	0.199027705	2.94E-04	1101	550089	4163099.51
1102	550109	4163099.51	RES	1.15E-03	1.61E-03	3.98E-07	1.68E-06	9.85E-09	2.08E-07	2.2E-07	0.217982724	3.22E-04	1102	550109	4163099.51
1103	550129	4163099.51	RES	1.25E-03	1.75E-03	4.33E-07	1.83E-06	1.07E-08	2.26E-07	2.4E-07	0.236937744	3.50E-04	1103	550129	4163099.51
1104	550149	4163099.51	RES	1.39E-03	1.95E-03	4.81E-07	2.04E-06	1.19E-08	2.52E-07	2.6E-07	0.263991864	3.90E-04	1104	550149	4163099.51
1105	550169	4163099.51	RES	1.57E-03	2.20E-03	5.43E-07	2.30E-06	2.14E-08	4.51E-07	4.7E-07	0.472781512	4.40E-04	1105	550169	4163099.51
1106	550189	4163099.51	RES	1.73E-03	2.43E-03	5.99E-07	2.54E-06	2.35E-08	4.99E-07	5.2E-07	0.522152418	4.86E-04	1106	550189	4163099.51
1107	550209	4163099.51	RES	1.92E-03	2.70E-03	6.65E-07	2.82E-06	2.61E-08	5.54E-07	5.8E-07	0.580139133	5.40E-04	1107	550209	4163099.51
1108	550229	4163099.51	RES	2.17E-03	3.06E-03	7.51E-07	3.20E-06	2.95E-08	6.28E-07	6.6E-07	0.657409422	6.12E-04	1108	550229	4163099.51
1109	550269	4163099.51	RES	2.68E-03	3.78E-03	9.28E-07	3.95E-06	3.64E-08	7.76E-07	8.1E-07	0.812085992	7.56E-04	1109	550269	4163099.51
1110	550289	4163099.51	RES	3.14E-03	4.44E-03	1.09E-06	4.64E-06	4.27E-08	9.11E-07	9.5E-07	0.953770853	8.88E-04	1110	550289	4163099.51
1111	550309	4163099.51	RES	3.76E-03	5.32E-03	1.30E-06	5.56E-06	5.11E-08	1.09E-06	1.1E-06	1.142774663	1.06E-03	1111	550309	4163099.51
1112	550329	4163099.51	RES	4.60E-03	6.53E-03	1.59E-06	6.83E-06	6.26E-08	1.34E-06	1.4E-06	1.402484911	1.31E-03	1112	550329	4163099.51
1113	550349	4163099.51	RES	5.77E-03	8.21E-03	2.00E-06	8.58E-06	7.85E-08	1.68E-06	1.8E-06	1.763124922	1.64E-03	1113	550349	4163099.51
1114	550949	4163099.51	RES	1.40E-03	1.90E-03	4.85E-07	1.99E-06	1.20E-08	2.46E-07	2.6E-07	0.257613875	3.80E-04	1114	550949	4163099.51
1115	550969	4163099.51	RES	1.28E-03	1.74E-03	4.43E-07	1.82E-06	1.10E-08	2.25E-07	2.4E-07	0.235902038	3.48E-04	1115	550969	4163099.51
1116	550989	4163099.51	RES	1.17E-03	1.59E-03	4.05E-07	1.66E-06	1.00E-08	2.06E-07	2.2E-07	0.215568609	3.18E-04	1116	550989	4163099.51
1117	551009	4163099.51	RES	1.08E-03	1.47E-03	3.74E-07	1.54E-06	9.25E-09	1.90E-07	2.0E-07	0.199284732	2.94E-04	1117	551009	4163099.51
1118	551029	4163099.51	RES	1.00E-03	1.36E-03	3.46E-07	1.42E-06	8.57E-09	1.76E-07	1.8E-07	0.184379263	2.72E-04	1118	551029	4163099.51
1119	551049	4163099.51	RES	9.30E-04	1.26E-03	3.22E-07	1.32E-06	7.97E-09	1.63E-07	1.7E-07	0.170852202	2.52E-04	1119	551049	4163099.51
1120	551069	4163099.51	RES	8.60E-04	1.17E-03	2.98E-07	1.22E-06	7.37E-09	1.51E-07	1.6E-07	0.158617875	2.34E-04	1120	551069	4163099.51
1121	551089	4163099.51	RES	8.10E-04	1.09E-03	2.80E-07	1.14E-06	6.94E-09	1.41E-07	1.5E-07	0.147847632	2.18E-04	1121	551089	4163099.51
1122	551109	4163099.51	RES	7.50E-04	1.02E-03	2.60E-07	1.07E-06	6.43E-09	1.32E-07	1.4E-07	0.138284447	2.04E-04	1122	551109	4163099.51
1123	549909	4163119.51	RES	4.90E-04	6.90E-04	1.70E-07	7.21E-07	6.66E-09	1.42E-07	1.5E-07	0.148248712	1.38E-04	1123	549909	4163119.51
1124	549949	4163119.51	RES	6.10E-04	8.50E-04	2.11E-07	8.88E-07	8.30E-09	1.74E-07	1.8E-07	0.182711945	1.70E-04	1124	549949	4163119.51
1125	549989	4163119.51	RES	7.20E-04	1.01E-03	2.49E-07	1.06E-06	9.79E-09	2.07E-07	2.2E-07	0.217039186	2.02E-04	1125	549989	4163119.51
1126	550009	4163119.51	RES	7.80E-04	1.09E-03	2.70E-07	1.14E-06	1.06E-08	2.24E-07	2.3E-07	0.234270802	2.18E-04	1126	550009	4163119.51
1127	550029	4163119.51	RES	8.30E-04	1.16E-03	2.87E-07	1.21E-06	7.11E-09	1.50E-07	1.6E-07	0.157068115	2.32E-04	1127	550029	4163119.51
1128	550049	4163119.51	RES	8.60E-04	1.19E-03	2.98E-07	1.24E-06	7.37E-09	1.54E-07	1.6E-07	0.161203341	2.38E-04	1128	550049	4163119.51
1129	550069	4163119.51	RES	8.90E-04	1.24E-03	3.08E-07	1.30E-06	7.63E-09	1.60E-07	1.7E-07	0.167924034	2.48E-04	1129	550069	4163119.51
1130	550089	4163119.51	RES	9.50E-04	1.33E-03	3.29E-07	1.39E-06	8.14E-09	1.72E-07	1.8E-07	0.180072685	2.66E-04	1130	550089	4163119.51
1131	550109	4163119.51	RES	1.06E-03	1.48E-03	3.67E-07	1.55E-06	9.08E-09	1.91E-07	2.0E-07	0.200406113	2.96E-04	1131	550109	4163119.51
1132	550129	4163119.51	RES	1.14E-03	1.59E-03	3.95E-07	1.66E-06	9.77E-09	2.06E-07	2.2E-07	0.215311582	3.18E-04	1132	550129	4163119.51
1133	550149	4163119.51	RES	1.27E-03	1.77E-03	4.40E-07	1.85E-06	1.09E-08	2.29E-07	2.4E-07	0.239694561	3.54E-04	1133	550149	4163119.51
1134	550169	4163119.51	RES	1.45E-03	2.03E-03	5.02E-07	2.12E-06	1.97E-08	4.17E-07	4.4E-07	0.436266322	4.06E-04	1134	550169	4163119.51
1135	550189	4163119.51	RES	1.60E-03	2.24E-03	5.54E-07	2.34E-06	2.18E-08	4.60E-07	4.8E-07	0.48139732	4.48E-04	1135	550189	4163119.51
1136	550209	4163119.51	RES	1.78E-03	2.50E-03	6.16E-07	2.61E-06	2.42E-08	5.13E-07	5.4E-07	0.537196085	5.00E-04	1136	550209	4163119.51
1137	550229	4163119.51	RES	2.01E-03	2.82E-03	6.96E-07	2.95E-06	2.73E-08	5.79E-07	6.1E-07	0.605986558	5.64E-04	1137	550229	4163119.51
1138	550269	4163119.51	RES	2.50E-03	3.53E-03	8.65E-07	3.69E-06	3.40E-08	7.24E-07	7.6E-07	0.758339185	7.06E-04	1138	550269	4163119.51
1139	550289	4163119.51	RES	2.95E-03	4.16E-03	1.02E-06	4.35E-06	4.01E-08	8.54E-07	8.9E-07	0.893732181	8.32E-04	1139	550289	4163119.51
1140	550309	4163119.51	RES	3.54E-03	5.00E-03	1.23E-06	5.23E-06	4.81E-08	1.03E-06	1.1E-06	1.074120183	1.00E-03	1140	550309	4163119.51
1141	550329	4163119.51	RES	4.34E-03	6.16E-03	1.50E-06	6.44E-06	5.90E-08	1.26E-06	1.3E-06	1.323026672	1.23E-03	1141	550329	4163119.51
1142	550349	4163119.51	RES	5.47E-03	7.78E-03	1.89E-06	8.13E-06	7.44E-08	1.60E-06	1.7E-06	1.670810967	1.56E-03	1142	550349	4163119.51
1143	550969	4163119.51	RES	1.21E-03	1.64E-03	4.19E-07	1.71E-06	1.04E-08	2.12E-07	2.2E-07	0.222374977	3.28E-04	1143	550969	4163119.51
1144	550989	4163119.51	RES	1.12E-03	1.51E-03	3.88E-07	1.58E-06	9.60E-09	1.95E-07	2.0E-07	0.204798367	3.02E-04	1144	550989	4163119.51
1145	551009	4163119.51	REC	1.03E-03	1.39E-03	3.57E-07	1.45E-06	8.82E-09	1.80E-07	1.9E-07	0.188514489	2.78E-04	1145	551009	4163119.51

1146	551029	4163119.51	REC	9.50E-04	1.29E-03	3.29E-07	1.35E-06	8.14E-09	1.67E-07	1.7E-07	0.174901753	2.58E-04	1146	551029	4163119.51
1147	551049	4163119.51	REC	8.90E-04	1.20E-03	3.08E-07	1.25E-06	7.63E-09	1.55E-07	1.6E-07	0.162753101	2.40E-04	1147	551049	4163119.51
1148	551069	4163119.51	REC	8.30E-04	1.12E-03	2.87E-07	1.17E-06	7.11E-09	1.45E-07	1.5E-07	0.151897183	2.24E-04	1148	551069	4163119.51
1149	551089	4163119.51	REC	7.70E-04	1.04E-03	2.67E-07	1.09E-06	6.60E-09	1.34E-07	1.4E-07	0.141041264	2.08E-04	1149	551089	4163119.51
1150	551109	4163119.51	REC	7.20E-04	9.80E-04	2.49E-07	1.02E-06	6.17E-09	1.27E-07	1.3E-07	0.132856488	1.96E-04	1150	551109	4163119.51
1151	549949	4163139.51	RES	6.00E-04	8.30E-04	2.08E-07	8.68E-07	8.16E-09	1.70E-07	1.8E-07	0.178472038	1.66E-04	1151	549949	4163139.51
1152	549969	4163139.51	RES	6.50E-04	9.00E-04	2.25E-07	9.41E-07	8.84E-09	1.85E-07	1.9E-07	0.193515704	1.80E-04	1152	549969	4163139.51
1153	549989	4163139.51	RES	7.00E-04	9.70E-04	2.42E-07	1.01E-06	9.52E-09	1.99E-07	2.1E-07	0.20855937	1.94E-04	1153	549989	4163139.51
1154	550009	4163139.51	RES	7.50E-04	1.05E-03	2.60E-07	1.10E-06	1.02E-08	2.15E-07	2.3E-07	0.225654994	2.10E-04	1154	550009	4163139.51
1155	550029	4163139.51	REC	8.10E-04	1.12E-03	2.80E-07	1.17E-06	6.94E-09	1.45E-07	1.5E-07	0.151725832	2.24E-04	1155	550029	4163139.51
1156	550049	4163139.51	REC	8.40E-04	1.16E-03	2.91E-07	1.21E-06	7.20E-09	1.50E-07	1.6E-07	0.157153791	2.32E-04	1156	550049	4163139.51
1157	550069	4163139.51	REC	8.60E-04	1.20E-03	2.98E-07	1.25E-06	7.37E-09	1.55E-07	1.6E-07	0.162496074	2.40E-04	1157	550069	4163139.51
1158	550089	4163139.51	REC	9.00E-04	1.25E-03	3.12E-07	1.31E-06	7.71E-09	1.62E-07	1.7E-07	0.169302442	2.50E-04	1158	550089	4163139.51
1159	550109	4163139.51	REC	9.70E-04	1.34E-03	3.36E-07	1.40E-06	8.31E-09	1.73E-07	1.8E-07	0.18153677	2.68E-04	1159	550109	4163139.51
1160	550129	4163139.51	REC	1.05E-03	1.46E-03	3.63E-07	1.53E-06	9.00E-09	1.89E-07	2.0E-07	0.197734972	2.92E-04	1160	550129	4163139.51
1161	550149	4163139.51	REC	1.17E-03	1.63E-03	4.05E-07	1.70E-06	1.00E-08	2.11E-07	2.2E-07	0.220739542	3.26E-04	1161	550149	4163139.51
1162	550169	4163139.51	RES	1.33E-03	1.86E-03	4.60E-07	1.94E-06	1.81E-08	3.82E-07	4.0E-07	0.399751131	3.72E-04	1162	550169	4163139.51
1163	550189	4163139.51	RES	1.47E-03	2.06E-03	5.09E-07	2.15E-06	2.00E-08	4.23E-07	4.4E-07	0.442694179	4.12E-04	1163	550189	4163139.51
1164	550209	4163139.51	RES	1.64E-03	2.30E-03	5.68E-07	2.40E-06	2.23E-08	4.72E-07	4.9E-07	0.494253036	4.60E-04	1164	550209	4163139.51
1165	550229	4163139.51	RES	1.85E-03	2.60E-03	6.40E-07	2.72E-06	2.52E-08	5.34E-07	5.6E-07	0.558667609	5.20E-04	1165	550229	4163139.51
1166	550269	4163139.51	RES	2.33E-03	3.28E-03	8.07E-07	3.43E-06	3.17E-08	6.73E-07	7.0E-07	0.704728371	6.56E-04	1166	550269	4163139.51
1167	550289	4163139.51	RES	2.75E-03	3.86E-03	9.52E-07	4.03E-06	3.74E-08	7.92E-07	8.3E-07	0.829453602	7.72E-04	1167	550289	4163139.51
1168	550309	4163139.51	RES	3.30E-03	4.65E-03	1.14E-06	4.86E-06	4.49E-08	9.54E-07	1.0E-06	0.999037845	9.30E-04	1168	550309	4163139.51
1169	550329	4163139.51	RES	4.05E-03	5.73E-03	1.40E-06	5.99E-06	5.51E-08	1.18E-06	1.2E-06	1.23084871	1.15E-03	1169	550329	4163139.51
1170	550349	4163139.51	RES	5.11E-03	7.25E-03	1.77E-06	7.58E-06	6.95E-08	1.49E-06	1.6E-06	1.557161481	1.45E-03	1170	550349	4163139.51
1171	551009	4163139.51	REC	9.80E-04	1.32E-03	3.39E-07	1.38E-06	8.40E-09	1.71E-07	1.8E-07	0.179036979	2.64E-04	1171	551009	4163139.51
1172	551029	4163139.51	REC	9.10E-04	1.22E-03	3.15E-07	1.28E-06	7.80E-09	1.58E-07	1.7E-07	0.165509919	2.44E-04	1172	551029	4163139.51
1173	551049	4163139.51	REC	8.40E-04	1.14E-03	2.91E-07	1.19E-06	7.20E-09	1.47E-07	1.5E-07	0.154568325	2.28E-04	1173	551049	4163139.51
1174	551069	4163139.51	REC	7.90E-04	1.06E-03	2.73E-07	1.11E-06	6.77E-09	1.37E-07	1.4E-07	0.143798082	2.12E-04	1174	551069	4163139.51
1175	551089	4163139.51	REC	7.40E-04	9.90E-04	2.56E-07	1.03E-06	6.34E-09	1.28E-07	1.3E-07	0.134320572	1.98E-04	1175	551089	4163139.51
1176	549949	4163159.51	RES	5.80E-04	8.00E-04	2.01E-07	8.36E-07	7.89E-09	1.64E-07	1.7E-07	0.17204418	1.60E-04	1176	549949	4163159.51
1177	549969	4163159.51	RES	6.20E-04	8.70E-04	2.15E-07	9.09E-07	8.43E-09	1.79E-07	1.9E-07	0.186951853	1.74E-04	1177	549969	4163159.51
1178	549989	4163159.51	RES	6.70E-04	9.40E-04	2.32E-07	9.82E-07	9.11E-09	1.93E-07	2.0E-07	0.201995519	1.88E-04	1178	549989	4163159.51
1179	550009	4163159.51	RES	7.30E-04	1.01E-03	2.53E-07	1.06E-06	9.93E-09	2.07E-07	2.2E-07	0.217175179	2.02E-04	1179	550009	4163159.51
1180	550029	4163159.51	REC	7.80E-04	1.08E-03	2.70E-07	1.13E-06	6.68E-09	1.40E-07	1.5E-07	0.146297872	2.16E-04	1180	550029	4163159.51
1181	550049	4163159.51	REC	8.10E-04	1.12E-03	2.80E-07	1.17E-06	6.94E-09	1.45E-07	1.5E-07	0.151725832	2.24E-04	1181	550049	4163159.51
1182	550069	4163159.51	REC	8.30E-04	1.15E-03	2.87E-07	1.20E-06	7.11E-09	1.49E-07	1.6E-07	0.155775382	2.30E-04	1182	550069	4163159.51
1183	550089	4163159.51	REC	8.70E-04	1.20E-03	3.01E-07	1.25E-06	7.45E-09	1.55E-07	1.6E-07	0.16258175	2.40E-04	1183	550089	4163159.51
1184	550109	4163159.51	REC	9.20E-04	1.27E-03	3.18E-07	1.33E-06	7.88E-09	1.64E-07	1.7E-07	0.17205926	2.54E-04	1184	550109	4163159.51
1185	550129	4163159.51	REC	9.90E-04	1.37E-03	3.43E-07	1.43E-06	8.48E-09	1.77E-07	1.9E-07	0.18558632	2.74E-04	1185	550129	4163159.51
1186	550149	4163159.51	REC	1.10E-03	1.52E-03	3.81E-07	1.59E-06	9.42E-09	1.96E-07	2.1E-07	0.205919748	3.04E-04	1186	550149	4163159.51
1187	550169	4163159.51	RES	1.23E-03	1.72E-03	4.26E-07	1.80E-06	1.67E-08	3.53E-07	3.7E-07	0.369663799	3.44E-04	1187	550169	4163159.51
1188	550189	4163159.51	RES	1.36E-03	1.90E-03	4.71E-07	1.99E-06	1.85E-08	3.90E-07	4.1E-07	0.408366939	3.80E-04	1188	550189	4163159.51
1189	550209	4163159.51	RES	1.51E-03	2.11E-03	5.23E-07	2.21E-06	2.05E-08	4.33E-07	4.5E-07	0.453497938	4.22E-04	1189	550209	4163159.51
1190	550229	4163159.51	RES	1.70E-03	2.38E-03	5.88E-07	2.49E-06	2.31E-08	4.88E-07	5.1E-07	0.511484653	4.76E-04	1190	550229	4163159.51
1191	550269	4163159.51	RES	2.16E-03	3.02E-03	7.48E-07	3.16E-06	2.94E-08	6.20E-07	6.5E-07	0.6490656	6.04E-04	1191	550269	4163159.51
1192	550289	4163159.51	RES	2.53E-03	3.55E-03	8.76E-07	3.71E-06	3.44E-08	7.28E-07	7.6E-07	0.762851079	7.10E-04	1192	550289	4163159.51
1193	550309	4163159.51	RES	3.02E-03	4.25E-03	1.05E-06	4.44E-06	4.11E-08	8.72E-07	9.1E-07	0.913151748	8.50E-04	1193	550309	4163159.51
1194	550329	4163159.51	RES	3.70E-03	5.23E-03	1.28E-06	5.47E-06	5.03E-08	1.07E-06	1.1E-06	1.123491089	1.05E-03	1194	550329	4163159.51
1195	549949	4163179.51	RES	5.60E-04	7.70E-04	1.94E-07	8.05E-07	7.62E-09	1.58E-07	1.7E-07	0.165616322	1.54E-04	1195	549949	4163179.51
1196	549969	4163179.51	RES	6.00E-04	8.40E-04	2.08E-07	8.78E-07	8.16E-09	1.72E-07	1.8E-07	0.180523995	1.68E-04	1196	549969	4163179.51
1197	549989	4163179.51	RES	6.50E-04	9.00E-04	2.25E-07	9.41E-07	8.84E-09	1.85E-07	1.9E-07	0.193515704	1.80E-04	1197	549989	4163179.51
1198	550009	4163179.51	RES	7.00E-04	9.70E-04	2.42E-07	1.01E-06	9.52E-09	1.99E-07	2.1E-07	0.20855937	1.94E-04	1198	550009	4163179.51
1199	550029	4163179.51	REC	7.50E-04	1.04E-03	2.60E-07	1.09E-06	6.43E-09	1.34E-07	1.4E-07	0.140869913	2.08E-04	1199	550029	4163179.51
1200	550049	4163179.51	REC	7.70E-04	1.06E-03	2.67E-07	1.11E-06	6.60E-09	1.37E-07	1.4E-07	0.143626731	2.12E-04	1200	550049	4163179.51
1201	550069	4163179.51	REC	7.90E-04	1.09E-03	2.73E-07	1.14E-06	6.77E-09	1.41E-07	1.5E-07	0.147676281	2.18E-04	1201	550069	4163179.51
1202	550089	4163179.51	REC	8.30E-04	1.14E-03	2.87E-07	1.19E-06	7.11E-09	1.47E-07	1.5E-07	0.154482649	2.28E-04	1202	550089	4163179.51
1203	550109	4163179.51	REC	8.70E-04	1.20E-03	3.01E-07	1.25E-06	7.45E-09	1.55E-07	1.6E-07	0.16258175	2.40E-04	1203	550109	4163179.51
1204	550129	4163179.51	REC	9.40E-04	1.29E-03	3.25E-07	1.35E-06	8.05E-09	1.67E-07	1.7E-07	0.174816077	2.58E-04	1204	550129	4163179.51
1205	550149	4163179.51	REC	1.03E-03	1.42E-03	3.57E-07	1.48E-06	8.82E-09	1.84E-07	1.9E-07	0.192392688	2.84E-04	1205	550149	4163179.51
1206	550169	4163179.51	RES	1.15E-03	1.59E-03	3.98E-07	1.66E-06	1.56E-08	3.26E-07	3.4E-07	0.34190041	3.18E-04	1206	550169	4163179.51
1207	550189	4163179.51	RES	1.26E-03	1.75E-03	4.36E-07	1.83E-06	1.71E-08	3.59E-07	3.8E-07	0.37622765	3.50E-04	1207	550189	4163179.51
1208	550209	4163179.51	RES	1.40E-03	1.95E-03	4.85E-07	2.04E-06	1.90E-08	4.00E-07	4.2E-07	0.419170698	3.90E-04	1208	550209	4163179.51
1209	550229	4163179.51	RES	1.57E-03	2.18E-03	5.43E-07	2.28E-06	2.14E-08	4.47E-07	4.7E-07	0.468677598	4.36E-04	1209	550229	4163179.51
1210	550269	4163179.51	RES	1.98E-03	2.76E-03	6.85E-07	2.88E-06	2.69E-08	5.66E-07	5.9E-07	0.593266835	5.52E-04	1210	550269	4163179.51
1211	550289	4163179.51	RES	2.30E-03	3.22E-03	7.96E-07	3.37E-06	3.13E-08	6.61E-07	6.9E-07	0.692008648	6.44E-04	1211	550289	4163179.51
1212	550309	4163179.51	RES	2.73E-03	3.83E-03	9.45E-07	4.00E-06	3.71E-08	7.86E-07	8.2E-07	0.823025744	7.66E-04	1212	550309	4163179.51
1213	550329	4163179.51	RES	3.32E-03	4.66E-03	1.15E-06	4.87E-06	4.51E-08	9.56E-07	1.0E-06	1.001361788	9.32E-04	1213	550329	4163179.51
1214	549949	4163199.51	RES	5.40E-04	7.40E-04	1.87E-07	7.73E-07	7.34E-09	1.52E-07	1.6E-07	0.159188464	1.48E-04	1214	549949	4163199.51
1215	549969	4163199.51	RES	5.80E-04	8.10E-04	2.01E-07	8.47E-07	7.89E-09	1.66E-07	1.7E-07	0.174096137	1.62E-04	1215	549969	4163199.51
1216	549989	4163199.51	RES	6.30E-04	8.70E-04	2.18E-07	9.09E-07	8.57E-09	1.79E-07	1.9E-07	0.187087846	1.74E-04	1216	549989	4163199.51
1217	550009	4163199.51	REC	6.70E-04	9.40E-04	2.32E-07	9.82E-07	5.74E-09	1.22E-07	1.3E-07	0.127257177	1.88E-04	1217	550009	4163199.51
1218	550029	4163199.51	REC	7.10E-04	9.90E-04	2.46E-07	1.03E-06	6.08E-09	1.28E-07	1.3E-07	0.134063545	1.98E-04	1218	550029	4163199.51
1219	550049	4163199.51	REC	7.40E-04	1.02E-03	2.56E-07	1.07E-06	6.34E-09	1.32E-07	1.4E-07	0.138198771	2.04E-04	1219	550049	4163199.51
1220	550069	4163199.51	REC	7.60E-04	1.04E-03	2.63E-07	1.09E-06	6.51E-09	1.34E-07	1.4E-07	0.140955589	2.08E-04	1220	550069	4163199.51
1221	550089	4163199.51	REC	7.90E-04	1.09E-03	2.73E-07	1.14E-06	6.77E-09	1.41E-07	1.5E-07	0.147676281	2.18E-04	1221	550089	4163199.51
1222	550109	4163199.51	REC	8.30E-04	1.15E-03	2.87E-07	1.20E-06	7.11E-09	1.49E-07	1.6E-07	0.155775382	2.30E-04	1222	550109	4163199.51
1223	550129	4163199.51	REC	8.90E-04	1.22E-03	3.08E-07	1.28E-06	7.63E-09	1.58E-07	1.7E-07	0.165338568	2.44E-04	1223	550129	4163199.51
1224	550149	4163199.51	RES	9.70E-04	1.33E-03	3.36E-07	1.39E-06	8.31E-09	1.72E-07	1.8E-07	0.180244037	2.66E-04	1224	550149	4163199.51
1225	550169	4163199.51	RES	1.07E-03	1.47E-03	3.70E-07	1.54E-06	1.46E-08	3.02E-07	3.2E-07	0.316188978	2.94E-04	1225	550169	4163199.51
1226	550189	4163199.51	RES	1.17E-03	1.62E-03	4.05E-07	1.69E-06	1.59E-08	3.32E-07	3.5E-07	0.348328267	3.24E-04	1226	550189	4163199.51
1227	550209	4163199.51	RES	1.29E-03	1.79E-03	4.47E-07	1.87E-06	1.75E-08	3.67E-07	3.8E-07	0.384843458	3.58E-04	1227	550209	4163199.51
1228	550229	4163199.51	RES	1.44E-03	1.99E-03	4.98E-07	2.08E-06	1.96E-08	4.08E-07	4.3E-07	0.4279225	3.98E-04	1228	550229	4163199.51
1229	550269	4163199.51	RES	1.80E-03	2.50E-03	6.23E-07	2.61E-06	2.45E-08	5.13E-07	5.4E-07	0.537468071	5.00E-04	1229	550269	4163199.51
1230	550289	4163199.51	RES	2.08E-03	2.89E-03	7.20E-07	3.02E-06	2.83E-08	5.93E-07	6.2E-07	0.621302211	5.78E-04	1230	550289	4163199.51
1231	550309	4163199.51	RES	2.43E-03	3.40E-03	8.41E-07	3.55E-06	3.30E-08	6.98E-07	7.3E-07	0.730711789	6.80E-04	1231	550309	4163199.51
1232	550329	4163199.51	RES	2.91E-03	4.08E-03	1.01E-06	4.26E-06	3.96E-08	8.37E-07	8.8E-07	0.876772551	8.16E-04	1232	550329	4163199.51
1233	549929	4163219.51	RES	4.80E-04	6.60E-04	1.66E-07	6.90E-07	6.53E-09	1.35E-07	1.4E-07	0.141956847	1.32E-04	1233	549929	4163219.51
1234	549949	4163219.51	RES	5.20E-04	7.10E-04	1.80E-07	7.42E-07	7.07E-09	1.46E-07	1.5E-07	0.152760606	1.42E-04	1234	549949	4163219.51
1235	549969	4163219.51	RES	5.60E-04	7.70E-04	1.94E-07	8.05E-07	7.62E-09	1.58E-07	1.7E-07	0.165616322	1.54E-04	1235	549969	4163219.51
1236	549989	4163219.51	RES	6.10E-04	8.40E-04	2.11E-07	8.78E-07	8.30E-09	1.72E-07	1.8E-07	0.180659988	1.68E-04	1236	549989	4163219.51
1237	550009	4163219.51	RES	6.50E-04	9.00E-04	2.25E-07	9.41E-07	5.57E-09	1.16E-07	1.2E-07	0.121914894	1.80E-04	1237	550009	4163219.51
1238	550029	4163219.51	REC	6.80E-04	9.40E-04	2.35E-07	9.82E-07	5.83E-09	1.22E-07	1.3E-07	0.127342853	1.88E-04	1238	550029	4163219.51
1239	550049	4163219.51	REC	7.10E-04	9.80E-04	2.46E-07	1.02E-06	6.08E-09	1.27E-07	1.3E-07	0.132770812	1.96E-04	1239	550049	4163219.51
1240	550069	4163219.51	REC	7.40E-04	1.01E-03	2.56E-07	1.06E-06	6.34E-09	1.31E-07	1.4E-07	0.136906038	2.02E-04	1240	550069	4163219.51
1241	550089	4163219.51	REC	7.70E-04	1.06E-03	2.67E-07	1.11E-06	6.60E-09	1.37E-07	1.4E-07	0.143626731	2.12E-04	1241	550089	4163219.51
1242	550109	4163219.51	REC	8.00E-04	1.10E-03	2.77E-07	1.15E-06	6.85E-09	1.42E-07	1.5E-07	0.14905469	2.20E-04	1242	550109	4163219.51
1243	550129	4163219.51	REC	8.50E-04	1.16E-03	2.94E-07	1.21E-06	7.28E-09	1.50E-07	1.6E-07	0.157239467	2.32E-04	1243	550129	4163219.51
1244	550149	4163219.51	RES	9.10E-04	1.25E-03	3.15E-07	1.31E-06	7.80E-09	1.62E-07	1.7E-07	0.169388118	2.50E-04	1244	550149	4163219.51
1245	550169	4163219.51	RES	1.00E-03	1.37E-03	3.46E-07	1.43E-06	1.36E-08	2.81E-07	2.9E-07	0.294717454	2.74E-04	1245	550169	4163219.51
1246	550189	4163219.51	RES	1.09E-03	1.50E-03	3.77E-07	1.57E-06	1.48E-08	3.08E-07	3.2E-07	0.322616836	3.00E-04	1246	550189	4163219.51
1247	550209	4163219.51	RES	1.19E-03	1.65E-03	4.12E-07	1.72E-06	1.62E-08	3.39E-07	3.5E-07	0.354756125	3.30E-04	1247	550209	4163219.51
1248	550229	4163219.51	RES	1.32E-03	1.82E-03	4.57E-07	1.90E-06	1.80E-08	3.73E-07	3.9E-07	0.391407309	3.64E-04	1248	550229	4163219.51
1249	550269	4163219.51	RES	1.64E-03	2.26E-03	5.68E-07	2.36E-06	2.23E-08	4.64E-07	4.9E-07	0.486045207	4.52E-04	1249	550269	4163219.51
1250	550289	4163219.51	RES	1.86E-03	2.58E-03	6.44E-07	2.70E-06	2.53E-08	5.29E-07	5.5E-07	0.554699688	5.16E-04	1250	550289	4163219.51
1251	550309	4163219.51	RES	2.15E-03	2.99E-03	7.44E-07	3.13E-06	2.92E-08	6.14E-07	6.4E-07	0.642773735	5.98E-04	1251	550309	4163219.51
1252	550329	4163219.51	RES	2.53E-03	3.53E-03	8.76E-07	3.69E-06	3.44E-08	7.24E-07	7.6E-07	0.758747164	7.06E-04	1252	550329	4163219.51
1253	549909	4163239.51	RES	4.20E-04	5.80E-04	1.45E-07	6.06E-07	5.71E-09	1.19E-07	1.2E-07	0.124725231	1.16E-04	1253	549909	4163239.51
1254	549929	4163239.51	RES	4.60E-04	6.30E-04	1.59E-07	6.58E-07	6.26E-09	1.29E-07	1.4E-07	0.135528989	1.26E-04	1254	549929	4163239.51
1255	549969	4163239.51	RES	5.40E-04	7.40E-04	1.87E-07	7.73E-07	7.34E-09	1.52E-07	1.6E-07	0.159188464	1.48E-04	1255	549969	4163239.51
1256	549989	4163239.51	RES	5.80E-04	8.10E-04	2.01E-07	8.47E-07	4.97E-09	1.05E-07	1.1E-07	0.109680566	1.62E-04	1256	549989	4163239.51
1257	550009	4163239.51	RES	6.20E-04	8.60E-04	2.15E-07	8.99E-07	5.31E-09	1.11E-07	1.2E-07	0.116486934	1.72E-04	1257	550009	4163239.51
1258	550029	4163239.51	REC	6.50E-04	8.90E-04	2.25E-07	9.30E-07	5.57E-09	1.15E-07	1.2E-07	0.120622161	1.78E-04	1258	550029	4163239.51
1259	550049	4163239.51	REC	6.80E-04	9.40E-04	2.35E-07	9.82E-07	5.83E-09	1.22E-07	1.3E-07	0.127342853	1.88E-04	1259	550049	4163239.51
1260	550069	4163239.51	REC	7.10E-04	9.80E-04	2.46E-07	1.02E-06	6.08E-09	1.27E-07	1.3E-07	0.132770812	1.96E-04	1260	550069	4163239.51
1261	550089	4163239.51	REC	7.40E-04	1.02E-03	2.56E-07	1.07E-06	6.34E-09	1.32E-07	1.4E-07	0.138198771	2.04E-04	1261	550089	4163239.51
1262	550149	4163239.51	REC	8.70E-04	1.18E-03	3.01E-07	1.23E-06	7.45E-09	1.53E-07	1.6E-07	0.159996284	2.36E-04	1262	550149	4163239.51
1263	550169	4163239.51	RES	9.30E-04	1.27E-03	3.22E-07	1.33E-06	1.26E-08	2.61E-07	2.7E-07	0.273245929	2.54E-04	1263	550169	4163239.51
1264	550189	4163239.51	RES	1.01E-03	1.38E-03	3.50E-07	1.44E-06	1.37E-08	2.83E-07	3.0E-07	0.296905404	2.76E-04	1264	550189	4163239.51
1265	550209	4163239.51	RES	1.10E-03	1.51E-03	3.81E-07	1.58E-06	1.50E-08	3.10E-07	3.2E-07	0.324804786	3.02E-04	1265	550209	4163239.51
1266	550229	4163239.51	RES	1.21E-03	1.66E-03	4.19E-07	1.74E-06	1.65E-08	3.41E-07	3.6E-07	0.357080069	3.32E-04	1266	550229	4163239.51
1267	550249	4163239.51	RES	1.33E-03	1.82E-03	4.60E-07	1.90E-06	1.81E-08	3.73E-07	3.9E-07	0.391543302	3.64E-04	1267	550249	4163239.51
1268	550269	4163239.51	RES	1.48E-03	2.04E-03	5.12E-07	2.13E-06	2.01E-08	4.19E-07	4.4E-07	0.438726258	4.08E-04	1268	550269	4163239.51
1269	550309	4163239.51	RES	1.91E-03	2.63E-03	6.61E-07	2.75E-06	2.60E-08	5.40E-07	5.7E-07	0.565639439	5.26E-04	1269	550309	4163239.51
1270	550329	4163239.51	RES	2.20E-03	3.05E-03	7.62E-07	3.19E-06	2.99E-08	6.26E-07	6.6E-07	0.655765444	6.10E-04	1270	550329	4163239.51
1271	550689	4163239.51	WOR	4.10E-03	5.17E-03	6.46E-07	8.14E-07	6.40E-08	0	6.4E-08	0.064001546	1.03E-03	1271	550689	4163239.51
1272	550709	4163239.51	WOR	3.34E-03	4.26E-03	5.26E-07	6.71E-07	5.21E-08	0.00E+00	5.2E-08	0.052137845	8.52E-04	1272	550709	4163239.51
1273	549909	4163259.51	RES	4.10E-04	5.70E-04	1.42E-07	5.96E-07	5.58E-09	1.17E-07	1.2E-07	0.12253728	1.14E-04	1273	549909	4163259.51

1274	549949	4163259.51	RES	4.80E-04	6.60E-04	1.66E-07	6.90E-07	6.53E-09	1.35E-07	1.4E-07	0.141956847	1.32E-04	1274	549949	4163259.51
1275	549969	4163259.51	RES	5.30E-04	7.20E-04	1.83E-07	7.53E-07	7.21E-09	1.48E-07	1.5E-07	0.154948556	1.44E-04	1275	549969	4163259.51
1276	549989	4163259.51	REC	5.60E-04	7.80E-04	1.94E-07	8.15E-07	4.80E-09	1.01E-07	1.1E-07	0.105631016	1.56E-04	1276	549989	4163259.51
1277	550009	4163259.51	REC	6.00E-04	8.20E-04	2.08E-07	8.57E-07	5.14E-09	1.06E-07	1.1E-07	0.111144651	1.64E-04	1277	550009	4163259.51
1278	550029	4163259.51	REC	6.10E-04	8.40E-04	2.11E-07	8.78E-07	5.23E-09	1.09E-07	1.1E-07	0.113815793	1.68E-04	1278	550029	4163259.51
1279	550049	4163259.51	REC	6.40E-04	8.70E-04	2.22E-07	9.09E-07	5.48E-09	1.12E-07	1.2E-07	0.117951019	1.74E-04	1279	550049	4163259.51
1280	550069	4163259.51	REC	6.70E-04	9.20E-04	2.32E-07	9.62E-07	5.74E-09	1.19E-07	1.2E-07	0.124671711	1.84E-04	1280	550069	4163259.51
1281	550089	4163259.51	REC	7.00E-04	9.60E-04	2.42E-07	1.00E-06	6.00E-09	1.24E-07	1.3E-07	0.13009967	1.92E-04	1281	550089	4163259.51
1282	550129	4163259.51	RES	7.70E-04	1.05E-03	2.67E-07	1.10E-06	1.05E-08	2.15E-07	2.3E-07	0.22592698	2.10E-04	1282	550129	4163259.51
1283	550149	4163259.51	RES	8.20E-04	1.11E-03	2.84E-07	1.16E-06	7.03E-09	1.43E-07	1.5E-07	0.150518774	2.22E-04	1283	550149	4163259.51
1284	550169	4163259.51	REC	8.80E-04	1.19E-03	3.05E-07	1.24E-06	7.54E-09	1.54E-07	1.6E-07	0.161374693	2.38E-04	1284	550169	4163259.51
1285	550209	4163259.51	RES	1.02E-03	1.39E-03	3.53E-07	1.45E-06	1.39E-08	2.85E-07	3.0E-07	0.299093354	2.78E-04	1285	550209	4163259.51
1286	550229	4163259.51	RES	1.11E-03	1.51E-03	3.84E-07	1.58E-06	1.51E-08	3.10E-07	3.2E-07	0.324940779	3.02E-04	1286	550229	4163259.51
1287	550249	4163259.51	RES	1.21E-03	1.65E-03	4.19E-07	1.72E-06	1.65E-08	3.39E-07	3.6E-07	0.355028112	3.30E-04	1287	550249	4163259.51
1288	550269	4163259.51	RES	1.34E-03	1.83E-03	4.64E-07	1.91E-06	1.82E-08	3.76E-07	3.9E-07	0.393731253	3.66E-04	1288	550269	4163259.51
1289	550289	4163259.51	RES	1.49E-03	2.04E-03	5.16E-07	2.13E-06	2.03E-08	4.19E-07	4.4E-07	0.438862251	4.08E-04	1289	550289	4163259.51
1290	550309	4163259.51	RES	1.68E-03	2.30E-03	5.82E-07	2.40E-06	2.28E-08	4.72E-07	4.9E-07	0.494797009	4.60E-04	1290	550309	4163259.51
1291	550689	4163259.51	WOR	3.41E-03	4.15E-03	5.37E-07	6.54E-07	5.32E-08	0.00E+00	5.3E-08	0.053230554	8.30E-04	1291	550689	4163259.51
1292	550709	4163259.51	WOR	2.80E-03	3.46E-03	4.41E-07	5.45E-07	4.37E-08	0.00E+00	4.4E-08	0.043708373	6.92E-04	1292	550709	4163259.51
1293	550989	4163259.51	RES	7.00E-04	8.80E-04	2.42E-07	9.20E-07	9.52E-09	1.81E-07	1.9E-07	0.190091755	1.76E-04	1293	550989	4163259.51
1294	551009	4163259.51	RES	6.60E-04	8.30E-04	2.28E-07	8.68E-07	8.98E-09	1.70E-07	1.8E-07	0.179287997	1.66E-04	1294	551009	4163259.51
1295	551029	4163259.51	RES	6.20E-04	7.80E-04	2.15E-07	8.15E-07	8.43E-09	1.60E-07	1.7E-07	0.168484238	1.56E-04	1295	551029	4163259.51
1296	549909	4163279.51	RES	4.00E-04	5.60E-04	1.38E-07	5.85E-07	5.44E-09	1.15E-07	1.2E-07	0.12034933	1.12E-04	1296	549909	4163279.51
1297	549929	4163279.51	RES	4.30E-04	5.90E-04	1.49E-07	6.17E-07	5.85E-09	1.21E-07	1.3E-07	0.126913181	1.18E-04	1297	549929	4163279.51
1298	549949	4163279.51	RES	4.60E-04	6.40E-04	1.59E-07	6.69E-07	6.26E-09	1.31E-07	1.4E-07	0.137580947	1.28E-04	1298	549949	4163279.51
1299	550009	4163279.51	REC	5.70E-04	7.70E-04	1.97E-07	8.05E-07	4.88E-09	9.95E-08	1.0E-07	0.104423959	1.54E-04	1299	550009	4163279.51
1300	550029	4163279.51	REC	5.80E-04	8.00E-04	2.01E-07	8.36E-07	4.97E-09	1.03E-07	1.1E-07	0.108387833	1.60E-04	1300	550029	4163279.51
1301	550049	4163279.51	REC	6.00E-04	8.20E-04	2.08E-07	8.57E-07	5.14E-09	1.06E-07	1.1E-07	0.111144651	1.64E-04	1301	550049	4163279.51
1302	550069	4163279.51	REC	6.30E-04	8.50E-04	2.18E-07	8.88E-07	5.40E-09	1.10E-07	1.2E-07	0.115279877	1.70E-04	1302	550069	4163279.51
1303	550089	4163279.51	REC	6.60E-04	8.90E-04	2.28E-07	9.30E-07	5.65E-09	1.15E-07	1.2E-07	0.120707836	1.78E-04	1303	550089	4163279.51
1304	550109	4163279.51	RES	7.00E-04	9.40E-04	2.42E-07	9.82E-07	9.52E-09	1.93E-07	2.0E-07	0.202403499	1.88E-04	1304	550109	4163279.51
1305	550129	4163279.51	RES	7.30E-04	9.90E-04	2.53E-07	1.03E-06	9.93E-09	2.03E-07	2.1E-07	0.213071264	1.98E-04	1305	550129	4163279.51
1306	550149	4163279.51	RES	7.80E-04	1.05E-03	2.70E-07	1.10E-06	1.06E-08	2.15E-07	2.3E-07	0.226062973	2.10E-04	1306	550149	4163279.51
1307	550169	4163279.51	RES	8.20E-04	1.11E-03	2.84E-07	1.16E-06	1.12E-08	2.28E-07	2.4E-07	0.238918689	2.22E-04	1307	550169	4163279.51
1308	550189	4163279.51	RES	8.80E-04	1.18E-03	3.05E-07	1.23E-06	1.20E-08	2.42E-07	2.5E-07	0.254098349	2.36E-04	1308	550189	4163279.51
1309	550209	4163279.51	RES	9.40E-04	1.27E-03	3.25E-07	1.33E-06	1.28E-08	2.61E-07	2.7E-07	0.273381922	2.54E-04	1309	550209	4163279.51
1310	550229	4163279.51	RES	1.02E-03	1.37E-03	3.53E-07	1.43E-06	1.39E-08	2.81E-07	2.9E-07	0.29498944	2.74E-04	1310	550229	4163279.51
1311	550249	4163279.51	RES	1.11E-03	1.50E-03	3.84E-07	1.57E-06	1.51E-08	3.08E-07	3.2E-07	0.322888822	3.00E-04	1311	550249	4163279.51
1312	550269	4163279.51	RES	1.21E-03	1.64E-03	4.19E-07	1.71E-06	1.65E-08	3.37E-07	3.5E-07	0.352976155	3.28E-04	1312	550269	4163279.51
1313	550289	4163279.51	RES	1.33E-03	1.80E-03	4.60E-07	1.88E-06	1.81E-08	3.69E-07	3.9E-07	0.387439388	3.60E-04	1313	550289	4163279.51
1314	550309	4163279.51	RES	1.47E-03	2.00E-03	5.09E-07	2.09E-06	2.00E-08	4.10E-07	4.3E-07	0.430382436	4.00E-04	1314	550309	4163279.51
1315	550689	4163279.51	WOR	2.82E-03	3.33E-03	4.44E-07	5.25E-07	4.40E-08	0.00E+00	4.4E-08	0.044020576	6.66E-04	1315	550689	4163279.51
1316	550969	4163279.51	RES	6.90E-04	8.50E-04	2.39E-07	8.88E-07	9.38E-09	1.74E-07	1.8E-07	0.183799891	1.70E-04	1316	550969	4163279.51
1317	550989	4163279.51	RES	6.40E-04	8.00E-04	2.22E-07	8.36E-07	8.70E-09	1.64E-07	1.7E-07	0.172860139	1.60E-04	1317	550989	4163279.51
1318	551009	4163279.51	RES	6.10E-04	7.60E-04	2.11E-07	7.94E-07	8.30E-09	1.56E-07	1.6E-07	0.164244331	1.52E-04	1318	551009	4163279.51
1319	551049	4163279.51	RES	5.40E-04	6.80E-04	1.87E-07	7.11E-07	7.34E-09	1.40E-07	1.5E-07	0.146876721	1.36E-04	1319	551049	4163279.51
1320	551069	4163279.51	RES	5.20E-04	6.50E-04	1.80E-07	6.79E-07	7.07E-09	1.33E-07	1.4E-07	0.140448863	1.30E-04	1320	551069	4163279.51
1321	551089	4163279.51	RES	4.90E-04	6.20E-04	1.70E-07	6.48E-07	6.66E-09	1.27E-07	1.3E-07	0.133885012	1.24E-04	1321	551089	4163279.51
1322	551109	4163279.51	RES	4.70E-04	5.90E-04	1.63E-07	6.17E-07	6.39E-09	1.21E-07	1.3E-07	0.127457154	1.18E-04	1322	551109	4163279.51
1323	549909	4163299.51	RES	4.00E-04	5.50E-04	1.38E-07	5.75E-07	5.44E-09	1.13E-07	1.2E-07	0.118297373	1.10E-04	1323	549909	4163299.51
1324	549929	4163299.51	RES	4.30E-04	5.90E-04	1.49E-07	6.17E-07	5.85E-09	1.21E-07	1.3E-07	0.126913181	1.18E-04	1324	549929	4163299.51
1325	549949	4163299.51	RES	4.60E-04	6.30E-04	1.59E-07	6.58E-07	6.26E-09	1.29E-07	1.4E-07	0.135528989	1.26E-04	1325	549949	4163299.51
1326	549969	4163299.51	RES	4.90E-04	6.70E-04	1.70E-07	7.00E-07	6.66E-09	1.37E-07	1.4E-07	0.144144798	1.34E-04	1326	549969	4163299.51
1327	550049	4163299.51	REC	5.80E-04	7.90E-04	2.01E-07	8.26E-07	4.97E-09	1.02E-07	1.1E-07	0.1070951	1.58E-04	1327	550049	4163299.51
1328	550069	4163299.51	REC	6.00E-04	8.10E-04	2.08E-07	8.47E-07	5.14E-09	1.05E-07	1.1E-07	0.109851918	1.62E-04	1328	550069	4163299.51
1329	550089	4163299.51	RES	6.40E-04	8.60E-04	2.22E-07	8.99E-07	8.70E-09	1.76E-07	1.9E-07	0.185171882	1.72E-04	1329	550089	4163299.51
1330	550109	4163299.51	RES	6.60E-04	8.90E-04	2.28E-07	9.30E-07	8.98E-09	1.83E-07	1.9E-07	0.19159974	1.78E-04	1330	550109	4163299.51
1331	550129	4163299.51	RES	7.00E-04	9.40E-04	2.42E-07	9.82E-07	9.52E-09	1.93E-07	2.0E-07	0.202403499	1.88E-04	1331	550129	4163299.51
1332	550149	4163299.51	RES	7.40E-04	9.90E-04	2.56E-07	1.03E-06	1.01E-08	2.03E-07	2.1E-07	0.213207257	1.98E-04	1332	550149	4163299.51
1333	550169	4163299.51	RES	7.70E-04	1.04E-03	2.67E-07	1.09E-06	1.05E-08	2.13E-07	2.2E-07	0.223875023	2.08E-04	1333	550169	4163299.51
1334	550189	4163299.51	RES	8.20E-04	1.09E-03	2.84E-07	1.14E-06	1.12E-08	2.24E-07	2.3E-07	0.234814775	2.18E-04	1334	550189	4163299.51
1335	550209	4163299.51	RES	8.70E-04	1.16E-03	3.01E-07	1.21E-06	1.18E-08	2.38E-07	2.5E-07	0.249858441	2.32E-04	1335	550209	4163299.51
1336	550229	4163299.51	RES	9.30E-04	1.25E-03	3.22E-07	1.31E-06	1.26E-08	2.56E-07	2.7E-07	0.269142015	2.50E-04	1336	550229	4163299.51
1337	550249	4163299.51	RES	1.01E-03	1.35E-03	3.50E-07	1.41E-06	1.37E-08	2.77E-07	2.9E-07	0.290749532	2.70E-04	1337	550249	4163299.51
1338	550269	4163299.51	RES	1.09E-03	1.46E-03	3.77E-07	1.53E-06	1.48E-08	3.00E-07	3.1E-07	0.314409007	2.92E-04	1338	550269	4163299.51
1339	550289	4163299.51	RES	1.18E-03	1.58E-03	4.08E-07	1.65E-06	1.60E-08	3.24E-07	3.4E-07	0.340256432	3.16E-04	1339	550289	4163299.51
1340	550309	4163299.51	RES	1.28E-03	1.72E-03	4.43E-07	1.80E-06	1.74E-08	3.53E-07	3.7E-07	0.370343764	3.44E-04	1340	550309	4163299.51
1341	550689	4163299.51	WOR	2.42E-03	2.79E-03	3.81E-07	4.40E-07	3.78E-08	0.00E+00	3.8E-08	0.037776522	5.58E-04	1341	550689	4163299.51
1342	550969	4163299.51	RES	6.30E-04	7.70E-04	2.18E-07	8.05E-07	8.57E-09	1.58E-07	1.7E-07	0.166568274	1.54E-04	1342	550969	4163299.51
1343	550989	4163299.51	RES	5.90E-04	7.30E-04	2.04E-07	7.63E-07	8.02E-09	1.50E-07	1.6E-07	0.157816473	1.46E-04	1343	550989	4163299.51
1344	551009	4163299.51	RES	5.60E-04	6.90E-04	1.94E-07	7.21E-07	7.62E-09	1.42E-07	1.5E-07	0.149200664	1.38E-04	1344	551009	4163299.51
1345	551029	4163299.51	RES	5.30E-04	6.50E-04	1.83E-07	6.79E-07	7.21E-09	1.33E-07	1.4E-07	0.140584856	1.30E-04	1345	551029	4163299.51
1346	551049	4163299.51	RES	5.10E-04	6.30E-04	1.77E-07	6.58E-07	6.94E-09	1.29E-07	1.4E-07	0.136208955	1.26E-04	1346	551049	4163299.51
1347	551069	4163299.51	RES	4.80E-04	6.00E-04	1.66E-07	6.27E-07	6.53E-09	1.23E-07	1.3E-07	0.129645104	1.20E-04	1347	551069	4163299.51
1348	551089	4163299.51	RES	4.60E-04	5.70E-04	1.59E-07	5.96E-07	6.26E-09	1.17E-07	1.2E-07	0.123217246	1.14E-04	1348	551089	4163299.51
1349	551109	4163299.51	RES	4.40E-04	5.40E-04	1.52E-07	5.64E-07	5.98E-09	1.11E-07	1.2E-07	0.116789388	1.08E-04	1349	551109	4163299.51
1350	549909	4163319.51	RES	3.90E-04	5.30E-04	1.35E-07	5.54E-07	5.30E-09	1.09E-07	1.1E-07	0.114057465	1.06E-04	1350	549909	4163319.51
1351	549929	4163319.51	RES	4.20E-04	5.80E-04	1.45E-07	6.06E-07	5.71E-09	1.19E-07	1.2E-07	0.124725231	1.16E-04	1351	549929	4163319.51
1352	549949	4163319.51	RES	4.50E-04	6.10E-04	1.56E-07	6.38E-07	6.12E-09	1.25E-07	1.3E-07	0.131289082	1.22E-04	1352	549949	4163319.51
1353	549969	4163319.51	RES	4.70E-04	6.50E-04	1.63E-07	6.79E-07	6.39E-09	1.33E-07	1.4E-07	0.139768897	1.30E-04	1353	549969	4163319.51
1354	549989	4163319.51	RES	5.00E-04	6.80E-04	1.73E-07	7.11E-07	6.80E-09	1.40E-07	1.5E-07	0.146332748	1.36E-04	1354	549989	4163319.51
1355	550009	4163319.51	RES	5.30E-04	7.20E-04	1.83E-07	7.53E-07	7.21E-09	1.48E-07	1.5E-07	0.154948556	1.44E-04	1355	550009	4163319.51
1356	550029	4163319.51	RES	5.50E-04	7.50E-04	1.90E-07	7.84E-07	7.48E-09	1.54E-07	1.6E-07	0.161376414	1.50E-04	1356	550029	4163319.51
1357	550069	4163319.51	RES	5.80E-04	7.80E-04	2.01E-07	8.15E-07	7.89E-09	1.60E-07	1.7E-07	0.167940266	1.56E-04	1357	550069	4163319.51
1358	550089	4163319.51	RES	6.10E-04	8.20E-04	2.11E-07	8.57E-07	8.30E-09	1.68E-07	1.8E-07	0.176556074	1.64E-04	1358	550089	4163319.51
1359	550109	4163319.51	RES	6.40E-04	8.50E-04	2.22E-07	8.88E-07	8.70E-09	1.74E-07	1.8E-07	0.183119925	1.70E-04	1359	550109	4163319.51
1360	550129	4163319.51	RES	6.70E-04	9.00E-04	2.32E-07	9.41E-07	9.11E-09	1.85E-07	1.9E-07	0.19378769	1.80E-04	1360	550129	4163319.51
1361	550149	4163319.51	RES	7.00E-04	9.30E-04	2.42E-07	9.72E-07	9.52E-09	1.91E-07	2.0E-07	0.200351542	1.86E-04	1361	550149	4163319.51
1362	550189	4163319.51	RES	7.50E-04	1.00E-03	2.60E-07	1.05E-06	1.02E-08	2.05E-07	2.2E-07	0.215395208	2.00E-04	1362	550189	4163319.51
1363	550209	4163319.51	RES	8.00E-04	1.06E-03	2.77E-07	1.11E-06	1.09E-08	2.18E-07	2.3E-07	0.228386917	2.12E-04	1363	550209	4163319.51
1364	550229	4163319.51	RES	8.50E-04	1.13E-03	2.94E-07	1.18E-06	1.16E-08	2.32E-07	2.4E-07	0.243430583	2.26E-04	1364	550229	4163319.51
1365	550249	4163319.51	RES	9.10E-04	1.20E-03	3.15E-07	1.25E-06	1.24E-08	2.46E-07	2.6E-07	0.258610243	2.40E-04	1365	550249	4163319.51
1366	550269	4163319.51	RES	9.70E-04	1.28E-03	3.36E-07	1.34E-06	1.32E-08	2.63E-07	2.8E-07	0.275841859	2.56E-04	1366	550269	4163319.51
1367	550289	4163319.51	RES	1.04E-03	1.37E-03	3.60E-07	1.43E-06	1.41E-08	2.81E-07	3.0E-07	0.295261426	2.74E-04	1367	550289	4163319.51
1368	550309	4163319.51	RES	1.11E-03	1.47E-03	3.84E-07	1.54E-06	1.51E-08	3.02E-07	3.2E-07	0.31673295	2.94E-04	1368	550309	4163319.51
1369	550329	4163319.51	RES	1.19E-03	1.57E-03	4.12E-07	1.64E-06	1.62E-08	3.22E-07	3.4E-07	0.338340468	3.14E-04	1369	550329	4163319.51
1370	550969	4163319.51	RES	5.90E-04	7.00E-04	2.04E-07	7.32E-07	8.02E-09	1.44E-07	1.5E-07	0.151660601	1.40E-04	1370	550969	4163319.51
1371	550989	4163319.51	RES	5.50E-04	6.60E-04	1.90E-07	6.90E-07	7.48E-09	1.35E-07	1.4E-07	0.142908799	1.32E-04	1371	550989	4163319.51
1372	551029	4163319.51	RES	5.00E-04	6.00E-04	1.73E-07	6.27E-07	6.80E-09	1.23E-07	1.3E-07	0.12991709	1.20E-04	1372	551029	4163319.51
1373	551049	4163319.51	RES	4.80E-04	5.80E-04	1.66E-07	6.06E-07	6.53E-09	1.19E-07	1.3E-07	0.12554119	1.16E-04	1373	551049	4163319.51
1374	551069	4163319.51	RES	4.50E-04	5.50E-04	1.56E-07	5.75E-07	6.12E-09	1.13E-07	1.2E-07	0.118977339	1.10E-04	1374	551069	4163319.51
1375	551089	4163319.51	RES	4.30E-04	5.30E-04	1.49E-07	5.54E-07	5.85E-09	1.09E-07	1.1E-07	0.114601438	1.06E-04	1375	551089	4163319.51
1376	551109	4163319.51	RES	4.10E-04	5.00E-04	1.42E-07	5.23E-07	5.58E-09	1.03E-07	1.1E-07	0.10817358	1.00E-04	1376	551109	4163319.51
1377	549929	4163339.51	RES	4.10E-04	5.60E-04	1.42E-07	5.85E-07	5.58E-09	1.15E-07	1.2E-07	0.120485323	1.12E-04	1377	549929	4163339.51
1378	549949	4163339.51	RES	4.30E-04	5.90E-04	1.49E-07	6.17E-07	5.85E-09	1.21E-07	1.3E-07	0.126913181	1.18E-04	1378	549949	4163339.51
1379	549969	4163339.51	RES	4.50E-04	6.20E-04	1.56E-07	6.48E-07	6.12E-09	1.27E-07	1.3E-07	0.133341039	1.24E-04	1379	549969	4163339.51
1380	549989	4163339.51	RES	4.80E-04	6.50E-04	1.66E-07	6.79E-07	6.53E-09	1.33E-07	1.4E-07	0.13990489	1.30E-04	1380	549989	4163339.51
1381	550009	4163339.51	RES	5.00E-04	6.80E-04	1.73E-07	7.11E-07	6.80E-09	1.40E-07	1.5E-07	0.146332748	1.36E-04	1381	550009	4163339.51
1382	550029	4163339.51	RES	5.20E-04	7.10E-04	1.80E-07	7.42E-07	7.07E-09	1.46E-07	1.5E-07	0.152760606	1.42E-04	1382	550029	4163339.51
1383	550049	4163339.51	RES	5.40E-04	7.30E-04	1.87E-07	7.63E-07	7.34E-09	1.50E-07	1.6E-07	0.157136507	1.46E-04	1383	550049	4163339.51
1384	550069	4163339.51	RES	5.60E-04	7.50E-04	1.94E-07	7.84E-07	7.62E-09	1.54E-07	1.6E-07	0.161512408	1.50E-04	1384	550069	4163339.51
1385	550109	4163339.51	RES	6.10E-04	8.10E-04	2.11E-07	8.47E-07	8.30E-09	1.66E-07	1.7E-07	0.174504117	1.62E-04	1385	550109	4163339.51
1386	550129	4163339.51	RES	6.40E-04	8.40E-04	2.22E-07	8.78E-07	8.70E-09	1.72E-07	1.8E-07	0.181067968	1.68E-04	1386	550129	4163339.51
1387	550189	4163339.51	RES	7.00E-04	9.10E-04	2.42E-07	9.51E-07	9.52E-09	1.87E-07	2.0E-07	0.196247627	1.82E-04	1387	550189	4163339.51
1388	550209	4163339.51	RES	7.40E-04	9.60E-04	2.56E-07	1.00E-06	1.01E-08	1.97E-07	2.1E-07	0.207051386	1.92E-04	1388	550209	4163339.51
1389	550229	4163339.51	RES	7.80E-04	1.01E-03	2.70E-07	1.06E-06	1.06E-08	2.07E-07	2.2E-07	0.217855144	2.02E-04	1389	550229	4163339.51
1390	550249	4163339.51	RES	8.20E-04	1.07E-03	2.84E-07	1.12E-06	1.12E-08	2.20E-07	2.3E-07	0.23071086	2.14E-04	1390	550249	4163339.51
1391	550269	4163339.51	RES	8.70E-04	1.13E-03	3.01E-07	1.18E-06	1.18E-08	2.32E-07	2.4E-07	0.243702569	2.26E-04	1391	550269	4163339.51
1392	550289	4163339.51	RES	9.20E-04	1.20E-03	3.18E-07	1.25E-06	1.25E-08	2.46E-07	2.6E-07	0.258746236	2.40E-04	1392	550289	4163339.51
1393	550309	4163339.51	RES	9.80E-04	1.26E-03	3.39E-07	1.32E-06	1.33E-08	2.59E-07	2.7E-07	0.271873938	2.52E-04	1393	550309	4163339.51
1394	550329	4163339.51	RES	1.03E-03	1.33E-03	3.57E-07	1.39E-06	1.40E-08	2.73E-07	2.9E-07	0.286917604	2.66E-04	1394	550329	4163339.51
1395	550349	4163339.51	RES	1.09E-03	1.41E-03	3.77E-07	1.47E-06	1.48E-08	2.89E-07	3.0E-07	0.304149221	2.82E-04	1395	550349	4163339.51
1396	550409	4163339.51	RES	1.34E-03	1.70E-03	4.64E-07	1.78E-06	1.82E-08	3.49E-07	3.7E-07	0.367055809	3.40E-04	1396	550409	4163339.51
1397	550969	4163339.51	RES	5.40E-04	6.40E-04	1.87E-07	6.69E-07	7.34E-09	1.31E-07	1.4E-07	0.138668892	1.28E-04	1397	550969	4163339.51
1398	550989	4163339.51	RES	5.10E-04	6.00E-04	1.77E-07	6.27E-07	6.94E-09	1.23E-07	1.3E-07	0.130053084	1.20E-04	1398	550989	4163339.51
1399	551009	4163339.51	RES	4.90E-04	5.80E-04	1.70E-07	6.06E-07	6.66E-09	1.19E-07	1.3E-07	0.125677183	1.16E-04	1399	551009	4163339.51
1400	551029	4163339.51	RES	4.70E-04	5.60E-04	1.63E-07	5.85E-07	6.39E-09	1.15E-07	1.2E-07	0.121301282	1.12E-04	1400	551029	4163339.51
1401	551049	4163339.51	RES	4.50E-04	5.30E-04	1.56E-07	5.54E-07	6.12E-09	1.09E-07	1.1E-07	0.114873424	1.06E-04	1401	551049	4163339.51

1402	551069	4163339.51	RES	4.30E-04	5.10E-04	1.49E-07	5.33E-07	5.85E-09	1.05E-07	1.1E-07	0.110497523	1.02E-04	1402	551069	4163339.51
1403	551109	4163339.51	RES	3.90E-04	4.70E-04	1.35E-07	4.91E-07	5.30E-09	9.64E-08	1.0E-07	0.101745722	9.40E-05	1403	551109	4163339.51
1404	549929	4163359.51	RES	3.90E-04	5.40E-04	1.35E-07	5.64E-07	5.30E-09	1.11E-07	1.2E-07	0.116109422	1.08E-04	1404	549929	4163359.51
1405	549949	4163359.51	RES	4.10E-04	5.60E-04	1.42E-07	5.85E-07	5.58E-09	1.15E-07	1.2E-07	0.120485323	1.12E-04	1405	549949	4163359.51
1406	549969	4163359.51	RES	4.30E-04	5.90E-04	1.49E-07	6.17E-07	5.85E-09	1.21E-07	1.3E-07	0.126913181	1.18E-04	1406	549969	4163359.51
1407	549989	4163359.51	RES	4.50E-04	6.20E-04	1.56E-07	6.48E-07	6.12E-09	1.27E-07	1.3E-07	0.133341039	1.24E-04	1407	549989	4163359.51
1408	550009	4163359.51	RES	4.70E-04	6.40E-04	1.63E-07	6.69E-07	6.39E-09	1.31E-07	1.4E-07	0.13771694	1.28E-04	1408	550009	4163359.51
1409	550029	4163359.51	RES	4.90E-04	6.70E-04	1.70E-07	7.00E-07	6.66E-09	1.37E-07	1.4E-07	0.144144798	1.34E-04	1409	550029	4163359.51
1410	550169	4163359.51	RES	6.20E-04	8.00E-04	2.15E-07	8.36E-07	8.43E-09	1.64E-07	1.7E-07	0.172588153	1.60E-04	1410	550169	4163359.51
1411	550189	4163359.51	RES	6.50E-04	8.30E-04	2.25E-07	8.68E-07	8.84E-09	1.70E-07	1.8E-07	0.179152004	1.66E-04	1411	550189	4163359.51
1412	550209	4163359.51	RES	6.80E-04	8.70E-04	2.35E-07	9.09E-07	9.25E-09	1.79E-07	1.9E-07	0.187767812	1.74E-04	1412	550209	4163359.51
1413	550229	4163359.51	RES	7.10E-04	9.10E-04	2.46E-07	9.51E-07	9.66E-09	1.87E-07	2.0E-07	0.19638362	1.82E-04	1413	550229	4163359.51
1414	550249	4163359.51	RES	7.50E-04	9.50E-04	2.60E-07	9.93E-07	1.02E-08	1.95E-07	2.1E-07	0.205135422	1.90E-04	1414	550249	4163359.51
1415	550269	4163359.51	RES	7.80E-04	1.00E-03	2.70E-07	1.05E-06	1.06E-08	2.05E-07	2.2E-07	0.215803187	2.00E-04	1415	550269	4163359.51
1416	550289	4163359.51	RES	8.20E-04	1.05E-03	2.84E-07	1.10E-06	1.12E-08	2.15E-07	2.3E-07	0.226606946	2.10E-04	1416	550289	4163359.51
1417	550309	4163359.51	RES	8.70E-04	1.10E-03	3.01E-07	1.15E-06	1.18E-08	2.26E-07	2.4E-07	0.237546698	2.20E-04	1417	550309	4163359.51
1418	550329	4163359.51	RES	9.10E-04	1.15E-03	3.15E-07	1.20E-06	1.24E-08	2.36E-07	2.5E-07	0.248350456	2.30E-04	1418	550329	4163359.51
1419	550349	4163359.51	RES	9.60E-04	1.21E-03	3.32E-07	1.26E-06	1.31E-08	2.48E-07	2.6E-07	0.261342166	2.42E-04	1419	550349	4163359.51
1420	550369	4163359.51	RES	1.01E-03	1.27E-03	3.50E-07	1.33E-06	1.37E-08	2.61E-07	2.7E-07	0.274333875	2.54E-04	1420	550369	4163359.51
1421	550389	4163359.51	RES	1.09E-03	1.35E-03	3.77E-07	1.41E-06	1.48E-08	2.77E-07	2.9E-07	0.291837477	2.70E-04	1421	550389	4163359.51
1422	550409	4163359.51	RES	1.18E-03	1.46E-03	4.08E-07	1.53E-06	1.60E-08	3.00E-07	3.2E-07	0.315632945	2.92E-04	1422	550409	4163359.51
1423	550429	4163359.51	RES	1.30E-03	1.59E-03	4.50E-07	1.66E-06	1.77E-08	3.26E-07	3.4E-07	0.343940307	3.18E-04	1423	550429	4163359.51
1424	550449	4163359.51	RES	1.44E-03	1.75E-03	4.98E-07	1.83E-06	1.96E-08	3.59E-07	3.8E-07	0.378675526	3.50E-04	1424	550449	4163359.51
1425	550469	4163359.51	RES	1.60E-03	1.94E-03	5.54E-07	2.03E-06	2.18E-08	3.98E-07	4.2E-07	0.419838604	3.88E-04	1425	550469	4163359.51
1426	550489	4163359.51	RES	1.78E-03	2.13E-03	6.16E-07	2.23E-06	2.42E-08	4.37E-07	4.6E-07	0.461273668	4.26E-04	1426	550489	4163359.51
1427	550509	4163359.51	RES	1.97E-03	2.30E-03	6.82E-07	2.40E-06	2.68E-08	4.72E-07	5.0E-07	0.49874081	4.60E-04	1427	550509	4163359.51
1428	550529	4163359.51	RES	2.22E-03	2.49E-03	7.68E-07	2.60E-06	3.02E-08	5.11E-07	5.4E-07	0.541127826	4.98E-04	1428	550529	4163359.51
1429	550549	4163359.51	RES	2.61E-03	2.74E-03	9.03E-07	2.86E-06	3.55E-08	5.62E-07	6.0E-07	0.597730489	5.48E-04	1429	550549	4163359.51
1430	550569	4163359.51	RES	3.23E-03	3.15E-03	1.12E-06	3.29E-06	4.39E-08	6.46E-07	6.9E-07	0.69029231	6.46E-04	1430	550569	4163359.51
1431	550589	4163359.51	RES	2.65E-03	2.80E-03	9.17E-07	2.93E-06	3.60E-08	5.75E-07	6.1E-07	0.610586205	5.60E-04	1431	550589	4163359.51
1432	550609	4163359.51	RES	3.04E-03	3.00E-03	1.05E-06	3.14E-06	4.13E-08	6.16E-07	6.6E-07	0.656929082	6.08E-04	1432	550609	4163359.51
1433	550629	4163359.51	RES	2.91E-03	2.88E-03	1.01E-06	3.01E-06	3.96E-08	5.91E-07	6.3E-07	0.630537685	5.82E-04	1433	550629	4163359.51
1434	550969	4163359.51	RES	5.10E-04	5.80E-04	1.77E-07	6.06E-07	6.94E-09	1.19E-07	1.3E-07	0.125949169	1.16E-04	1434	550969	4163359.51
1435	550989	4163359.51	RES	4.80E-04	5.50E-04	1.66E-07	5.75E-07	6.53E-09	1.13E-07	1.2E-07	0.119385318	1.10E-04	1435	550989	4163359.51
1436	551009	4163359.51	RES	4.60E-04	5.30E-04	1.59E-07	5.54E-07	6.26E-09	1.09E-07	1.2E-07	0.115009417	1.06E-04	1436	551009	4163359.51
1437	551029	4163359.51	RES	4.40E-04	5.10E-04	1.52E-07	5.33E-07	5.98E-09	1.05E-07	1.1E-07	0.110633517	1.02E-04	1437	551029	4163359.51
1438	551049	4163359.51	RES	4.20E-04	4.90E-04	1.45E-07	5.12E-07	5.71E-09	1.01E-07	1.1E-07	0.106257616	9.80E-05	1438	551049	4163359.51
1439	551069	4163359.51	RES	4.00E-04	4.70E-04	1.38E-07	4.91E-07	5.44E-09	9.64E-08	1.0E-07	0.101881715	9.40E-05	1439	551069	4163359.51
1440	551089	4163359.51	RES	3.80E-04	4.50E-04	1.32E-07	4.70E-07	5.17E-09	9.23E-08	9.8E-08	0.097505814	9.00E-05	1440	551089	4163359.51
1441	551109	4163359.51	RES	3.70E-04	4.30E-04	1.28E-07	4.49E-07	5.03E-09	8.82E-08	9.3E-08	0.093265907	8.60E-05	1441	551109	4163359.51
1442	549969	4163379.51	RES	4.10E-04	5.60E-04	1.42E-07	5.85E-07	5.58E-09	1.15E-07	1.2E-07	0.120485323	1.12E-04	1442	549969	4163379.51
1443	549989	4163379.51	RES	4.30E-04	5.90E-04	1.49E-07	6.17E-07	5.85E-09	1.21E-07	1.3E-07	0.126913181	1.18E-04	1443	549989	4163379.51
1444	550009	4163379.51	RES	4.50E-04	6.10E-04	1.56E-07	6.38E-07	6.12E-09	1.25E-07	1.3E-07	0.131289082	1.22E-04	1444	550009	4163379.51
1445	550029	4163379.51	RES	4.70E-04	6.30E-04	1.63E-07	6.58E-07	6.39E-09	1.29E-07	1.4E-07	0.135664983	1.26E-04	1445	550029	4163379.51
1446	550169	4163379.51	RES	5.80E-04	7.30E-04	2.01E-07	7.63E-07	7.89E-09	1.50E-07	1.6E-07	0.157680479	1.46E-04	1446	550169	4163379.51
1447	550189	4163379.51	RES	6.00E-04	7.60E-04	2.08E-07	7.94E-07	8.16E-09	1.56E-07	1.6E-07	0.164108337	1.52E-04	1447	550189	4163379.51
1448	550209	4163379.51	RES	6.30E-04	7.90E-04	2.18E-07	8.26E-07	8.57E-09	1.62E-07	1.7E-07	0.170672188	1.58E-04	1448	550209	4163379.51
1449	550229	4163379.51	RES	6.50E-04	8.20E-04	2.25E-07	8.57E-07	8.84E-09	1.68E-07	1.8E-07	0.177100046	1.64E-04	1449	550229	4163379.51
1450	550249	4163379.51	RES	6.80E-04	8.50E-04	2.35E-07	8.88E-07	9.25E-09	1.74E-07	1.8E-07	0.183663898	1.70E-04	1450	550249	4163379.51
1451	550269	4163379.51	RES	7.10E-04	8.90E-04	2.46E-07	9.30E-07	9.66E-09	1.83E-07	1.9E-07	0.192279706	1.78E-04	1451	550269	4163379.51
1452	550289	4163379.51	RES	7.50E-04	9.30E-04	2.60E-07	9.72E-07	1.02E-08	1.91E-07	2.0E-07	0.201031507	1.86E-04	1452	550289	4163379.51
1453	550309	4163379.51	RES	7.80E-04	9.70E-04	2.70E-07	1.01E-06	1.06E-08	1.99E-07	2.1E-07	0.209647316	1.94E-04	1453	550309	4163379.51
1454	550329	4163379.51	RES	8.20E-04	1.01E-03	2.84E-07	1.06E-06	1.12E-08	2.07E-07	2.2E-07	0.218399117	2.02E-04	1454	550329	4163379.51
1455	550369	4163379.51	RES	9.10E-04	1.11E-03	3.15E-07	1.16E-06	1.24E-08	2.28E-07	2.4E-07	0.240142628	2.22E-04	1455	550369	4163379.51
1456	550389	4163379.51	RES	9.80E-04	1.18E-03	3.39E-07	1.23E-06	1.33E-08	2.42E-07	2.6E-07	0.25545828	2.36E-04	1456	550389	4163379.51
1457	550409	4163379.51	RES	1.07E-03	1.28E-03	3.70E-07	1.34E-06	1.46E-08	2.63E-07	2.8E-07	0.277201791	2.56E-04	1457	550409	4163379.51
1458	550429	4163379.51	RES	1.17E-03	1.39E-03	4.05E-07	1.45E-06	1.59E-08	2.85E-07	3.0E-07	0.301133252	2.78E-04	1458	550429	4163379.51
1459	550449	4163379.51	RES	1.30E-03	1.53E-03	4.50E-07	1.60E-06	1.77E-08	3.14E-07	3.3E-07	0.331628564	3.06E-04	1459	550449	4163379.51
1460	550469	4163379.51	RES	1.45E-03	1.69E-03	5.02E-07	1.77E-06	1.97E-08	3.47E-07	3.7E-07	0.366499776	3.38E-04	1460	550469	4163379.51
1461	550489	4163379.51	RES	1.61E-03	1.86E-03	5.57E-07	1.94E-06	2.19E-08	3.82E-07	4.0E-07	0.403558939	3.72E-04	1461	550489	4163379.51
1462	550509	4163379.51	RES	1.80E-03	2.02E-03	6.23E-07	2.11E-06	2.45E-08	4.14E-07	4.4E-07	0.438974125	4.04E-04	1462	550509	4163379.51
1463	550529	4163379.51	RES	2.06E-03	2.21E-03	7.13E-07	2.31E-06	2.80E-08	4.53E-07	4.8E-07	0.481497134	4.42E-04	1463	550529	4163379.51
1464	550549	4163379.51	RES	2.49E-03	2.49E-03	8.62E-07	2.60E-06	3.39E-08	5.11E-07	5.4E-07	0.544799641	4.98E-04	1464	550549	4163379.51
1465	550569	4163379.51	RES	3.16E-03	2.92E-03	1.09E-06	3.05E-06	4.30E-08	5.99E-07	6.4E-07	0.642145342	6.32E-04	1465	550569	4163379.51
1466	550589	4163379.51	RES	2.44E-03	2.50E-03	8.45E-07	2.61E-06	3.32E-08	5.13E-07	5.5E-07	0.546171633	5.00E-04	1466	550589	4163379.51
1467	550609	4163379.51	RES	2.86E-03	2.72E-03	9.90E-07	2.84E-06	3.89E-08	5.58E-07	6.0E-07	0.597026404	5.72E-04	1467	550609	4163379.51
1468	550629	4163379.51	RES	2.62E-03	2.56E-03	9.07E-07	2.68E-06	3.56E-08	5.25E-07	5.6E-07	0.560931253	5.24E-04	1468	550629	4163379.51
1469	550949	4163379.51	RES	5.10E-04	5.70E-04	1.77E-07	5.96E-07	6.94E-09	1.17E-07	1.2E-07	0.123897212	1.14E-04	1469	550949	4163379.51
1470	550969	4163379.51	RES	4.80E-04	5.40E-04	1.66E-07	5.64E-07	6.53E-09	1.11E-07	1.2E-07	0.117333361	1.08E-04	1470	550969	4163379.51
1471	550989	4163379.51	RES	4.60E-04	5.10E-04	1.59E-07	5.33E-07	6.26E-09	1.05E-07	1.1E-07	0.110905503	1.02E-04	1471	550989	4163379.51
1472	551009	4163379.51	RES	4.40E-04	5.00E-04	1.52E-07	5.23E-07	5.98E-09	1.03E-07	1.1E-07	0.108581559	1.00E-04	1472	551009	4163379.51
1473	551029	4163379.51	RES	4.20E-04	4.80E-04	1.45E-07	5.02E-07	5.71E-09	9.85E-08	1.0E-07	0.104205659	9.60E-05	1473	551029	4163379.51
1474	551049	4163379.51	RES	4.00E-04	4.60E-04	1.38E-07	4.81E-07	5.44E-09	9.44E-08	1.0E-07	0.099829758	9.20E-05	1474	551049	4163379.51
1475	551069	4163379.51	RES	3.80E-04	4.40E-04	1.32E-07	4.60E-07	5.17E-09	9.03E-08	9.5E-08	0.095453857	8.80E-05	1475	551069	4163379.51
1476	551089	4163379.51	RES	3.60E-04	4.20E-04	1.25E-07	4.39E-07	4.90E-09	8.62E-08	9.1E-08	0.091077956	8.40E-05	1476	551089	4163379.51
1477	551109	4163379.51	RES	3.50E-04	4.00E-04	1.21E-07	4.18E-07	4.76E-09	8.21E-08	8.7E-08	0.086838049	8.00E-05	1477	551109	4163379.51
1478	550169	4163399.51	RES	5.50E-04	6.70E-04	1.90E-07	7.00E-07	7.48E-09	1.37E-07	1.4E-07	0.144960757	1.34E-04	1478	550169	4163399.51
1479	550189	4163399.51	RES	5.70E-04	7.00E-04	1.97E-07	7.32E-07	7.75E-09	1.44E-07	1.5E-07	0.151388615	1.40E-04	1479	550189	4163399.51
1480	550209	4163399.51	RES	5.90E-04	7.20E-04	2.04E-07	7.53E-07	8.02E-09	1.48E-07	1.6E-07	0.155764515	1.44E-04	1480	550209	4163399.51
1481	550229	4163399.51	RES	6.10E-04	7.50E-04	2.11E-07	7.84E-07	8.30E-09	1.54E-07	1.6E-07	0.162192373	1.50E-04	1481	550229	4163399.51
1482	550249	4163399.51	RES	6.40E-04	7.70E-04	2.22E-07	8.05E-07	8.70E-09	1.58E-07	1.7E-07	0.166704267	1.54E-04	1482	550249	4163399.51
1483	550269	4163399.51	RES	6.60E-04	8.00E-04	2.28E-07	8.36E-07	8.98E-09	1.64E-07	1.7E-07	0.173132125	1.60E-04	1483	550269	4163399.51
1484	550289	4163399.51	RES	6.90E-04	8.30E-04	2.39E-07	8.68E-07	9.38E-09	1.70E-07	1.8E-07	0.179695976	1.66E-04	1484	550289	4163399.51
1485	550309	4163399.51	RES	7.20E-04	8.60E-04	2.49E-07	8.99E-07	9.79E-09	1.76E-07	1.9E-07	0.186259827	1.72E-04	1485	550309	4163399.51
1486	550329	4163399.51	RES	7.50E-04	9.00E-04	2.60E-07	9.41E-07	1.02E-08	1.85E-07	1.9E-07	0.194875636	1.80E-04	1486	550329	4163399.51
1487	550349	4163399.51	RES	7.80E-04	9.40E-04	2.70E-07	9.82E-07	1.06E-08	1.93E-07	2.0E-07	0.203491444	1.88E-04	1487	550349	4163399.51
1488	550389	4163399.51	RES	9.00E-04	1.06E-03	3.12E-07	1.11E-06	1.22E-08	2.18E-07	2.3E-07	0.229746848	2.12E-04	1488	550389	4163399.51
1489	550409	4163399.51	RES	9.80E-04	1.14E-03	3.39E-07	1.19E-06	1.33E-08	2.34E-07	2.5E-07	0.247250451	2.28E-04	1489	550409	4163399.51
1490	550429	4163399.51	RES	1.08E-03	1.24E-03	3.74E-07	1.30E-06	1.47E-08	2.54E-07	2.7E-07	0.269129955	2.48E-04	1490	550429	4163399.51
1491	550449	4163399.51	RES	1.20E-03	1.36E-03	4.15E-07	1.42E-06	1.63E-08	2.79E-07	3.0E-07	0.295385359	2.72E-04	1491	550449	4163399.51
1492	550469	4163399.51	RES	1.33E-03	1.50E-03	4.60E-07	1.57E-06	1.81E-08	3.08E-07	3.3E-07	0.325880671	3.00E-04	1492	550469	4163399.51
1493	550489	4163399.51	RES	1.49E-03	1.65E-03	5.16E-07	1.72E-06	2.03E-08	3.39E-07	3.6E-07	0.35883592	3.30E-04	1493	550489	4163399.51
1494	550509	4163399.51	RES	1.68E-03	1.81E-03	5.82E-07	1.89E-06	2.28E-08	3.71E-07	3.9E-07	0.394251105	3.62E-04	1494	550509	4163399.51
1495	550529	4163399.51	RES	1.95E-03	2.00E-03	6.75E-07	2.09E-06	2.65E-08	4.10E-07	4.4E-07	0.436910107	4.00E-04	1495	550529	4163399.51
1496	550549	4163399.51	RES	2.39E-03	2.29E-03	8.27E-07	2.39E-06	3.25E-08	4.70E-07	5.0E-07	0.502400565	4.78E-04	1496	550549	4163399.51
1497	550569	4163399.51	RES	3.14E-03	2.76E-03	1.09E-06	2.88E-06	4.27E-08	5.66E-07	6.1E-07	0.609042041	6.28E-04	1497	550569	4163399.51
1498	550589	4163399.51	RES	2.29E-03	2.27E-03	7.93E-07	2.37E-06	3.11E-08	4.66E-07	5.0E-07	0.496936719	4.58E-04	1498	550589	4163399.51
1499	550609	4163399.51	RES	2.75E-03	2.52E-03	9.52E-07	2.63E-06	3.74E-08	5.17E-07	5.5E-07	0.554491335	5.50E-04	1499	550609	4163399.51
1500	550629	4163399.51	RES	2.39E-03	2.29E-03	8.27E-07	2.39E-06	3.25E-08	4.70E-07	5.0E-07	0.502400565	4.78E-04	1500	550629	4163399.51
1501	550929	4163399.51	RES	5.30E-04	5.70E-04	1.83E-07	5.96E-07	7.21E-09	1.17E-07	1.2E-07	0.124169198	1.14E-04	1501	550929	4163399.51
1502	550949	4163399.51	RES	4.90E-04	5.30E-04	1.70E-07	5.54E-07	6.66E-09	1.09E-07	1.2E-07	0.115417397	1.06E-04	1502	550949	4163399.51
1503	550969	4163399.51	RES	4.60E-04	5.00E-04	1.59E-07	5.23E-07	6.26E-09	1.03E-07	1.1E-07	0.108853546	1.00E-04	1503	550969	4163399.51
1504	550989	4163399.51	RES	4.40E-04	4.80E-04	1.52E-07	5.02E-07	5.98E-09	9.85E-08	1.0E-07	0.104477645	9.60E-05	1504	550989	4163399.51
1505	551009	4163399.51	RES	4.20E-04	4.60E-04	1.45E-07	4.81E-07	5.71E-09	9.44E-08	1.0E-07	0.100101744	9.20E-05	1505	551009	4163399.51
1506	551049	4163399.51	RES	3.80E-04	4.30E-04	1.32E-07	4.49E-07	5.17E-09	8.82E-08	9.3E-08	0.0934019	8.60E-05	1506	551049	4163399.51
1507	551069	4163399.51	RES	3.60E-04	4.10E-04	1.25E-07	4.29E-07	4.90E-09	8.41E-08	8.9E-08	0.089025999	8.20E-05	1507	551069	4163399.51
1508	551089	4163399.51	RES	3.40E-04	3.90E-04	1.18E-07	4.08E-07	4.62E-09	8.00E-08	8.5E-08	0.084650099	7.80E-05	1508	551089	4163399.51
1509	551109	4163399.51	RES	3.30E-04	3.70E-04	1.14E-07	3.87E-07	4.49E-09	7.59E-08	8.0E-08	0.080410191	7.40E-05	1509	551109	4163399.51
1510	549909	4163419.51	RES	3.20E-04	4.30E-04	1.11E-07	4.49E-07	4.35E-09	8.82E-08	9.3E-08	0.092585941	8.60E-05	1510	549909	4163419.51
1511	550169	4163419.51	RES	5.30E-04	6.30E-04	1.83E-07	6.58E-07	7.21E-09	1.29E-07	1.4E-07	0.136480942	1.26E-04	1511	550169	4163419.51
1512	550209	4163419.51	RES	5.60E-04	6.60E-04	1.94E-07	6.90E-07	7.62E-09	1.35E-07	1.4E-07	0.143044793	1.32E-04	1512	550209	4163419.51
1513	550229	4163419.51	RES	5.80E-04	6.90E-04	2.01E-07	7.21E-07	7.89E-09	1.42E-07	1.5E-07	0.149472651	1.38E-04	1513	550229	4163419.51
1514	550249	4163419.51	RES	6.00E-04	7.10E-04	2.08E-07	7.42E-07	8.16E-09	1.46E-07	1.5E-07	0.153848551	1.42E-04	1514	550249	4163419.51
1515	550289	4163419.51	RES	6.50E-04	7.50E-04	2.25E-07	7.84E-07	8.84E-09	1.54E-07	1.6E-07	0.162736346	1.50E-04	1515	550289	4163419.51
1516	550349	4163419.51	RES	7.30E-04	8.50E-04	2.53E-07	8.88E-07	9.93E-09	1.74E-07	1.8E-07	0.184343863	1.70E-04	1516	550349	4163419.51
1517	550369	4163419.51	RES	7.80E-04	9.00E-04	2.70E-07	9.41E-07	1.06E-08	1.85E-07	2.0E-07	0.195283615	1.80E-04	1517	550369	4163419.51
1518	550389	4163419.51	RES	8.40E-04	9.60E-04	2.91E-07	1.00E-06	1.14E-08	1.97E-07	2.1E-07	0.208411317	1.92E-04	1518	550389	4163419.51
1519	550409	4163419.51	RES	9.20E-04	1.04E-03	3.18E-07	1.09E-06	1.25E-08	2.13E-07	2.3E-07	0.22591492	2.08E-04	1519	550409	4163419.51
1520	550429	4163419.51	RES	1.02E-03	1.13E-03	3.53E-07	1.18E-06	1.39E-08	2.32E-07	2.5E-07	0.245742467	2.26E-04	1520	550429	4163419.51
1521	550449	4163419.51	RES	1.13E-03	1.24E-03	3.91E-07	1.30E-06	1.54E-08	2.54E-07	2.7E-07	0.269809921	2.48E-04	1521	550449	4163419.51
1522	550469	4163419.51	RES	1.26E-03	1.36E-03	4.36E-07	1.42E-06	1.71E-08	2.79E-07	3.0E-07	0.296201318	2.72E-04	1522	550469	4163419.51
1523	550489	4163419.51	RES	1.41E-03	1.50E-03	4.88E-07	1.57E-06	1.92E-08	3.08E-07	3.3E-07	0.326968617	3.00E-04	1523	550489	4163419.51
1524	550529	4163419.51	RES	1.88E-03	1.85E-03	6.51E-07	1.93E-06	2.56E-08	3.80E-07	4.1E-07	0.405178797	3.76E-04	1524	550529	4163419.51
1525	550549	4163419.51	RES	2.32E-03	2.13E-03	8.03E-07	2.23E-06	3.16E-08	4.37E-07	4.7E-07	0.468617298	4.64E-04	1525	550549	4163419.51
1526	550569	4163419.51	RES	3.17E-03	2.65E-03	1.10E-06	2.77E-06	4.31E-08	5.44E-07	5.9E-07	0.586878491	6.34E-04	1526	550569	4163419.51
1527	550609	4163419.51	RES	3.04E-03	2.58E-03	1.05E-06	2.70E-06	4.13E-08	5.29E-07	5.7E-07	0.570746879	6.08E-04	1527	550609	4163419.51
1528	550629	4163419.51	RES	2.21E-03	2.08E-03	7.65E-07	2.17E-06	3.01E-08	4.27E-07	4.6E-07	0.456861587	4.42E-04	1528	550629	4163419.51
1529	550929	4163419.51	RES	5.00E-04	5.30E-04	1.73E-07	5.54E-07	6.80E-09	1.09E-07	1.2E-07	0.11555339	1.06E-04	1529	550929	4163419.51

1530	550949	4163419.51	RES	4.70E-04	5.00E-04	1.63E-07	5.23E-07	6.39E-09	1.03E-07	1.1E-07	0.108989539	1.00E-04	1530	550949	4163419.51
1531	550969	4163419.51	RES	4.50E-04	4.80E-04	1.56E-07	5.02E-07	6.12E-09	9.85E-08	1.0E-07	0.104613638	9.60E-05	1531	550969	4163419.51
1532	550989	4163419.51	RES	4.20E-04	4.60E-04	1.45E-07	4.81E-07	5.71E-09	9.44E-08	1.0E-07	0.100101744	9.20E-05	1532	550989	4163419.51
1533	551009	4163419.51	RES	4.00E-04	4.40E-04	1.38E-07	4.60E-07	5.44E-09	9.03E-08	9.6E-08	0.095725843	8.80E-05	1533	551009	4163419.51
1534	551029	4163419.51	RES	3.80E-04	4.20E-04	1.32E-07	4.39E-07	5.17E-09	8.62E-08	9.1E-08	0.091349943	8.40E-05	1534	551029	4163419.51
1535	551049	4163419.51	RES	3.60E-04	4.00E-04	1.25E-07	4.18E-07	4.90E-09	8.21E-08	8.7E-08	0.086974042	8.00E-05	1535	551049	4163419.51
1536	551069	4163419.51	RES	3.40E-04	3.80E-04	1.18E-07	3.97E-07	4.62E-09	7.80E-08	8.3E-08	0.082598141	7.60E-05	1536	551069	4163419.51
1537	551089	4163419.51	RES	3.30E-04	3.60E-04	1.14E-07	3.76E-07	4.49E-09	7.39E-08	7.8E-08	0.078358234	7.20E-05	1537	551089	4163419.51
1538	551109	4163419.51	RES	3.10E-04	3.50E-04	1.07E-07	3.66E-07	4.22E-09	7.18E-08	7.6E-08	0.07603429	7.00E-05	1538	551109	4163419.51
1539	549909	4163439.51	RES	3.00E-04	4.00E-04	1.04E-07	4.18E-07	4.08E-09	8.21E-08	8.6E-08	0.086158083	8.00E-05	1539	549909	4163439.51
1540	549929	4163439.51	RES	3.10E-04	4.20E-04	1.07E-07	4.39E-07	4.22E-09	8.62E-08	9.0E-08	0.090397991	8.40E-05	1540	549929	4163439.51
1541	549949	4163439.51	RES	3.20E-04	4.30E-04	1.11E-07	4.49E-07	4.35E-09	8.82E-08	9.3E-08	0.092585941	8.60E-05	1541	549949	4163439.51
1542	549969	4163439.51	RES	3.40E-04	4.50E-04	1.18E-07	4.70E-07	4.62E-09	9.23E-08	9.7E-08	0.096961842	9.00E-05	1542	549969	4163439.51
1543	550169	4163439.51	RES	5.20E-04	5.90E-04	1.80E-07	6.17E-07	7.07E-09	1.21E-07	1.3E-07	0.12813712	1.18E-04	1543	550169	4163439.51
1544	550189	4163439.51	RES	5.30E-04	6.10E-04	1.83E-07	6.38E-07	7.21E-09	1.25E-07	1.3E-07	0.132377027	1.22E-04	1544	550189	4163439.51
1545	550209	4163439.51	RES	5.50E-04	6.20E-04	1.90E-07	6.48E-07	7.48E-09	1.27E-07	1.3E-07	0.134700971	1.24E-04	1545	550209	4163439.51
1546	550229	4163439.51	RES	5.70E-04	6.40E-04	1.97E-07	6.69E-07	7.75E-09	1.31E-07	1.4E-07	0.139076871	1.28E-04	1546	550229	4163439.51
1547	550249	4163439.51	RES	5.90E-04	6.60E-04	2.04E-07	6.90E-07	8.02E-09	1.35E-07	1.4E-07	0.143452772	1.32E-04	1547	550249	4163439.51
1548	550269	4163439.51	RES	6.10E-04	6.80E-04	2.11E-07	7.11E-07	8.30E-09	1.40E-07	1.5E-07	0.147828673	1.36E-04	1548	550269	4163439.51
1549	550289	4163439.51	RES	6.30E-04	7.00E-04	2.18E-07	7.32E-07	8.57E-09	1.44E-07	1.5E-07	0.152204574	1.40E-04	1549	550289	4163439.51
1550	550369	4163439.51	RES	7.40E-04	8.30E-04	2.56E-07	8.68E-07	1.01E-08	1.70E-07	1.8E-07	0.180375942	1.66E-04	1550	550369	4163439.51
1551	550389	4163439.51	RES	8.00E-04	8.80E-04	2.77E-07	9.20E-07	1.09E-08	1.81E-07	1.9E-07	0.191451687	1.76E-04	1551	550389	4163439.51
1552	550409	4163439.51	RES	8.80E-04	9.60E-04	3.05E-07	1.00E-06	1.20E-08	1.97E-07	2.1E-07	0.20895529	1.92E-04	1552	550409	4163439.51
1553	550429	4163439.51	RES	9.70E-04	1.04E-03	3.36E-07	1.09E-06	1.32E-08	2.13E-07	2.3E-07	0.226594886	2.08E-04	1553	550429	4163439.51
1554	550449	4163439.51	RES	1.09E-03	1.14E-03	3.77E-07	1.19E-06	1.48E-08	2.34E-07	2.5E-07	0.248746376	2.28E-04	1554	550449	4163439.51
1555	550469	4163439.51	RES	1.23E-03	1.26E-03	4.26E-07	1.32E-06	1.67E-08	2.59E-07	2.8E-07	0.275273767	2.52E-04	1555	550469	4163439.51
1556	550489	4163439.51	RES	1.39E-03	1.39E-03	4.81E-07	1.45E-06	1.89E-08	2.85E-07	3.0E-07	0.304125101	2.78E-04	1556	550489	4163439.51
1557	550509	4163439.51	RES	1.59E-03	1.55E-03	5.50E-07	1.62E-06	2.16E-08	3.18E-07	3.4E-07	0.339676279	3.18E-04	1557	550509	4163439.51
1558	550529	4163439.51	RES	1.86E-03	1.74E-03	6.44E-07	1.82E-06	2.53E-08	3.57E-07	3.8E-07	0.382335281	3.72E-04	1558	550529	4163439.51
1559	550549	4163439.51	RES	2.31E-03	2.03E-03	8.00E-07	2.12E-06	3.14E-08	4.17E-07	4.5E-07	0.447961733	4.62E-04	1559	550549	4163439.51
1560	550569	4163439.51	RES	3.29E-03	2.62E-03	1.14E-06	2.74E-06	4.47E-08	5.38E-07	5.8E-07	0.582354537	6.58E-04	1560	550569	4163439.51
1561	550609	4163439.51	RES	2.81E-03	2.35E-03	9.73E-07	2.46E-06	3.82E-08	4.82E-07	5.2E-07	0.520424021	5.62E-04	1561	550609	4163439.51
1562	550909	4163439.51	RES	5.40E-04	5.50E-04	1.87E-07	5.75E-07	7.34E-09	1.13E-07	1.2E-07	0.120201277	1.10E-04	1562	550909	4163439.51
1563	550929	4163439.51	RES	5.00E-04	5.10E-04	1.73E-07	5.33E-07	6.80E-09	1.05E-07	1.1E-07	0.111449476	1.02E-04	1563	550929	4163439.51
1564	550949	4163439.51	RES	4.60E-04	4.80E-04	1.59E-07	5.02E-07	6.26E-09	9.85E-08	1.0E-07	0.104749631	9.60E-05	1564	550949	4163439.51
1565	550969	4163439.51	RES	4.40E-04	4.50E-04	1.52E-07	4.70E-07	5.98E-09	9.23E-08	9.8E-08	0.098321773	9.00E-05	1565	550969	4163439.51
1566	550989	4163439.51	RES	4.10E-04	4.30E-04	1.42E-07	4.49E-07	5.58E-09	8.82E-08	9.4E-08	0.093809879	8.60E-05	1566	550989	4163439.51
1567	551029	4163439.51	RES	3.70E-04	3.90E-04	1.28E-07	4.08E-07	5.03E-09	8.00E-08	8.5E-08	0.085058078	7.80E-05	1567	551029	4163439.51
1568	551049	4163439.51	RES	3.50E-04	3.70E-04	1.21E-07	3.87E-07	4.76E-09	7.59E-08	8.1E-08	0.080682177	7.40E-05	1568	551049	4163439.51
1569	551069	4163439.51	RES	3.30E-04	3.60E-04	1.14E-07	3.76E-07	4.49E-09	7.39E-08	7.8E-08	0.078358234	7.20E-05	1569	551069	4163439.51
1570	551089	4163439.51	RES	3.10E-04	3.40E-04	1.07E-07	3.55E-07	4.22E-09	6.98E-08	7.4E-08	0.073982333	6.80E-05	1570	551089	4163439.51
1571	551109	4163439.51	RES	2.90E-04	3.30E-04	1.00E-07	3.45E-07	3.94E-09	6.77E-08	7.2E-08	0.071658389	6.60E-05	1571	551109	4163439.51
1572	549909	4163459.51	RES	2.90E-04	3.80E-04	1.00E-07	3.97E-07	3.94E-09	7.80E-08	8.2E-08	0.081918176	7.60E-05	1572	549909	4163459.51
1573	549949	4163459.51	RES	3.10E-04	4.10E-04	1.07E-07	4.29E-07	4.22E-09	8.41E-08	8.8E-08	0.088346033	8.20E-05	1573	549949	4163459.51
1574	549969	4163459.51	RES	3.20E-04	4.20E-04	1.11E-07	4.39E-07	4.35E-09	8.62E-08	9.1E-08	0.090533984	8.40E-05	1574	549969	4163459.51
1575	549989	4163459.51	RES	3.30E-04	4.30E-04	1.14E-07	4.49E-07	4.49E-09	8.82E-08	9.3E-08	0.092721934	8.60E-05	1575	549989	4163459.51
1576	550009	4163459.51	RES	3.40E-04	4.40E-04	1.18E-07	4.60E-07	4.62E-09	9.03E-08	9.5E-08	0.094909885	8.80E-05	1576	550009	4163459.51
1577	550169	4163459.51	RES	5.20E-04	5.70E-04	1.80E-07	5.96E-07	7.07E-09	1.17E-07	1.2E-07	0.124033205	1.14E-04	1577	550169	4163459.51
1578	550189	4163459.51	RES	5.30E-04	5.80E-04	1.83E-07	6.06E-07	7.21E-09	1.19E-07	1.3E-07	0.126221155	1.16E-04	1578	550189	4163459.51
1579	550209	4163459.51	RES	5.50E-04	5.90E-04	1.90E-07	6.17E-07	7.48E-09	1.21E-07	1.3E-07	0.128545099	1.18E-04	1579	550209	4163459.51
1580	550229	4163459.51	RES	5.70E-04	6.10E-04	1.97E-07	6.38E-07	7.75E-09	1.25E-07	1.3E-07	0.132921	1.22E-04	1580	550229	4163459.51
1581	550249	4163459.51	RES	5.90E-04	6.30E-04	2.04E-07	6.58E-07	8.02E-09	1.29E-07	1.4E-07	0.1372969	1.26E-04	1581	550249	4163459.51
1582	550269	4163459.51	RES	6.10E-04	6.40E-04	2.11E-07	6.69E-07	8.30E-09	1.31E-07	1.4E-07	0.139620844	1.28E-04	1582	550269	4163459.51
1583	550289	4163459.51	RES	6.30E-04	6.60E-04	2.18E-07	6.90E-07	8.57E-09	1.35E-07	1.4E-07	0.143996745	1.32E-04	1583	550289	4163459.51
1584	550309	4163459.51	RES	6.40E-04	6.80E-04	2.22E-07	7.11E-07	8.70E-09	1.40E-07	1.5E-07	0.148236652	1.36E-04	1584	550309	4163459.51
1585	550329	4163459.51	RES	6.70E-04	7.00E-04	2.32E-07	7.32E-07	9.11E-09	1.44E-07	1.5E-07	0.152748546	1.40E-04	1585	550329	4163459.51
1586	550389	4163459.51	RES	7.70E-04	8.30E-04	2.67E-07	8.68E-07	1.05E-08	1.70E-07	1.8E-07	0.180783921	1.66E-04	1586	550389	4163459.51
1587	550409	4163459.51	RES	8.50E-04	8.90E-04	2.94E-07	9.30E-07	1.16E-08	1.83E-07	1.9E-07	0.19418361	1.78E-04	1587	550409	4163459.51
1588	550429	4163459.51	RES	9.40E-04	9.80E-04	3.25E-07	1.02E-06	1.28E-08	2.01E-07	2.1E-07	0.213875163	1.96E-04	1588	550429	4163459.51
1589	550449	4163459.51	RES	1.07E-03	1.08E-03	3.70E-07	1.13E-06	1.46E-08	2.22E-07	2.4E-07	0.236162646	2.16E-04	1589	550449	4163459.51
1590	550469	4163459.51	RES	1.23E-03	1.20E-03	4.26E-07	1.25E-06	1.67E-08	2.46E-07	2.6E-07	0.262962023	2.46E-04	1590	550469	4163459.51
1591	550509	4163459.51	RES	1.62E-03	1.49E-03	5.61E-07	1.56E-06	2.20E-08	3.06E-07	3.3E-07	0.327772515	3.24E-04	1591	550509	4163459.51
1592	550529	4163459.51	RES	1.91E-03	1.69E-03	6.61E-07	1.77E-06	2.60E-08	3.47E-07	3.7E-07	0.372755461	3.82E-04	1592	550529	4163459.51
1593	550549	4163459.51	RES	2.42E-03	2.01E-03	8.38E-07	2.10E-06	3.29E-08	4.12E-07	4.5E-07	0.445353743	4.84E-04	1593	550549	4163459.51
1594	550569	4163459.51	RES	2.68E-03	2.18E-03	9.28E-07	2.28E-06	3.64E-08	4.47E-07	4.8E-07	0.483772837	5.36E-04	1594	550569	4163459.51
1595	550589	4163459.51	RES	1.91E-03	1.75E-03	6.61E-07	1.83E-06	2.60E-08	3.59E-07	3.9E-07	0.385067204	3.82E-04	1595	550589	4163459.51
1596	550609	4163459.51	RES	2.64E-03	2.17E-03	9.14E-07	2.27E-06	3.59E-08	4.45E-07	4.8E-07	0.481176907	5.28E-04	1596	550609	4163459.51
1597	550909	4163459.51	RES	5.40E-04	5.30E-04	1.87E-07	5.54E-07	7.34E-09	1.09E-07	1.2E-07	0.116097363	1.08E-04	1597	550909	4163459.51
1598	550949	4163459.51	RES	4.60E-04	4.60E-04	1.59E-07	4.81E-07	6.26E-09	9.44E-08	1.0E-07	0.100645717	9.20E-05	1598	550949	4163459.51
1599	550969	4163459.51	RES	4.30E-04	4.40E-04	1.49E-07	4.60E-07	5.85E-09	9.03E-08	9.6E-08	0.096133823	8.80E-05	1599	550969	4163459.51
1600	550989	4163459.51	RES	4.00E-04	4.10E-04	1.38E-07	4.29E-07	5.44E-09	8.41E-08	9.0E-08	0.089569972	8.20E-05	1600	550989	4163459.51
1601	551009	4163459.51	RES	3.70E-04	3.90E-04	1.28E-07	4.08E-07	5.03E-09	8.00E-08	8.5E-08	0.085058078	7.80E-05	1601	551009	4163459.51
1602	551029	4163459.51	RES	3.50E-04	3.70E-04	1.21E-07	3.87E-07	4.76E-09	7.59E-08	8.1E-08	0.080682177	7.40E-05	1602	551029	4163459.51
1603	551049	4163459.51	RES	3.30E-04	3.50E-04	1.14E-07	3.66E-07	4.49E-09	7.18E-08	7.6E-08	0.076306277	7.00E-05	1603	551049	4163459.51
1604	551069	4163459.51	RES	3.10E-04	3.30E-04	1.07E-07	3.45E-07	4.22E-09	6.77E-08	7.2E-08	0.071930376	6.60E-05	1604	551069	4163459.51
1605	551089	4163459.51	RES	2.90E-04	3.20E-04	1.00E-07	3.34E-07	3.94E-09	6.57E-08	7.0E-08	0.069606432	6.40E-05	1605	551089	4163459.51
1606	551109	4163459.51	RES	2.80E-04	3.00E-04	9.69E-08	3.14E-07	3.81E-09	6.16E-08	6.5E-08	0.065366525	6.00E-05	1606	551109	4163459.51
1607	549909	4163479.51	RES	2.70E-04	3.60E-04	9.35E-08	3.76E-07	3.67E-09	7.39E-08	7.8E-08	0.077542275	7.20E-05	1607	549909	4163479.51
1608	549929	4163479.51	RES	2.80E-04	3.70E-04	9.69E-08	3.87E-07	3.81E-09	7.59E-08	8.0E-08	0.079730225	7.40E-05	1608	549929	4163479.51
1609	549949	4163479.51	RES	2.90E-04	3.80E-04	1.00E-07	3.97E-07	3.94E-09	7.80E-08	8.2E-08	0.081918176	7.60E-05	1609	549949	4163479.51
1610	549969	4163479.51	RES	3.00E-04	3.90E-04	1.04E-07	4.08E-07	4.08E-09	8.00E-08	8.4E-08	0.084106126	7.80E-05	1610	549969	4163479.51
1611	549989	4163479.51	RES	3.10E-04	4.00E-04	1.07E-07	4.18E-07	4.22E-09	8.21E-08	8.6E-08	0.086294076	8.00E-05	1611	549989	4163479.51
1612	550009	4163479.51	RES	3.20E-04	4.10E-04	1.11E-07	4.29E-07	4.35E-09	8.41E-08	8.8E-08	0.088482027	8.20E-05	1612	550009	4163479.51
1613	550029	4163479.51	RES	3.30E-04	4.20E-04	1.14E-07	4.39E-07	4.49E-09	8.62E-08	9.1E-08	0.090669977	8.40E-05	1613	550029	4163479.51
1614	550049	4163479.51	RES	3.40E-04	4.30E-04	1.18E-07	4.49E-07	4.62E-09	8.82E-08	9.3E-08	0.092857927	8.60E-05	1614	550049	4163479.51
1615	550169	4163479.51	RES	5.50E-04	5.60E-04	1.90E-07	5.85E-07	7.48E-09	1.15E-07	1.2E-07	0.122389227	1.12E-04	1615	550169	4163479.51
1616	550189	4163479.51	RES	5.60E-04	5.70E-04	1.94E-07	5.96E-07	7.62E-09	1.17E-07	1.2E-07	0.124577178	1.14E-04	1616	550189	4163479.51
1617	550209	4163479.51	RES	5.80E-04	5.80E-04	2.01E-07	6.06E-07	7.89E-09	1.19E-07	1.3E-07	0.126901121	1.16E-04	1617	550209	4163479.51
1618	550229	4163479.51	RES	6.00E-04	6.00E-04	2.08E-07	6.27E-07	8.16E-09	1.23E-07	1.3E-07	0.131277022	1.20E-04	1618	550229	4163479.51
1619	550249	4163479.51	RES	6.20E-04	6.20E-04	2.15E-07	6.48E-07	8.43E-09	1.27E-07	1.4E-07	0.135652923	1.24E-04	1619	550249	4163479.51
1620	550269	4163479.51	RES	6.40E-04	6.30E-04	2.22E-07	6.58E-07	8.70E-09	1.29E-07	1.4E-07	0.137976866	1.28E-04	1620	550269	4163479.51
1621	550289	4163479.51	RES	6.70E-04	6.50E-04	2.32E-07	6.79E-07	9.11E-09	1.33E-07	1.4E-07	0.14248876	1.34E-04	1621	550289	4163479.51
1622	550309	4163479.51	RES	6.80E-04	6.70E-04	2.35E-07	7.00E-07	9.25E-09	1.37E-07	1.5E-07	0.146728668	1.36E-04	1622	550309	4163479.51
1623	550329	4163479.51	RES	7.00E-04	6.90E-04	2.42E-07	7.21E-07	9.52E-09	1.42E-07	1.5E-07	0.151104568	1.40E-04	1623	550329	4163479.51
1624	550349	4163479.51	RES	7.40E-04	7.20E-04	2.56E-07	7.53E-07	1.01E-08	1.48E-07	1.6E-07	0.157804413	1.48E-04	1624	550349	4163479.51
1625	550409	4163479.51	RES	8.40E-04	8.40E-04	2.91E-07	8.78E-07	1.14E-08	1.72E-07	1.8E-07	0.183787831	1.68E-04	1625	550409	4163479.51
1626	550429	4163479.51	RES	9.30E-04	9.20E-04	3.22E-07	9.62E-07	1.26E-08	1.89E-07	2.0E-07	0.201427427	1.86E-04	1626	550429	4163479.51
1627	550449	4163479.51	RES	1.07E-03	1.03E-03	3.70E-07	1.08E-06	1.46E-08	2.11E-07	2.3E-07	0.22590286	2.14E-04	1627	550449	4163479.51
1628	550469	4163479.51	RES	1.27E-03	1.17E-03	4.40E-07	1.22E-06	1.73E-08	2.40E-07	2.6E-07	0.257350124	2.54E-04	1628	550469	4163479.51
1629	550489	4163479.51	RES	1.49E-03	1.32E-03	5.16E-07	1.38E-06	2.03E-08	2.71E-07	2.9E-07	0.291121332	2.98E-04	1629	550489	4163479.51
1630	550509	4163479.51	RES	1.72E-03	1.49E-03	5.95E-07	1.56E-06	2.34E-08	3.06E-07	3.3E-07	0.329132447	3.44E-04	1630	550509	4163479.51
1631	550529	4163479.51	RES	2.16E-03	1.77E-03	7.48E-07	1.85E-06	2.94E-08	3.63E-07	3.9E-07	0.392570948	4.32E-04	1631	550529	4163479.51
1632	550549	4163479.51	RES	2.82E-03	2.17E-03	9.76E-07	2.27E-06	3.84E-08	4.45E-07	4.8E-07	0.483624784	5.64E-04	1632	550549	4163479.51
1633	550569	4163479.51	RES	1.85E-03	1.63E-03	6.40E-07	1.70E-06	2.52E-08	3.34E-07	3.6E-07	0.359627759	3.70E-04	1633	550569	4163479.51
1634	550589	4163479.51	RES	2.55E-03	2.05E-03	8.83E-07	2.14E-06	3.47E-08	4.21E-07	4.6E-07	0.455329483	5.10E-04	1634	550589	4163479.51
1635	550609	4163479.51	RES	2.43E-03	1.98E-03	8.41E-07	2.07E-06	3.30E-08	4.06E-07	4.4E-07	0.439333864	4.86E-04	1635	550609	4163479.51
1636	550729	4163479.51	WOR	1.06E-03	1.04E-03	1.67E-07	1.64E-07	1.65E-08	0.00E+00	1.7E-08	0.016546741	2.12E-04	1636	550729	4163479.51
1637	550889	4163479.51	RES	6.00E-04	5.70E-04	2.08E-07	5.96E-07	8.16E-09	1.17E-07	1.3E-07	0.12512115	1.20E-04	1637	550889	4163479.51
1638	550909	4163479.51	RES	5.40E-04	5.20E-04	1.87E-07	5.44E-07	7.34E-09	1.07E-07	1.1E-07	0.114045405	1.08E-04	1638	550909	4163479.51
1639	550929	4163479.51	RES	4.90E-04	4.80E-04	1.70E-07	5.02E-07	6.66E-09	9.85E-08	1.1E-07	0.105157611	9.80E-05	1639	550929	4163479.51
1640	550949	4163479.51	RES	4.50E-04	4.50E-04	1.56E-07	4.70E-07	6.12E-09	9.23E-08	9.8E-08	0.098457766	9.00E-05	1640	550949	4163479.51
1641	550969	4163479.51	RES	4.20E-04	4.20E-04	1.45E-07	4.39E-07	5.71E-09	8.62E-08	9.2E-08	0.091893915	8.40E-05	1641	550969	4163479.51
1642	550989	4163479.51	RES	3.90E-04	3.90E-04	1.35E-07	4.08E-07	5.30E-09	8.00E-08	8.5E-08	0.085330064	7.80E-05	1642	550989	4163479.51
1643	551009	4163479.51	RES	3.60E-04	3.70E-04	1.25E-07	3.87E-07	4.90E-09	7.59E-08	8.1E-08	0.08081817	7.40E-05	1643	551009	4163479.51
1644	551029	4163479.51	RES	3.30E-04	3.50E-04	1.14E-07	3.66E-07	4.49E-09	7.18E-08	7.6E-08	0.076306277	7.00E-05	1644	551029	4163479.51
1645	551049	4163479.51	RES	3.10E-04	3.30E-04	1.07E-07	3.45E-07	4.22E-09	6.77E-08	7.2E-08	0.071930376	6.60E-05	1645	551049	4163479.51
1646	551069	4163479.51	RES	2.90E-04	3.10E-04	1.00E-07	3.24E-07	3.94E-09	6.36E-08	6.8E-08	0.067554475	6.20E-05	1646	551069	4163479.51
1647	551089	4163479.51	RES	2.70E-04	3.00E-04	9.35E-08	3.14E-07	3.67E-09	6.16E-08	6.5E-08	0.065230532	6.00E-05	1647	551089	4163479.51
1648	551109	4163479.51	RES	2.60E-04	2.80E-04	9.00E-08	2.93E-07	3.54E-09	5.75E-08	6.1E-08	0.060990624	5.60E-05	1648	551109	4163479.51
1649	549909	4163499.51	RES	2.60E-04	3.40E-04	9.00E-08	3.55E-07	3.54E-09	6.98E-08	7.3E-08	0.073302367	6.80E-05	1649	549909	4163499.51
1650	549929	4163499.51	RES	2.70E-04	3.50E-04	9.35E-08	3.66E-07	3.67E-09	7.18E-08	7.5E-08	0.075490318	7.00E-05	1650	549929	4163499.51
1651	549949	4163499.51	RES	2.70E-04	3.60E-04	9.35E-08	3.76E-07	3.67E-09	7.39E-08	7.8E-08	0.077542275	7.20E-05	1651	549949	4163499.51
1652	549969	4163499.51	RES	2.80E-04	3.70E-04	9.69E-08	3.87E-07	3.81E-09	7.59E-08	8.0E-08	0.079730225	7.40E-05	1652	549969	4163499.51
1653	549989	4163499.51	RES	2.90E-04	3.80E-04	1.00E-07	3.97E-07	3.94E-09	7.80E-08	8.2E-08	0.081918176	7.60E-05	1653	549989	4163499.51
1654	550009	4163499.51	RES	3.00E-04	3.80E-04	1.04E-07	3.97E-07	4.08E-09	7.80E-08	8.2E-08	0.082054169	7.60E-05	1654	550009	4163499.51
1655	550029	4163499.51	RES	3.10E-04	3.90E-04	1.07E-07	4.08E-07	4.22E-09	8.00E-08	8.4E-08	0.084242119	7.80E-05	1655	550029	4163499.51
1656	550049	4163499.51	RES	3.20E-04	4.00E-04	1.11E-07	4.18E-07	4.35E-09	8.21E-08	8.6E-08	0.086430069	8.00E-05	1656	550049	4163499.51
1657	550069	4163499.51	RES	3.40E-04	4.10E-04	1.18E-07	4.29E-07	4.62E-09	8.41E-08	8.9E-08	0.088754013	8.20E-05	1657	550069	4163499.51

1658	550089	4163499.51	RES	3.70E-04	4.30E-04	1.28E-07	4.49E-07	5.03E-09	8.82E-08	9.3E-08	0.093265907	8.60E-05	1658	550089	4163499.51
1659	550149	4163499.51	RES	5.60E-04	5.40E-04	1.94E-07	5.64E-07	7.62E-09	1.11E-07	1.2E-07	0.118421306	1.12E-04	1659	550149	4163499.51
1660	550169	4163499.51	RES	6.20E-04	5.80E-04	2.15E-07	6.06E-07	8.43E-09	1.19E-07	1.3E-07	0.127445094	1.24E-04	1660	550169	4163499.51
1661	550189	4163499.51	RES	6.30E-04	5.90E-04	2.18E-07	6.17E-07	8.57E-09	1.21E-07	1.3E-07	0.129633044	1.26E-04	1661	550189	4163499.51
1662	550209	4163499.51	RES	6.50E-04	6.00E-04	2.25E-07	6.27E-07	8.84E-09	1.23E-07	1.3E-07	0.131956988	1.30E-04	1662	550209	4163499.51
1663	550229	4163499.51	RES	6.80E-04	6.20E-04	2.35E-07	6.48E-07	9.25E-09	1.27E-07	1.4E-07	0.136468882	1.36E-04	1663	550229	4163499.51
1664	550249	4163499.51	RES	7.10E-04	6.40E-04	2.46E-07	6.69E-07	9.66E-09	1.31E-07	1.4E-07	0.140980775	1.42E-04	1664	550249	4163499.51
1665	550269	4163499.51	RES	7.40E-04	6.70E-04	2.56E-07	7.00E-07	1.01E-08	1.37E-07	1.5E-07	0.147544627	1.48E-04	1665	550269	4163499.51
1666	550289	4163499.51	RES	7.70E-04	6.90E-04	2.67E-07	7.21E-07	1.05E-08	1.42E-07	1.5E-07	0.15205652	1.54E-04	1666	550289	4163499.51
1667	550309	4163499.51	RES	7.60E-04	6.90E-04	2.63E-07	7.21E-07	1.03E-08	1.42E-07	1.5E-07	0.151920527	1.52E-04	1667	550309	4163499.51
1668	550329	4163499.51	RES	7.80E-04	7.10E-04	2.70E-07	7.42E-07	1.06E-08	1.46E-07	1.6E-07	0.156296428	1.56E-04	1668	550329	4163499.51
1669	550349	4163499.51	RES	8.10E-04	7.30E-04	2.80E-07	7.63E-07	1.10E-08	1.50E-07	1.6E-07	0.160808322	1.62E-04	1669	550349	4163499.51
1670	550369	4163499.51	RES	8.40E-04	7.60E-04	2.91E-07	7.94E-07	1.14E-08	1.56E-07	1.7E-07	0.167372173	1.68E-04	1670	550369	4163499.51
1671	550429	4163499.51	RES	9.40E-04	8.90E-04	3.25E-07	9.30E-07	1.28E-08	1.83E-07	2.0E-07	0.195407548	1.88E-04	1671	550429	4163499.51
1672	550449	4163499.51	RES	1.09E-03	1.00E-03	3.77E-07	1.05E-06	1.48E-08	2.05E-07	2.2E-07	0.220018975	2.18E-04	1672	550449	4163499.51
1673	550469	4163499.51	RES	1.33E-03	1.16E-03	4.60E-07	1.21E-06	1.81E-08	2.38E-07	2.6E-07	0.256114126	2.66E-04	1673	550469	4163499.51
1674	550489	4163499.51	RES	1.69E-03	1.39E-03	5.85E-07	1.45E-06	2.30E-08	2.85E-07	3.1E-07	0.308204895	3.38E-04	1674	550489	4163499.51
1675	550509	4163499.51	RES	2.05E-03	1.62E-03	7.10E-07	1.69E-06	2.79E-08	3.32E-07	3.6E-07	0.360295665	4.10E-04	1675	550509	4163499.51
1676	550529	4163499.51	RES	2.77E-03	2.06E-03	9.59E-07	2.15E-06	3.77E-08	4.23E-07	4.6E-07	0.460373289	5.54E-04	1676	550529	4163499.51
1677	550549	4163499.51	RES	1.81E-03	1.53E-03	6.27E-07	1.60E-06	2.46E-08	3.14E-07	3.4E-07	0.338564214	3.62E-04	1677	550549	4163499.51
1678	550569	4163499.51	RES	1.96E-03	1.63E-03	6.78E-07	1.70E-06	2.67E-08	3.34E-07	3.6E-07	0.361123684	3.92E-04	1678	550569	4163499.51
1679	550589	4163499.51	RES	2.81E-03	2.14E-03	9.73E-07	2.24E-06	3.82E-08	4.39E-07	4.8E-07	0.477332919	5.62E-04	1679	550589	4163499.51
1680	550609	4163499.51	RES	2.02E-03	1.69E-03	6.99E-07	1.77E-06	2.75E-08	3.47E-07	3.7E-07	0.374251386	4.04E-04	1680	550609	4163499.51
1681	550709	4163499.51	WOR	1.16E-03	1.10E-03	1.83E-07	1.73E-07	1.81E-08	0.00E+00	1.8E-08	0.018107755	2.32E-04	1681	550709	4163499.51
1682	550729	4163499.51	WOR	1.07E-03	1.02E-03	1.69E-07	1.61E-07	1.67E-08	0.00E+00	1.7E-08	0.016702843	2.14E-04	1682	550729	4163499.51
1683	550889	4163499.51	RES	6.00E-04	5.60E-04	2.08E-07	5.85E-07	8.16E-09	1.15E-07	1.2E-07	0.123069193	1.20E-04	1683	550889	4163499.51
1684	550929	4163499.51	RES	4.90E-04	4.70E-04	1.70E-07	4.91E-07	6.66E-09	9.64E-08	1.0E-07	0.103105653	9.80E-05	1684	550929	4163499.51
1685	550949	4163499.51	RES	4.40E-04	4.30E-04	1.52E-07	4.49E-07	5.98E-09	8.82E-08	9.4E-08	0.094217859	8.80E-05	1685	550949	4163499.51
1686	550969	4163499.51	RES	4.00E-04	4.00E-04	1.38E-07	4.18E-07	5.44E-09	8.21E-08	8.8E-08	0.087518015	8.00E-05	1686	550969	4163499.51
1687	550989	4163499.51	RES	3.70E-04	3.70E-04	1.28E-07	3.87E-07	5.03E-09	7.59E-08	8.1E-08	0.080954164	7.40E-05	1687	550989	4163499.51
1688	551009	4163499.51	RES	3.40E-04	3.50E-04	1.18E-07	3.66E-07	4.62E-09	7.18E-08	7.6E-08	0.07644227	7.00E-05	1688	551009	4163499.51
1689	551029	4163499.51	RES	3.10E-04	3.30E-04	1.07E-07	3.45E-07	4.22E-09	6.77E-08	7.2E-08	0.071930376	6.60E-05	1689	551029	4163499.51
1690	551049	4163499.51	RES	2.90E-04	3.10E-04	1.00E-07	3.24E-07	3.94E-09	6.36E-08	6.8E-08	0.067554475	6.20E-05	1690	551049	4163499.51
1691	551069	4163499.51	RES	2.70E-04	2.90E-04	9.35E-08	3.03E-07	3.67E-09	5.95E-08	6.3E-08	0.063178574	5.80E-05	1691	551069	4163499.51
1692	551089	4163499.51	RES	2.60E-04	2.80E-04	9.00E-08	2.93E-07	3.54E-09	5.75E-08	6.1E-08	0.060990624	5.60E-05	1692	551089	4163499.51
1693	551109	4163499.51	RES	2.40E-04	2.60E-04	8.31E-08	2.72E-07	3.26E-09	5.34E-08	5.7E-08	0.056614723	5.20E-05	1693	551109	4163499.51
1694	549909	4163519.51	RES	2.40E-04	3.20E-04	8.31E-08	3.34E-07	3.26E-09	6.57E-08	6.9E-08	0.068926467	6.40E-05	1694	549909	4163519.51
1695	549969	4163519.51	RES	2.60E-04	3.40E-04	9.00E-08	3.55E-07	3.54E-09	6.98E-08	7.3E-08	0.073302367	6.80E-05	1695	549969	4163519.51
1696	549989	4163519.51	RES	2.70E-04	3.50E-04	9.35E-08	3.66E-07	3.67E-09	7.18E-08	7.5E-08	0.075490318	7.00E-05	1696	549989	4163519.51
1697	550009	4163519.51	RES	2.80E-04	3.60E-04	9.69E-08	3.76E-07	3.81E-09	7.39E-08	7.8E-08	0.077678268	7.20E-05	1697	550009	4163519.51
1698	550029	4163519.51	RES	2.90E-04	3.70E-04	1.00E-07	3.87E-07	3.94E-09	7.59E-08	8.0E-08	0.079866218	7.40E-05	1698	550029	4163519.51
1699	550049	4163519.51	RES	3.10E-04	3.80E-04	1.07E-07	3.97E-07	4.22E-09	7.80E-08	8.2E-08	0.082190162	7.60E-05	1699	550049	4163519.51
1700	550089	4163519.51	RES	3.60E-04	4.10E-04	1.25E-07	4.29E-07	4.90E-09	8.41E-08	8.9E-08	0.089025999	8.20E-05	1700	550089	4163519.51
1701	550109	4163519.51	RES	4.00E-04	4.30E-04	1.38E-07	4.49E-07	5.44E-09	8.82E-08	9.4E-08	0.093673886	8.60E-05	1701	550109	4163519.51
1702	550129	4163519.51	RES	4.70E-04	4.80E-04	1.63E-07	5.02E-07	6.39E-09	9.85E-08	1.0E-07	0.104885624	9.60E-05	1702	550129	4163519.51
1703	550149	4163519.51	RES	6.00E-04	5.50E-04	2.08E-07	5.75E-07	8.16E-09	1.13E-07	1.2E-07	0.121017236	1.20E-04	1703	550149	4163519.51
1704	550169	4163519.51	RES	7.70E-04	6.50E-04	2.67E-07	6.79E-07	1.05E-08	1.33E-07	1.4E-07	0.143848692	1.54E-04	1704	550169	4163519.51
1705	550189	4163519.51	RES	8.00E-04	6.70E-04	2.77E-07	7.00E-07	1.09E-08	1.37E-07	1.5E-07	0.148360585	1.60E-04	1705	550189	4163519.51
1706	550209	4163519.51	RES	8.30E-04	6.90E-04	2.87E-07	7.21E-07	1.13E-08	1.42E-07	1.5E-07	0.152872479	1.66E-04	1706	550209	4163519.51
1707	550229	4163519.51	RES	8.90E-04	7.30E-04	3.08E-07	7.63E-07	1.21E-08	1.50E-07	1.6E-07	0.161896267	1.78E-04	1707	550229	4163519.51
1708	550249	4163519.51	RES	9.40E-04	7.60E-04	3.25E-07	7.94E-07	1.28E-08	1.56E-07	1.7E-07	0.168732105	1.88E-04	1708	550249	4163519.51
1709	550269	4163519.51	RES	9.70E-04	7.80E-04	3.36E-07	8.15E-07	1.32E-08	1.60E-07	1.7E-07	0.173243998	1.94E-04	1709	550269	4163519.51
1710	550289	4163519.51	RES	9.80E-04	7.90E-04	3.39E-07	8.26E-07	1.33E-08	1.62E-07	1.8E-07	0.175431949	1.96E-04	1710	550289	4163519.51
1711	550309	4163519.51	RES	9.40E-04	7.70E-04	3.25E-07	8.05E-07	1.28E-08	1.58E-07	1.7E-07	0.170784062	1.88E-04	1711	550309	4163519.51
1712	550329	4163519.51	RES	9.50E-04	7.80E-04	3.29E-07	8.15E-07	1.29E-08	1.60E-07	1.7E-07	0.172972012	1.90E-04	1712	550329	4163519.51
1713	550349	4163519.51	RES	9.60E-04	8.00E-04	3.32E-07	8.36E-07	1.31E-08	1.64E-07	1.8E-07	0.17721192	1.92E-04	1713	550349	4163519.51
1714	550369	4163519.51	RES	9.70E-04	8.20E-04	3.36E-07	8.57E-07	1.32E-08	1.68E-07	1.8E-07	0.181451827	1.94E-04	1714	550369	4163519.51
1715	550389	4163519.51	RES	9.70E-04	8.30E-04	3.36E-07	8.68E-07	1.32E-08	1.70E-07	1.8E-07	0.183503784	1.94E-04	1715	550389	4163519.51
1716	550469	4163519.51	RES	1.45E-03	1.19E-03	5.02E-07	1.24E-06	1.97E-08	2.44E-07	2.6E-07	0.263901915	2.90E-04	1716	550469	4163519.51
1717	550489	4163519.51	RES	1.96E-03	1.50E-03	6.78E-07	1.57E-06	2.67E-08	3.08E-07	3.3E-07	0.33444824	3.92E-04	1717	550489	4163519.51
1718	550509	4163519.51	RES	2.74E-03	1.98E-03	9.48E-07	2.07E-06	3.73E-08	4.06E-07	4.4E-07	0.443549652	5.48E-04	1718	550509	4163519.51
1719	550529	4163519.51	RES	2.55E-03	1.88E-03	8.83E-07	1.96E-06	3.47E-08	3.86E-07	4.2E-07	0.42044621	5.10E-04	1719	550529	4163519.51
1720	550569	4163519.51	RES	2.93E-03	2.14E-03	1.01E-06	2.24E-06	3.98E-08	4.39E-07	4.8E-07	0.478964837	5.86E-04	1720	550569	4163519.51
1721	550589	4163519.51	RES	2.10E-03	1.68E-03	7.27E-07	1.76E-06	2.86E-08	3.45E-07	3.7E-07	0.373287374	4.20E-04	1721	550589	4163519.51
1722	550709	4163519.51	WOR	1.25E-03	1.12E-03	1.97E-07	1.76E-07	1.95E-08	0.00E+00	2.0E-08	0.019512667	2.50E-04	1722	550709	4163519.51
1723	550729	4163519.51	WOR	1.14E-03	1.03E-03	1.80E-07	1.62E-07	1.78E-08	0.00E+00	1.8E-08	0.017795552	2.28E-04	1723	550729	4163519.51
1724	550909	4163519.51	RES	5.30E-04	4.90E-04	1.83E-07	5.12E-07	7.21E-09	1.01E-07	1.1E-07	0.107753541	1.06E-04	1724	550909	4163519.51
1725	550929	4163519.51	RES	4.80E-04	4.50E-04	1.66E-07	4.70E-07	6.53E-09	9.23E-08	9.9E-08	0.098865746	9.60E-05	1725	550929	4163519.51
1726	550949	4163519.51	RES	4.30E-04	4.10E-04	1.49E-07	4.29E-07	5.85E-09	8.41E-08	9.0E-08	0.089977951	8.60E-05	1726	550949	4163519.51
1727	550969	4163519.51	RES	3.90E-04	3.80E-04	1.35E-07	3.97E-07	5.30E-09	7.80E-08	8.3E-08	0.083278107	7.80E-05	1727	550969	4163519.51
1728	550989	4163519.51	RES	3.50E-04	3.50E-04	1.21E-07	3.66E-07	4.76E-09	7.18E-08	7.7E-08	0.076578263	7.00E-05	1728	550989	4163519.51
1729	551009	4163519.51	RES	3.20E-04	3.30E-04	1.11E-07	3.45E-07	4.35E-09	6.77E-08	7.2E-08	0.072066369	6.60E-05	1729	551009	4163519.51
1730	551029	4163519.51	RES	3.00E-04	3.10E-04	1.04E-07	3.24E-07	4.08E-09	6.36E-08	6.8E-08	0.067690468	6.20E-05	1730	551029	4163519.51
1731	551049	4163519.51	RES	2.80E-04	2.90E-04	9.69E-08	3.03E-07	3.81E-09	5.95E-08	6.3E-08	0.063314567	5.80E-05	1731	551049	4163519.51
1732	551069	4163519.51	RES	2.60E-04	2.80E-04	9.00E-08	2.93E-07	3.54E-09	5.75E-08	6.1E-08	0.060990624	5.60E-05	1732	551069	4163519.51
1733	551089	4163519.51	RES	2.40E-04	2.60E-04	8.31E-08	2.72E-07	3.26E-09	5.34E-08	5.7E-08	0.056614723	5.20E-05	1733	551089	4163519.51
1734	551109	4163519.51	RES	2.30E-04	2.50E-04	7.96E-08	2.61E-07	3.13E-09	5.13E-08	5.4E-08	0.054426773	5.00E-05	1734	551109	4163519.51
1735	549909	4163539.51	RES	2.30E-04	3.00E-04	7.96E-08	3.14E-07	3.13E-09	6.16E-08	6.5E-08	0.064686559	6.00E-05	1735	549909	4163539.51
1736	550029	4163539.51	RES	2.80E-04	3.40E-04	9.69E-08	3.55E-07	3.81E-09	6.98E-08	7.4E-08	0.073574354	6.80E-05	1736	550029	4163539.51
1737	550049	4163539.51	RES	2.90E-04	3.50E-04	1.00E-07	3.66E-07	3.94E-09	7.18E-08	7.6E-08	0.075762304	7.00E-05	1737	550049	4163539.51
1738	550069	4163539.51	RES	3.10E-04	3.70E-04	1.07E-07	3.87E-07	4.22E-09	7.59E-08	8.0E-08	0.080138205	7.40E-05	1738	550069	4163539.51
1739	550089	4163539.51	RES	3.40E-04	3.90E-04	1.18E-07	4.08E-07	4.62E-09	8.00E-08	8.5E-08	0.084650099	7.80E-05	1739	550089	4163539.51
1740	550109	4163539.51	RES	4.00E-04	4.20E-04	1.38E-07	4.39E-07	5.44E-09	8.62E-08	9.2E-08	0.091621929	8.40E-05	1740	550109	4163539.51
1741	550129	4163539.51	RES	5.00E-04	4.80E-04	1.73E-07	5.02E-07	6.80E-09	9.85E-08	1.1E-07	0.105293604	1.00E-04	1741	550129	4163539.51
1742	550149	4163539.51	RES	7.00E-04	6.00E-04	2.42E-07	6.27E-07	9.52E-09	1.23E-07	1.3E-07	0.132636953	1.40E-04	1742	550149	4163539.51
1743	550169	4163539.51	RES	1.08E-03	8.10E-04	3.74E-07	8.47E-07	1.47E-08	1.66E-07	1.8E-07	0.180895795	2.16E-04	1743	550169	4163539.51
1744	550189	4163539.51	RES	9.40E-04	7.30E-04	3.25E-07	7.63E-07	1.28E-08	1.50E-07	1.6E-07	0.162576233	1.88E-04	1744	550189	4163539.51
1745	550209	4163539.51	RES	1.10E-03	8.30E-04	3.81E-07	8.68E-07	1.50E-08	1.70E-07	1.9E-07	0.185271695	2.20E-04	1745	550209	4163539.51
1746	550229	4163539.51	RES	1.22E-03	9.00E-04	4.22E-07	9.41E-07	1.66E-08	1.85E-07	2.0E-07	0.201267314	2.44E-04	1746	550229	4163539.51
1747	550249	4163539.51	RES	1.51E-03	1.07E-03	5.23E-07	1.12E-06	2.05E-08	2.20E-07	2.4E-07	0.240094388	3.02E-04	1747	550249	4163539.51
1748	550269	4163539.51	RES	1.49E-03	1.06E-03	5.16E-07	1.11E-06	2.03E-08	2.18E-07	2.4E-07	0.237770444	2.98E-04	1748	550269	4163539.51
1749	550289	4163539.51	RES	1.47E-03	1.05E-03	5.09E-07	1.10E-06	2.00E-08	2.15E-07	2.4E-07	0.235446501	2.94E-04	1749	550289	4163539.51
1750	550309	4163539.51	RES	1.38E-03	1.00E-03	4.78E-07	1.05E-06	1.88E-08	2.05E-07	2.2E-07	0.223962776	2.76E-04	1750	550309	4163539.51
1751	550329	4163539.51	RES	1.35E-03	9.90E-04	4.67E-07	1.03E-06	1.84E-08	2.03E-07	2.2E-07	0.22150284	2.70E-04	1751	550329	4163539.51
1752	550349	4163539.51	RES	1.31E-03	9.80E-04	4.53E-07	1.02E-06	1.78E-08	2.01E-07	2.2E-07	0.21890691	2.62E-04	1752	550349	4163539.51
1753	550369	4163539.51	RES	1.27E-03	9.60E-04	4.40E-07	1.00E-06	1.73E-08	1.97E-07	2.1E-07	0.214259023	2.54E-04	1753	550369	4163539.51
1754	550389	4163539.51	RES	1.14E-03	9.10E-04	3.95E-07	9.51E-07	1.55E-08	1.87E-07	2.0E-07	0.202231326	2.28E-04	1754	550389	4163539.51
1755	550409	4163539.51	RES	1.20E-03	9.50E-04	4.15E-07	9.93E-07	1.63E-08	1.95E-07	2.1E-07	0.211255114	2.40E-04	1755	550409	4163539.51
1756	550429	4163539.51	RES	1.30E-03	1.02E-03	4.50E-07	1.07E-06	1.77E-08	2.09E-07	2.3E-07	0.226978746	2.60E-04	1756	550429	4163539.51
1757	550489	4163539.51	RES	2.39E-03	1.71E-03	8.27E-07	1.79E-06	3.25E-08	3.51E-07	3.8E-07	0.383387047	4.78E-04	1757	550489	4163539.51
1758	550509	4163539.51	RES	1.86E-03	1.43E-03	6.44E-07	1.49E-06	2.53E-08	2.93E-07	3.2E-07	0.318724608	3.72E-04	1758	550509	4163539.51
1759	550549	4163539.51	RES	2.51E-03	1.84E-03	8.69E-07	1.92E-06	3.41E-08	3.78E-07	4.1E-07	0.411694408	5.02E-04	1759	550549	4163539.51
1760	550569	4163539.51	RES	2.15E-03	1.65E-03	7.44E-07	1.72E-06	2.92E-08	3.39E-07	3.7E-07	0.367811468	4.30E-04	1760	550569	4163539.51
1761	550709	4163539.51	WOR	1.52E-03	1.25E-03	2.39E-07	1.97E-07	2.37E-08	0.00E+00	2.4E-08	0.023727403	3.04E-04	1761	550709	4163539.51
1762	550729	4163539.51	WOR	1.34E-03	1.12E-03	2.11E-07	1.76E-07	2.09E-08	0.00E+00	2.1E-08	0.020917579	2.68E-04	1762	550729	4163539.51
1763	550889	4163539.51	RES	5.90E-04	5.30E-04	2.04E-07	5.54E-07	8.02E-09	1.09E-07	1.2E-07	0.116777328	1.18E-04	1763	550889	4163539.51
1764	550909	4163539.51	RES	5.20E-04	4.80E-04	1.80E-07	5.02E-07	7.07E-09	9.85E-08	1.1E-07	0.10556559	1.04E-04	1764	550909	4163539.51
1765	550929	4163539.51	RES	4.60E-04	4.30E-04	1.59E-07	4.49E-07	6.26E-09	8.82E-08	9.4E-08	0.094489845	9.20E-05	1765	550929	4163539.51
1766	550969	4163539.51	RES	3.70E-04	3.60E-04	1.28E-07	3.76E-07	5.03E-09	7.39E-08	7.9E-08	0.078902206	7.40E-05	1766	550969	4163539.51
1767	550989	4163539.51	RES	3.40E-04	3.40E-04	1.18E-07	3.55E-07	4.62E-09	6.98E-08	7.4E-08	0.074390312	6.80E-05	1767	550989	4163539.51
1768	551009	4163539.51	RES	3.10E-04	3.10E-04	1.07E-07	3.24E-07	4.22E-09	6.36E-08	6.8E-08	0.067826461	6.20E-05	1768	551009	4163539.51
1769	551029	4163539.51	RES	2.80E-04	2.90E-04	9.69E-08	3.03E-07	3.81E-09	5.95E-08	6.3E-08	0.063314567	5.80E-05	1769	551029	4163539.51
1770	551049	4163539.51	RES	2.60E-04	2.80E-04	9.00E-08	2.93E-07	3.54E-09	5.75E-08	6.1E-08	0.060990624	5.60E-05	1770	551049	4163539.51
1771	551069	4163539.51	RES	2.40E-04	2.60E-04	8.31E-08	2.72E-07	3.26E-09	5.34E-08	5.7E-08	0.056614723	5.20E-05	1771	551069	4163539.51
1772	551089	4163539.51	RES	2.30E-04	2.50E-04	7.96E-08	2.61E-07	3.13E-09	5.13E-08	5.4E-08	0.054426773	5.00E-05	1772	551089	4163539.51
1773	551109	4163539.51	RES	2.10E-04	2.30E-04	7.27E-08	2.40E-07	2.86E-09	4.72E-08	5.0E-08	0.050050872	4.60E-05	1773	551109	4163539.51
1774	550069	4163559.51	RES	3.00E-04	3.50E-04	1.04E-07	3.66E-07	4.08E-09	7.18E-08	7.6E-08	0.075898297	7.00E-05	1774	550069	4163559.51
1775	550089	4163559.51	RES	3.30E-04	3.70E-04	1.14E-07	3.87E-07	4.49E-09	7.59E-08	8.0E-08	0.080410191	7.40E-05	1775	550089	4163559.51
1776	550109	4163559.51	RES	3.90E-04	4.00E-04	1.35E-07	4.18E-07	5.30E-09	8.21E-08	8.7E-08	0.087382021	8.00E-05	1776	550109	4163559.51
1777	550129	4163559.51	RES	5.10E-04	4.70E-04	1.77E-07	4.91E-07	6.94E-09	9.64E-08	1.0E-07	0.10337764	1.02E-04	1777	550129	4163559.51
1778	550149	4163559.51	RES	7.70E-04	6.20E-04	2.67E-07	6.48E-07	1.05E-08	1.27E-07	1.4E-07	0.13769282	1.54E-04	1778	550149	4163559.51
1779	550169	4163559.51	RES	1.04E-03	7.80E-04	3.60E-07	8.15E-07	1.41E-08	1.60E-07	1.7E-07	0.17419595	2.08E-04	1779	550169	4163559.51
1780	550189	4163559.51	RES	8.90E-04	6.90E-04	3.08E-07	7.21E-07	1.21E-08	1.42E-07	1.5E-07	0.153688438	1.78E-04	1780	550189	4163559.51
1781	550209	4163559.51	RES	1.01E-03	7.60E-04	3.50E-07	7.94E-07	1.37E-08	1.56E-07	1.7E-07	0.169684057	2.02E-04	1781	550209	4163559.51
1782	550329	4163559.51	RES	1.08E-03	8.20E-04	3.74E-07	8.57E-07	1.47E-08	1.68E-07	1.8E-07	0.182947752	2.16E-04	1782	550329	4163559.51
1783	550349	4163559.51	RES	1.10E-03	8.40E-04	3.81E-07	8.78E-07	1.50E-08	1.72E-07	1.9E-07	0.187323653	2.20E-04	1783	550349	4163559.51
1784	550369	4163559.51	RES	1.15E-03	8.80E-04	3.98E-07	9.20E-07	1.56E-08	1.81E-07	2.0E-07	0.196211447	2.30E-04	1784	550369	4163559.51
1785	550389	4163559.51	RES	1.18E-03	9.00E-04	4.08E-07	9.41E-07	1.60E-08	1.85E-07	2.0E-07	0.200723341	2.36E-04	1785	550389	4163559.51

1786	550409	4163559.51	RES	1.64E-03	1.19E-03	5.68E-07	1.24E-06	2.23E-08	2.44E-07	2.7E-07	0.266485785	3.28E-04	1786	550409	4163559.51
1787	550429	4163559.51	RES	1.64E-03	1.20E-03	5.68E-07	1.25E-06	2.23E-08	2.46E-07	2.7E-07	0.268537743	3.28E-04	1787	550429	4163559.51
1788	550449	4163559.51	RES	1.75E-03	1.28E-03	6.06E-07	1.34E-06	2.38E-08	2.63E-07	2.9E-07	0.286449325	3.50E-04	1788	550449	4163559.51
1789	550469	4163559.51	RES	2.16E-03	1.53E-03	7.48E-07	1.60E-06	2.94E-08	3.14E-07	3.4E-07	0.343323974	4.32E-04	1789	550469	4163559.51
1790	550529	4163559.51	RES	2.57E-03	1.83E-03	8.90E-07	1.91E-06	3.50E-08	3.76E-07	4.1E-07	0.41045841	5.14E-04	1790	550529	4163559.51
1791	550549	4163559.51	RES	2.29E-03	1.68E-03	7.93E-07	1.76E-06	3.11E-08	3.45E-07	3.8E-07	0.375871244	4.58E-04	1791	550549	4163559.51
1792	550569	4163559.51	RES	1.95E-03	1.50E-03	6.75E-07	1.57E-06	2.65E-08	3.08E-07	3.3E-07	0.334312247	3.90E-04	1792	550569	4163559.51
1793	550589	4163559.51	RES	1.73E-03	1.38E-03	5.99E-07	1.44E-06	2.35E-08	2.83E-07	3.1E-07	0.306696911	3.46E-04	1793	550589	4163559.51
1794	550609	4163559.51	RES	1.57E-03	1.30E-03	5.43E-07	1.36E-06	2.14E-08	2.67E-07	2.9E-07	0.288105363	3.14E-04	1794	550609	4163559.51
1795	550889	4163559.51	WOR	5.70E-04	5.10E-04	8.98E-08	8.03E-08	8.90E-09	0.00E+00	8.9E-09	0.008897776	1.14E-04	1795	550889	4163559.51
1796	550909	4163559.51	WOR	4.90E-04	4.60E-04	7.72E-08	7.25E-08	7.65E-09	0.00E+00	7.6E-09	0.007648965	9.80E-05	1796	550909	4163559.51
1797	550929	4163559.51	RES	4.30E-04	4.10E-04	1.49E-07	4.29E-07	5.85E-09	8.41E-08	9.0E-08	0.089977951	8.60E-05	1797	550929	4163559.51
1798	550949	4163559.51	RES	3.90E-04	3.80E-04	1.35E-07	3.97E-07	5.30E-09	7.80E-08	8.3E-08	0.083278107	7.80E-05	1798	550949	4163559.51
1799	550969	4163559.51	RES	3.50E-04	3.50E-04	1.21E-07	3.66E-07	4.76E-09	7.18E-08	7.7E-08	0.076578263	7.00E-05	1799	550969	4163559.51
1800	550989	4163559.51	RES	3.20E-04	3.20E-04	1.11E-07	3.34E-07	4.35E-09	6.57E-08	7.0E-08	0.070014412	6.40E-05	1800	550989	4163559.51
1801	551009	4163559.51	RES	2.90E-04	3.00E-04	1.00E-07	3.14E-07	3.94E-09	6.16E-08	6.6E-08	0.065502518	6.00E-05	1801	551009	4163559.51
1802	551029	4163559.51	RES	2.70E-04	2.80E-04	9.35E-08	2.93E-07	3.67E-09	5.75E-08	6.1E-08	0.061126617	5.60E-05	1802	551029	4163559.51
1803	551049	4163559.51	RES	2.50E-04	2.60E-04	8.65E-08	2.72E-07	3.40E-09	5.34E-08	5.7E-08	0.056750716	5.20E-05	1803	551049	4163559.51
1804	551069	4163559.51	RES	2.30E-04	2.50E-04	7.96E-08	2.61E-07	3.13E-09	5.13E-08	5.4E-08	0.054426773	5.00E-05	1804	551069	4163559.51
1805	551089	4163559.51	RES	2.20E-04	2.30E-04	7.62E-08	2.40E-07	2.99E-09	4.72E-08	5.0E-08	0.050186865	4.60E-05	1805	551089	4163559.51
1806	551109	4163559.51	RES	2.00E-04	2.20E-04	6.92E-08	2.30E-07	2.72E-09	4.51E-08	4.8E-08	0.047862922	4.40E-05	1806	551109	4163559.51
1807	550129	4163579.51	RES	5.10E-04	4.60E-04	1.77E-07	4.81E-07	6.94E-09	9.44E-08	1.0E-07	0.101325683	1.02E-04	1807	550129	4163579.51
1808	550149	4163579.51	RES	7.70E-04	6.10E-04	2.67E-07	6.38E-07	1.05E-08	1.25E-07	1.4E-07	0.135640863	1.54E-04	1808	550149	4163579.51
1809	550169	4163579.51	RES	6.80E-04	5.50E-04	2.35E-07	5.75E-07	9.25E-09	1.13E-07	1.2E-07	0.122105181	1.36E-04	1809	550169	4163579.51
1810	550189	4163579.51	RES	9.00E-04	6.80E-04	3.12E-07	7.11E-07	1.22E-08	1.40E-07	1.5E-07	0.151772474	1.80E-04	1810	550189	4163579.51
1811	550209	4163579.51	RES	9.00E-04	6.80E-04	3.12E-07	7.11E-07	1.22E-08	1.40E-07	1.5E-07	0.151772474	1.80E-04	1811	550209	4163579.51
1812	550449	4163579.51	RES	1.44E-03	1.08E-03	4.98E-07	1.13E-06	1.96E-08	2.22E-07	2.4E-07	0.241194393	2.88E-04	1812	550449	4163579.51
1813	550469	4163579.51	RES	1.87E-03	1.34E-03	6.47E-07	1.40E-06	2.54E-08	2.75E-07	3.0E-07	0.300392986	3.74E-04	1813	550469	4163579.51
1814	550489	4163579.51	RES	2.18E-03	1.54E-03	7.55E-07	1.61E-06	2.96E-08	3.16E-07	3.5E-07	0.345647918	4.36E-04	1814	550489	4163579.51
1815	550509	4163579.51	RES	2.58E-03	1.78E-03	8.93E-07	1.86E-06	3.51E-08	3.65E-07	4.0E-07	0.400334617	5.16E-04	1815	550509	4163579.51
1816	550529	4163579.51	RES	3.22E-03	2.17E-03	1.11E-06	2.27E-06	4.38E-08	4.45E-07	4.9E-07	0.48906451	6.44E-04	1816	550529	4163579.51
1817	550549	4163579.51	RES	2.56E-03	1.80E-03	8.86E-07	1.88E-06	3.48E-08	3.69E-07	4.0E-07	0.404166545	5.12E-04	1817	550549	4163579.51
1818	550569	4163579.51	RES	2.30E-03	1.66E-03	7.96E-07	1.74E-06	3.13E-08	3.41E-07	3.7E-07	0.371903322	4.60E-04	1818	550569	4163579.51
1819	550589	4163579.51	RES	1.97E-03	1.48E-03	6.82E-07	1.55E-06	2.68E-08	3.04E-07	3.3E-07	0.330480319	3.94E-04	1819	550589	4163579.51
1820	550609	4163579.51	RES	1.77E-03	1.38E-03	6.13E-07	1.44E-06	2.41E-08	2.83E-07	3.1E-07	0.307240883	3.54E-04	1820	550609	4163579.51
1821	550709	4163579.51	RES	3.18E-03	2.15E-03	1.10E-06	2.25E-06	4.32E-08	4.41E-07	4.8E-07	0.484416623	6.36E-04	1821	550709	4163579.51
1822	550729	4163579.51	RES	2.65E-03	1.84E-03	9.17E-07	1.92E-06	3.60E-08	3.78E-07	4.1E-07	0.413598313	5.30E-04	1822	550729	4163579.51
1823	550869	4163579.51	WOR	6.20E-04	5.50E-04	9.77E-08	8.66E-08	9.68E-09	0.00E+00	9.7E-09	0.009678283	1.24E-04	1823	550869	4163579.51
1824	550889	4163579.51	WOR	5.30E-04	4.80E-04	8.35E-08	7.56E-08	8.27E-09	0.00E+00	8.3E-09	0.008273371	1.06E-04	1824	550889	4163579.51
1825	550909	4163579.51	WOR	4.60E-04	4.30E-04	7.25E-08	6.77E-08	7.18E-09	0.00E+00	7.2E-09	0.007180661	9.20E-05	1825	550909	4163579.51
1826	550949	4163579.51	RES	3.60E-04	3.60E-04	1.25E-07	3.76E-07	4.90E-09	7.39E-08	7.9E-08	0.078766213	7.20E-05	1826	550949	4163579.51
1827	550969	4163579.51	RES	3.30E-04	3.30E-04	1.14E-07	3.45E-07	4.49E-09	6.77E-08	7.2E-08	0.072202362	6.60E-05	1827	550969	4163579.51
1828	550989	4163579.51	RES	3.00E-04	3.00E-04	1.04E-07	3.14E-07	4.08E-09	6.16E-08	6.6E-08	0.065638511	6.00E-05	1828	550989	4163579.51
1829	551009	4163579.51	RES	2.70E-04	2.80E-04	9.35E-08	2.93E-07	3.67E-09	5.75E-08	6.1E-08	0.061126617	5.60E-05	1829	551009	4163579.51
1830	551029	4163579.51	RES	2.50E-04	2.60E-04	8.65E-08	2.72E-07	3.40E-09	5.34E-08	5.7E-08	0.056750716	5.20E-05	1830	551029	4163579.51
1831	551049	4163579.51	RES	2.40E-04	2.50E-04	8.31E-08	2.61E-07	3.26E-09	5.13E-08	5.5E-08	0.054562766	5.00E-05	1831	551049	4163579.51
1832	551069	4163579.51	RES	2.20E-04	2.30E-04	7.62E-08	2.40E-07	2.99E-09	4.72E-08	5.0E-08	0.050186865	4.60E-05	1832	551069	4163579.51
1833	551089	4163579.51	RES	2.00E-04	2.20E-04	6.92E-08	2.30E-07	2.72E-09	4.51E-08	4.8E-08	0.047862922	4.40E-05	1833	551089	4163579.51
1834	551109	4163579.51	RES	1.90E-04	2.10E-04	6.58E-08	2.19E-07	2.58E-09	4.31E-08	4.6E-08	0.045674971	4.20E-05	1834	551109	4163579.51
1835	550149	4163599.51	RES	7.30E-04	5.70E-04	2.53E-07	5.96E-07	9.93E-09	1.17E-07	1.3E-07	0.126889061	1.46E-04	1835	550149	4163599.51
1836	550169	4163599.51	RES	5.90E-04	5.00E-04	2.04E-07	5.23E-07	8.02E-09	1.03E-07	1.1E-07	0.110621457	1.18E-04	1836	550169	4163599.51
1837	550189	4163599.51	RES	5.30E-04	4.60E-04	1.83E-07	4.81E-07	7.21E-09	9.44E-08	1.0E-07	0.101597669	1.06E-04	1837	550189	4163599.51
1838	550209	4163599.51	RES	7.40E-04	5.80E-04	2.56E-07	6.06E-07	1.01E-08	1.19E-07	1.3E-07	0.129077012	1.48E-04	1838	550209	4163599.51
1839	550309	4163599.51	RES	6.00E-04	5.10E-04	2.08E-07	5.33E-07	8.16E-09	1.05E-07	1.1E-07	0.112809407	1.20E-04	1839	550309	4163599.51
1840	550569	4163599.51	RES	1.89E-03	1.40E-03	6.54E-07	1.46E-06	2.57E-08	2.87E-07	3.1E-07	0.312976716	3.78E-04	1840	550569	4163599.51
1841	550589	4163599.51	RES	2.33E-03	1.66E-03	8.07E-07	1.74E-06	3.17E-08	3.41E-07	3.7E-07	0.372311302	4.66E-04	1841	550589	4163599.51
1842	550609	4163599.51	RES	2.19E-03	1.59E-03	7.58E-07	1.66E-06	2.98E-08	3.26E-07	3.6E-07	0.356043697	4.38E-04	1842	550609	4163599.51
1843	550709	4163599.51	RES	2.53E-03	1.76E-03	8.76E-07	1.84E-06	3.44E-08	3.61E-07	4.0E-07	0.395550737	5.06E-04	1843	550709	4163599.51
1844	550729	4163599.51	RES	3.22E-03	2.15E-03	1.11E-06	2.25E-06	4.38E-08	4.41E-07	4.8E-07	0.484960596	6.44E-04	1844	550729	4163599.51
1845	550889	4163599.51	WOR	4.80E-04	4.50E-04	7.56E-08	7.09E-08	7.49E-09	0.00E+00	7.5E-09	0.007492864	9.60E-05	1845	550889	4163599.51
1846	550909	4163599.51	WOR	4.20E-04	4.00E-04	6.62E-08	6.30E-08	6.56E-09	0.00E+00	6.6E-09	0.006556256	8.40E-05	1846	550909	4163599.51
1847	550929	4163599.51	RES	3.70E-04	3.70E-04	1.28E-07	3.87E-07	5.03E-09	7.59E-08	8.1E-08	0.080954164	7.40E-05	1847	550929	4163599.51
1848	550949	4163599.51	RES	3.40E-04	3.40E-04	1.18E-07	3.55E-07	4.62E-09	6.98E-08	7.4E-08	0.074390312	6.80E-05	1848	550949	4163599.51
1849	550969	4163599.51	RES	3.00E-04	3.10E-04	1.04E-07	3.24E-07	4.08E-09	6.36E-08	6.8E-08	0.067690468	6.20E-05	1849	550969	4163599.51
1850	550989	4163599.51	RES	2.80E-04	2.90E-04	9.69E-08	3.03E-07	3.81E-09	5.95E-08	6.3E-08	0.063314567	5.80E-05	1850	550989	4163599.51
1851	551009	4163599.51	RES	2.60E-04	2.70E-04	9.00E-08	2.82E-07	3.54E-09	5.54E-08	5.9E-08	0.058938667	5.40E-05	1851	551009	4163599.51
1852	551029	4163599.51	RES	2.40E-04	2.50E-04	8.31E-08	2.61E-07	3.26E-09	5.13E-08	5.5E-08	0.054562766	5.00E-05	1852	551029	4163599.51
1853	551049	4163599.51	RES	2.20E-04	2.40E-04	7.62E-08	2.51E-07	2.99E-09	4.92E-08	5.2E-08	0.052238822	4.80E-05	1853	551049	4163599.51
1854	551069	4163599.51	RES	2.10E-04	2.20E-04	7.27E-08	2.30E-07	2.86E-09	4.51E-08	4.8E-08	0.047998915	4.40E-05	1854	551069	4163599.51
1855	551089	4163599.51	RES	1.90E-04	2.10E-04	6.58E-08	2.19E-07	2.58E-09	4.31E-08	4.6E-08	0.045674971	4.20E-05	1855	551089	4163599.51
1856	551109	4163599.51	RES	1.80E-04	2.00E-04	6.23E-08	2.09E-07	2.45E-09	4.10E-08	4.3E-08	0.043487021	4.00E-05	1856	551109	4163599.51
1857	549909	4163619.51	RES	1.90E-04	2.40E-04	6.58E-08	2.51E-07	2.58E-09	4.92E-08	5.2E-08	0.051830843	4.80E-05	1857	549909	4163619.51
1858	549929	4163619.51	RES	1.90E-04	2.50E-04	6.58E-08	2.61E-07	2.58E-09	5.13E-08	5.4E-08	0.0538828	5.00E-05	1858	549929	4163619.51
1859	549949	4163619.51	RES	2.00E-04	2.50E-04	6.92E-08	2.61E-07	2.72E-09	5.13E-08	5.4E-08	0.054018793	5.00E-05	1859	549949	4163619.51
1860	549969	4163619.51	RES	2.00E-04	2.60E-04	6.92E-08	2.72E-07	2.72E-09	5.34E-08	5.6E-08	0.056070751	5.20E-05	1860	549969	4163619.51
1861	549989	4163619.51	RES	2.10E-04	2.60E-04	7.27E-08	2.72E-07	2.86E-09	5.34E-08	5.6E-08	0.056206744	5.20E-05	1861	549989	4163619.51
1862	550009	4163619.51	RES	2.20E-04	2.70E-04	7.62E-08	2.82E-07	2.99E-09	5.54E-08	5.8E-08	0.058394694	5.40E-05	1862	550009	4163619.51
1863	550149	4163619.51	RES	6.60E-04	5.20E-04	2.28E-07	5.44E-07	8.98E-09	1.07E-07	1.2E-07	0.115677323	1.32E-04	1863	550149	4163619.51
1864	550169	4163619.51	RES	5.10E-04	4.40E-04	1.77E-07	4.60E-07	6.94E-09	9.03E-08	9.7E-08	0.097221768	1.02E-04	1864	550169	4163619.51
1865	550189	4163619.51	RES	4.50E-04	4.10E-04	1.56E-07	4.29E-07	6.12E-09	8.41E-08	9.0E-08	0.090249938	9.00E-05	1865	550189	4163619.51
1866	550209	4163619.51	RES	6.50E-04	5.20E-04	2.25E-07	5.44E-07	8.84E-09	1.07E-07	1.2E-07	0.11554133	1.30E-04	1866	550209	4163619.51
1867	550289	4163619.51	RES	4.60E-04	4.10E-04	1.59E-07	4.29E-07	6.26E-09	8.41E-08	9.0E-08	0.090385931	9.20E-05	1867	550289	4163619.51
1868	550309	4163619.51	RES	4.70E-04	4.20E-04	1.63E-07	4.39E-07	6.39E-09	8.62E-08	9.3E-08	0.092573881	9.40E-05	1868	550309	4163619.51
1869	550329	4163619.51	RES	4.90E-04	4.40E-04	1.70E-07	4.60E-07	6.66E-09	9.03E-08	9.7E-08	0.096949782	9.80E-05	1869	550329	4163619.51
1870	550349	4163619.51	RES	5.10E-04	4.60E-04	1.77E-07	4.81E-07	6.94E-09	9.44E-08	1.0E-07	0.101325683	1.02E-04	1870	550349	4163619.51
1871	550729	4163619.51	RES	3.45E-03	2.27E-03	1.19E-06	2.37E-06	4.69E-08	4.66E-07	5.1E-07	0.512711925	6.90E-04	1871	550729	4163619.51
1872	550869	4163619.51	RES	5.00E-04	4.70E-04	1.73E-07	4.91E-07	6.80E-09	9.64E-08	1.0E-07	0.103241647	1.00E-04	1872	550869	4163619.51
1873	550889	4163619.51	RES	4.40E-04	4.20E-04	1.52E-07	4.39E-07	5.98E-09	8.62E-08	9.2E-08	0.092165902	8.80E-05	1873	550889	4163619.51
1874	550929	4163619.51	RES	3.40E-04	3.40E-04	1.18E-07	3.55E-07	4.62E-09	6.98E-08	7.4E-08	0.074390312	6.80E-05	1874	550929	4163619.51
1875	550949	4163619.51	RES	3.10E-04	3.20E-04	1.07E-07	3.34E-07	4.22E-09	6.57E-08	7.0E-08	0.069878419	6.40E-05	1875	550949	4163619.51
1876	550969	4163619.51	RES	2.80E-04	2.90E-04	9.69E-08	3.03E-07	3.81E-09	5.95E-08	6.3E-08	0.063314567	5.80E-05	1876	550969	4163619.51
1877	551009	4163619.51	RES	2.40E-04	2.50E-04	8.31E-08	2.61E-07	3.26E-09	5.13E-08	5.5E-08	0.054562766	5.00E-05	1877	551009	4163619.51
1878	551029	4163619.51	RES	2.20E-04	2.40E-04	7.62E-08	2.51E-07	2.99E-09	4.92E-08	5.2E-08	0.052238822	4.80E-05	1878	551029	4163619.51
1879	551049	4163619.51	RES	2.10E-04	2.20E-04	7.27E-08	2.30E-07	2.86E-09	4.51E-08	4.8E-08	0.047998915	4.40E-05	1879	551049	4163619.51
1880	551069	4163619.51	RES	1.90E-04	2.10E-04	6.58E-08	2.19E-07	2.58E-09	4.31E-08	4.6E-08	0.045674971	4.20E-05	1880	551069	4163619.51
1881	551089	4163619.51	RES	1.80E-04	2.00E-04	6.23E-08	2.09E-07	2.45E-09	4.10E-08	4.3E-08	0.043487021	4.00E-05	1881	551089	4163619.51
1882	551109	4163619.51	RES	1.70E-04	1.90E-04	5.88E-08	1.99E-07	2.31E-09	3.90E-08	4.1E-08	0.041299071	3.80E-05	1882	551109	4163619.51
1883	549909	4163639.51	RES	1.80E-04	2.30E-04	6.23E-08	2.40E-07	2.45E-09	4.72E-08	5.0E-08	0.049642893	4.60E-05	1883	549909	4163639.51
1884	549929	4163639.51	RES	1.80E-04	2.30E-04	6.23E-08	2.40E-07	2.45E-09	4.72E-08	5.0E-08	0.049642893	4.60E-05	1884	549929	4163639.51
1885	549949	4163639.51	RES	1.90E-04	2.40E-04	6.58E-08	2.51E-07	2.58E-09	4.92E-08	5.2E-08	0.051830843	4.80E-05	1885	549949	4163639.51
1886	549969	4163639.51	RES	1.90E-04	2.40E-04	6.58E-08	2.51E-07	2.58E-09	4.92E-08	5.2E-08	0.051830843	4.80E-05	1886	549969	4163639.51
1887	549989	4163639.51	RES	2.00E-04	2.50E-04	6.92E-08	2.61E-07	2.72E-09	5.13E-08	5.4E-08	0.054018793	5.00E-05	1887	549989	4163639.51
1888	550009	4163639.51	RES	2.10E-04	2.50E-04	7.27E-08	2.61E-07	2.86E-09	5.13E-08	5.4E-08	0.054154787	5.00E-05	1888	550009	4163639.51
1889	550029	4163639.51	RES	2.10E-04	2.60E-04	7.27E-08	2.72E-07	2.86E-09	5.34E-08	5.6E-08	0.056206744	5.20E-05	1889	550029	4163639.51
1890	550049	4163639.51	RES	2.20E-04	2.70E-04	7.62E-08	2.82E-07	2.99E-09	5.54E-08	5.8E-08	0.058394694	5.40E-05	1890	550049	4163639.51
1891	550069	4163639.51	RES	2.30E-04	2.70E-04	7.96E-08	2.82E-07	3.13E-09	5.54E-08	5.9E-08	0.058530687	5.40E-05	1891	550069	4163639.51
1892	550089	4163639.51	RES	2.50E-04	2.80E-04	8.65E-08	2.93E-07	3.40E-09	5.75E-08	6.1E-08	0.060854631	5.60E-05	1892	550089	4163639.51
1893	550129	4163639.51	RES	3.40E-04	3.30E-04	1.18E-07	3.45E-07	4.62E-09	6.77E-08	7.2E-08	0.072338355	6.80E-05	1893	550129	4163639.51
1894	550149	4163639.51	RES	5.00E-04	4.30E-04	1.73E-07	4.49E-07	6.80E-09	8.82E-08	9.5E-08	0.095033818	1.00E-04	1894	550149	4163639.51
1895	550169	4163639.51	RES	3.00E-04	3.10E-04	1.04E-07	3.24E-07	4.08E-09	6.36E-08	6.8E-08	0.067690468	6.20E-05	1895	550169	4163639.51
1896	550189	4163639.51	RES	3.30E-04	3.30E-04	1.14E-07	3.45E-07	4.49E-09	6.77E-08	7.2E-08	0.072202362	6.60E-05	1896	550189	4163639.51
1897	550209	4163639.51	RES	5.00E-04	4.30E-04	1.73E-07	4.49E-07	6.80E-09	8.82E-08	9.5E-08	0.095033818	1.00E-04	1897	550209	4163639.51
1898	550269	4163639.51	RES	3.80E-04	3.60E-04	1.32E-07	3.76E-07	5.17E-09	7.39E-08	7.9E-08	0.079038199	7.60E-05	1898	550269	4163639.51
1899	550289	4163639.51	RES	3.80E-04	3.60E-04	1.32E-07	3.76E-07	5.17E-09	7.39E-08	7.9E-08	0.079038199	7.60E-05	1899	550289	4163639.51
1900	550309	4163639.51	RES	3.90E-04	3.70E-04	1.35E-07	3.87E-07	5.30E-09	7.59E-08	8.1E-08	0.08122615	7.80E-05	1900	550309	4163639.51
1901	550329	4163639.51	RES	4.10E-04	3.80E-04	1.42E-07	3.97E-07	5.58E-09	7.80E-08	8.4E-08	0.083550093	8.20E-05	1901	550329	4163639.51
1902	550349	4163639.51	RES	4.30E-04	4.00E-04	1.49E-07	4.18E-07	5.85E-09	8.21E-08	8.8E-08	0.087925994	8.60E-05	1902	550349	4163639.51
1903	550369	4163639.51	RES	4.50E-04	4.20E-04	1.56E-07	4.39E-07	6.12E-09	8.62E-08	9.2E-08	0.092301895	9.00E-05	1903	550369	4163639.51
1904	550849	4163639.51	RES	5.10E-04	4.80E-04	1.77E-07	5.02E-07	6.94E-09	9.85E-08	1.1E-07	0.105429597	1.02E-04	1904	550849	4163639.51
1905	550869	4163639.51	RES	4.40E-04	4.30E-04	1.52E-07	4.49E-07	5.98E-09	8.82E-08	9.4E-08	0.094217859	8.80E-05	1905	550869	4163639.51
1906	550889	4163639.51	RES	3.90E-04	3.90E-04	1.35E-07	4.08E-07	5.30E-09	8.00E-08	8.5E-08	0.085330064	7.80E-05	1906	550889	4163639.51
1907	550909	4163639.51	RES	3.50E-04	3.50E-04	1.21E-07	3.66E-07	4.76E-09	7.18E-08	7.7E-08	0.076578263	7.00E-05	1907	550909	4163639.51
1908	550929	4163639.51	RES	3.10E-04	3.20E-04	1.07E-07	3.34E-07	4.22E-09	6.57E-08	7.0E-08	0.069878419	6.40E-05	1908	550929	4163639.51
1909	550969	4163639.51	RES	2.60E-04	2.70E-04	9.00E-08	2.82E-07	3.54E-09	5.54E-08	5.9E-08	0.058938667	5.40E-05	1909	550969	4163639.51
1910	550989	4163639.51	RES	2.40E-04	2.60E-04	8.31E-08	2.72E-07	3.26E-09	5.34E-08	5.7E-08	0.056614723	5.20E-05	1910	550989	4163639.51
1911	551009	4163639.51	RES	2.20E-04	2.40E-04	7.62E-08	2.51E-07	2.99E-09	4.92E-08	5.2E-08	0.052238822	4.80E-05	1911	551009	4163639.51
1912	551029	4163639.51	RES	2.10E-04	2.30E-04	7.27E-08	2.40E-07	2.86E-09	4.72E-08	5.0E-08	0.050050872	4.60E-05	1912	551029	4163639.51
1913	551049	4163639.51	RES	1.90E-04	2.10E-04	6.58E-08	2.19E-07	2.58E-09	4.31E-08	4.6E-08	0.045674971	4.20E-05	1913	551049	4163639.51

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Appendix C

Biological Resources

LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

May 9, 2022

Richard Norris
SummerHill Homes
777 S. California Avenue
Palo Alto, CA 94304

SUBJECT: Biological resources assessment of 300 Piedmont Avenue in the City of San Bruno, CA (PN 2689-01)

Dear Mr. Norris:

At your request, Live Oak Associates, Inc. (LOA), completed an analysis of potential biological constraints for the approximately 40.4-acre site located at 300 Piedmont Avenue in the City of San Bruno, San Mateo County, California. The site is the location of the former Crestmoor High School, but the school is no longer operational. Turf fields of the site are still maintained for local recreational sports. It is our understanding that the site is being considered for redevelopment as residential housing.

The primary objectives of this report are to: 1) identify habitats onsite, 2) discuss the suitability of the site to support habitat for special-status plant or animal species, 3) identify and discuss biological resource issues specific to the site that could constrain future development, and 4) identify potential avoidance and mitigation options that could significantly reduce the magnitude of any likely impacts to biological resources associated with future site development.

METHODS

LOA conducted a background review to identify special status species that occur within the region of the site. Sources of information used in the preparation of this analysis include, but are not limited to, the *California Natural Diversity Database* (CDFW 2022; "CNDDB"), special status species lists prepared by the California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS), a web soil survey obtained via the National Resource Conservation Service (NRCS 2022), and manuals and references related to plants and animals found in and around San Mateo County.

LOA ecologists Nathan Hale and Cristal Romero conducted a site survey on April 14, 2022. The majority of the site was inspected, including the entire project footprint, based on conceptual planning described by SummerHill Homes's Sam Rosen. However, some of the eastern slope of the wooded habitat was inaccessible for LOA due to locked gates. It is our understanding that the only work in that portion of the property (i.e., the eastern forested slope) would be some vegetation removal work (e.g., removal of dead tree snags) to reduce wildfire risk.

EXISTING CONDITIONS

Site Location and Regional Setting

The site is located at 300 Piedmont Avenue in the City of San Bruno, San Mateo County, California (Attachment 1: Figure 1). The property is surrounded by residential development to the north, west, and south, and Interstate 280 to the east, and it occurs to the northeast of the northernmost portion of the Santa Cruz Mountains. San Andreas Lake occurs approximately 0.4 miles to the west. The project site is in the Montara Mountain 7.5" U.S. Geological Survey (USGS) quadrangle in the east half of section 5 of township 4 south, range 5 west, based on the Mt. Diablo Meridian.

Soils

Six soil types occur on-site: Candlestick-Kron-Buriburi complex, 30 to 75 percent slopes; Orthents, cut and fill, 0 to 15 percent slopes; Orthents, cut and fill, 15 to 75 percent slopes; Orthents, cut and fill-Urban land complex, 5 to 75 percent slopes; Urban land; Urban land-Orthents, cut and fill complex, 5 to 75 percent slopes (NRCS 2022). All of these are well drained soils derived from weathered sandstone. None are considered hydric, serpentine, or alkaline. As such, none of the soil types mapped as occurring onsite are suspected of supporting edaphic special status plant species. The majority of the site's soils have been manipulated during the past development of the school and associated roadway.

Land Covers

Three land cover types were identified on the site. For the purposes of this report, they are classified as developed/school grounds, mixed pine eucalyptus forest, and ruderal grassland. These are described below. A list of vascular plant species observed on the site is included as Attachment 2.

Developed/Schoolgrounds. The site is primarily comprised of existing development in the form of unused high school buildings with intervening walkways and gathering spaces, roadways, parking areas, turf grass fields, maintenance yards, and various sheds and storage facilities. All outdoor areas of the schoolgrounds, except for the inner courtyards (encircled by locked buildings), were surveyed. Several mature landscape trees were present in this portion of the site, including Monterey pine, atlas cedar, London plane trees (*Platanus ×hispanica*), and other, unspecified tree species. Ruderal plants, including non-native grasses and forbs, and some landscaping plants were also present. Species noted include belladonna lily (*Amaryllis belladonna*), slender wild oak (*Avena barbata*), rip-gut brome (*Bromus diandrus*), soft chess (*B. hordeaceus*), Italian thistle (*Carduus pycnocephalus*), sea fig ice plant (*Carpobrotus edulis*), cotoneaster (*Cotoneaster* sp.), filaree (*Erodium* sp.), fennel (*Foeniculum vulgare*), fumatory (*Fumaria* sp.), and common groundsel (*Senecio vulgare*).

Animal species using the mixed pine eucalyptus woodland habitat would be expected to utilize developed lands of the site for occasional foraging and dispersal, though these areas are generally considered lower value habitat for regional wildlife. Some onsite structures could be utilized as roosting and/or nesting habitat by some bird and bat species. Animals observed specifically using the schoolgrounds include European starling (*Sturnus vulgaris*), black phoebe (*Sayornis nigricans*), Eurasian collared dove (*Streptopelia decaocto*), house finch (*Haemorhous*

mexicanus), American crow (*Corvus brachyrhynchos*), and common raven (*Corvus corax*). Turkey vultures (*Cathartes aura*) soaring above the grounds were also observed. Evidence of Botta's pocket gopher (*Thomomys bottae*) was also found in the athletic fields and lawns.

Mixed Pine Eucalyptus Forest. Approximately 25% of the property consists of a forested habitat dominated by Monterey pine (*Pinus radiata*) and red gum (*Eucalyptus camaldulensis*) trees. This habitat is semi-natural but includes a large contingent of naturalized ornamental species and other non-native plants. The habitat area generally wraps around the northern and western margins of the site with a small portion on the southern edge of the site and another patch on the western edge of the site. Most of this habitat occurs within slopes of the site. Other than the Monterey pines and red gums, subdominant tree species included coast live oak (*Quercus agrifolia*), holly oak (*Quercus ilex*), and atlas cedar (*Cedrus atlantica*). A dense shrub layer was also present in parts of this habitat consisting of French broom (*Genista monspessulana*), poison oak (*Toxicodendron diversilobum*), manzanita (*Arctostaphylos* sp.), California blackberry (*Rubus ursinus*), and toyon (*Heteromeles arbutifolia*). Various herbaceous plants were also noted, including miner's lettuce (*Claytonia parviflora*), English ivy (*Hedera helix*), Douglas iris (*Iris douglasiana*), man root (*Marah* sp.), wood sorrel (*Oxalis* sp.), pampas grass (*Cortaderia* sp.), snake root (*Sanicula* sp.), and clovers (*Trifolium* sp.).

Birds observed either specifically within or soaring above this habitat included the red-tailed hawk (*Buteo jamaicensis*), California scrub-jay (*Aphelocoma californica*), Anna's hummingbird (*Calypte anna*), pygmy nuthatch (*Sitta pygmaea*), California towhee (*Melozone crissalis*), wrentit (*Chamaea fasciata*), golden crowned sparrow (*Zonotrichia atricapilla*), chestnut-backed chickadee (*Poecile rufescens*), Bewick's wren (*Thryomanes bewickii)*, dark-eyed junco (*Junco hyemalis*), and cedar waxwing (*Bombycilla cedrorum*). The tree canopy as well as the understory plants provide abundant forage and nesting habitat for these avian species.

San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) nests were found at the base of trees along the chain-link fence on the eastern border of the project and in the densely wooded sloped area on the western and eastern sides of the project site. A few small mammal burrows were also noted within the wooded areas of the site. Given the site's location within urbanized lands, typical urban mammals such as raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), and feral and domestic cats (*Felis catus*) and dogs (*Canis lupus familiaris*) would be expected to occur onsite. The proximity to the Santa Cruz mountains may enable species such as the western grey squirrel (*Sciurus griseus*), striped skunk (*Mephitis mephitis*), and bobcat (*Lynx rufus*) to access the site from time to time.

Ruderal grassland. A few small areas of ruderal grassland were present on the site, most notably at the southern tip and just west of the main campus parking lot. These areas are generally located in the margin between the site's forested and developed areas. The grassland area within the southern tip of the site may have been maintained as a fire break between the residential properties to the south and the campus. In general, the ruderal grasslands occurring onsite have been subjected to site management (e.g., mowing and mulch storage) and prior development impacts. Grasses and forbs observed in these areas include wild oats, ripgut

brome, soft chess, Italian thistle, bristly ox-tongue, filaree, foxtail barley (*Hordeum murinum* ssp. *leporinum*), lupine (*Lupinus* sp.), spring vetch (*Vicia sativa*), and hairy vetch (*V. villosa*).

Animals observed in the developed and forested areas of the site would also be expected to forage in or disperse through the ruderal grasslands. Grasslands found onsite could provide foraging habitat, though the historic disturbances and limited size of the grassland make nesting habitat marginal at best.

Special Status Species

A 6-quad search of published accounts for all relevant special status plant and animal species was conducted for the Montara Mountain USGS 7.5" quadrangle in which the project site occurs and for the five surrounding quadrangles (Half Moon Bay, San Francisco South, Hunters Point, San Mateo, and Woodside) using the California Natural Diversity Data Base (CNDDB) Rarefind (CDFW 2022). There are no terrestrial quadrangles to the west of the project since the quadrangles of the site are bound by the Pacific Ocean. Several special status plants and animals occur in the vicinity of the study area (Attachment 1: Figures 1a & 1b).

LOA analyzed all special status species that came up in the six-quad CNDDB search for their potential to occur on the site. Except for the two species discussed below, only species that were determined to have a reasonable potential to occur on the site are discussed further in this letter.

Special status plants. Special status plant species considered absent or unlikely to occur were determined based on one or more of the following: 1) suitable habitats (e.g., marshes, coastal dunes, redwood forests, and chaparral) or suitable soils (e.g., serpentine, rocky, alkaline, and mesic soils) are absent from the site, 2) the species are only known to occur at elevations well above or below that of the site, 3) the site occurs outside the known range of the species, or 4) the species are known from only limited locations that are too far from the site to reasonably anticipate that they could colonize the site.

Two special status plant species—Franciscan onion (*Allium peninsulare* var. *franciscanum*) and Point Reyes horkelia (*Horkelia marinensis*)—warrant additional discussion because the site falls within the precision radius of nearby occurrences of these species (Figure 1a in Attachment 1). Franciscan onion would not be expected to occur on the site because the site lacks suitable soils for this species, and the grasslands of the site are ruderal and limited in size. Point Reyes horkelia was documented as occurring less than one mile from the site in 1962. This species occurs in coastal prairie, coastal dune, or coastal scrub habitats, which are absent from the site; therefore, this species would not occur on the site.

Special status animals. Special status animal species that are known or were once known to occur regionally and were determined to be absent or unlikely to occur within the site based on the lack of suitable habitats (e.g., coastal bluff, riparian forests, chapparal, ponds, and streams) and/or because the site is isolated from suitable habitat for these species have also been excluded from the following discussion.

Species that may pose constraints to the proposed project are included in the discussion below.

Jurisdictional Waters

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and that, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), and the California Regional Water Quality Control Board (RWQCB).

No areas meeting the regulatory definition of jurisdictional waters, including wetlands, were observed within the proposed development envelope or elsewhere on the site. Although a portion of the forested slopes in the western part of the site was inaccessible during the April 2022 survey, this area was undifferentiated in both vegetative composition and slope from accessible areas; therefore, it is presumed that this area does not include wetlands.

BIOLOGICAL CONSTRAINTS

Special Status Plants

Of the 64 special status plant species that are known to occur regionally (CDFW 2022), four plant species have the potential to occur on the site. These species include the Anderson's manzanita (*Arctostaphylos andersonii*), Montara manzanita (*Arctostaphylos montaraensis*), western leatherwood (*Dirca occidentalis*), and San Mateo woolly sunflower (*Eriophyllum latilobum*), all of which are known to only occur in wooded habitats. Therefore, the grasslands and developed areas of the site would not support these species. Manzanita shrubs were observed in a wooded portion of the site along the southeastern margin of the site, to the east of Courtland Drive, behind extant chain link fencing from the roadway but could not be identified to species during the April 2022 survey.

It is our understanding that project disturbances within the forested portions of the site will be limited to the clearing of dead trees for fire risk reduction and replacement of the existing chain-link fence. To ensure these and other as-of-yet unplanned project elements within the woodlands of the site do not result in avoidable significant impacts to any special status plant species, focused surveys for these species are recommended early in the planning phase of the project. If such plants occur within or immediately adjacent to the planned disturbance footprint of the project, and if populations that would be impacted are determined to be significant, mitigation strategies may be available to offset impacts to plant populations. Such strategies may include relocation of individual manzanita or western leatherwood shrubs, restoration of populations of plants, and/or preservation of intact populations of these species in perpetuity.

For planning purposes, the San Mateo woolly sunflower can typically be surveyed for in May and June, when the species is blooming (based on reference populations). The remaining three plants, all of which are perennial shrubs, can be identified throughout the year by highly qualified botanists.

Special Status Wildlife, Migratory Birds, and Bats

Special status wildlife species are those that have been listed as endangered or threatened either federally or by the State; it also includes animals that have been designated as "species of special concern" or "fully protected" by the California Department of Fish and Wildlife. Twenty-one special status animals are known to occur in the region and were evaluated as part of this analysis. Most would not constrain future project buildout because the habitats onsite are not suitable for them or the site is located outside of the species' known range. Only one special status wildlife species, the San Francisco dusky-footed woodrat, a California species of special concern (CDFW 2022), is presumed present on the site; while individuals were not seen, woodrat stick nests and fresh scat were observed in the woodlands during the April 2022 site visit. Special status bats, incluidng Townsend's big-eared bat (*Corynorhinus townsendii*), big free-tailed bat (*Nyctinomops macrotis*) and pallid bat (*Antrozous pallidus*), and protected nesting migratory birds may also use the site for breeding or foraging.

Special status bats and nesting migratory birds may nest in or among vegetation and buildings on the site. Since most of the site has already been developed, the redevelopment of the site into housing would result in only a slight decrease in potential foraging and breeding habitat for these species regionally. Therefore, impacts to habitat for these species would not be considered regionally significant nor would they require habitat mitigation; however, impacts to individual bats or active bird nests would be considered significant. Avoidance measures to ensure such impacts to individuals do not occur would be warranted. These measures are described further below.

San Francisco Dusky-Footed Woodrat. The San Francisco dusky-footed woodrat is a California species of special concern whose presence onsite was confirmed during the April 2022 site visit. The presence of San Francisco dusky-footed woodrat nests poses a low level of constraint to development in the vicinity of the nests. Any construction activity that results in harm or mortality to this species, or in nest abandonment, may be considered a significant impact under CEQA and a violation of state law.

Prior to project implementation, a qualified biologist should conduct a preconstruction survey for San Francisco dusky-footed woodrat nests within and adjacent to the project footprint no more than 30 days prior to the onset of construction activities. This survey timing allows for the scheduling of and relocation of woodrat nests, if necessary. The survey should encompass all construction zones and surrounding lands within 50 feet of these zones.

All identified nests should be avoided, where possible. It is expected that avoidance of all or most of the nests should be feasible, as most of the area where construction would occur is already developed and is unsuitable habitat for nest development. Woodrat nests that occur within 50 feet of the project work area should have a physical buffer established around them demarcated by flagging, exclusion fencing, or other suitable materials. If avoidance of a nest is not possible, the nest(s) would need to be manually relocated when young are not present using the following methods.

- To safely dismantle a nest, the dismantling process should occur in October through December under the direction of a qualified biologist. If this timing is not feasible or compatible with the timing of construction, the biologist could dismantle the nest at a different time, but if baby woodrats (i.e., pups) are exposed during the process, the nest would need to be re-built over the pups, and the nest should be buffered for approximately 3 weeks before dismantling can recommence. To start dismantling, a landscape crew or other qualified crew would be present onsite with the qualified biologist to clear vegetation for the qualified biologist to access the nest(s). All persons involved in the removal of materials (biologist and landscape crew) should wear a respirator, long sleeves, and gloves during the disassembling and removal process to reduce the potential for exposure to hantavirus, rotavirus, and other diseases that woodrat nests may contain. Two to three temporary shelters such as an upside-down half-wine barrel or wooden box with rodent-sized opening shall be placed near the nest to be disassembled to provide any evicted woodrats a safe cover (refugia). Deconstruction of the nest will be conducted by the biologist on the opposite side of the nest as the temporary refugia so that woodrats have a direct path to the refugia.
- Disassembling work is to be conducted by a qualified biologist in afternoon/evening hours to the extent practicable to limit stress to any evicted woodrats. Deconstructed nest material will be placed on a tarp to either dispose of it or to use it to rebuild a nest with the same material in a different location. Materials on the tarp should include structural, nesting chamber, and stored food. Relocation of nests should be built as close as possible with a center chamber at the bottom with nesting material and food stores with sticks forming a chamber above this. If forming a nest chamber is difficult given the material of the original nest, additional sticks from the surrounding areas can be used or a wooden box with a hole cut for the entrance can be used.

Nesting Raptors and Migratory Birds. Trees, shrubs, and buildings occurring on and adjacent to the site could be used by raptors and other migratory birds for nesting. All nesting raptors and migratory birds, regardless of their status, are protected by state and federal laws. Therefore, project-related activities that adversely affect the nesting success of raptors and migratory birds (i.e., lead to the abandonment of active nests) or result in mortality of individual birds constitute a violation of state and federal laws. Project-related activities that occur during the breeding season could be constrained in the vicinity of any active nests. If tree removal or ground disturbance activities are scheduled to commence during the breeding season (February 1 through August 31), pre-construction nesting bird surveys should be conducted by a qualified biologist to identify possible nesting activity. A construction-free buffer of suitable dimensions must be established around any active raptor and migratory bird nests (up to 250 feet, depending on the location and species) for the duration of the project or until it has been determined that the chicks have fledged and are independent of their parents.

Bats. No evidence of bats was observed during the April 2022 site visit; however, we cannot fully discount the presence of bats inside the onsite buildings or within tree cavities within the forested portions of the site. It is also possible the wooded area has larger trees with cavities that could also serve as roosting habitat for locally occurring bat species. Special status bats

known to occur in the region include Townsend's big-eared bat (*Corynorhinus townsendii*), big free-tailed bat (*Nyctinomops macrotis*) and pallid bat (*Antrozous pallidus*). In addition to roosting, bats are likely to forage on and around the project site at night.

A pre-construction survey for roosting bats is recommended within the project footprint and within a 50-foot buffer of the project footprint. If a non-breeding or non-wintering bat colony is found, the individuals should be humanely evicted via the partial dismantlement (two-step removal) of the trees or buildings prior to removal under the direction of a qualified biologist to ensure that no harm or take would occur to any bats as a result of removal activities. If a maternity colony or overwintering colony is detected in the trees or buildings of the site, then a construction-free buffer should be established around the tree(s) and remain in place until it has been determined that the nursery or overwintering colony is no longer active.

Trees

Several trees of the site qualify as protected heritage trees by the City of San Bruno and will require removal to accommodate future buildout of the project site. Tree removal and preservation should occur pursuant to the City of San Bruno's tree ordinance (Attachment 3). This will require a tree removal permit for removal of heritage trees. Replacement of removed trees would be required as part of project conditions. The number and size of replacement trees would be determined by the city's director of public works. If replacement trees cannot be accommodated, payment into the city's tree planting fund may be available.

Jurisdictional Waters and Wetlands

Jurisdictional waters, including wetlands, are not present in the proposed development footprint or on the forested slopes where fire risk reduction clearing work is not anticipated. Therefore, project buildout would not be constrained by the presence of wetlands or other jurisdictional waters.

CONCLUSION

In summary, future development of the site could be minimally to moderately constrained by the presence of special status plant species, San Francisco dusky footed woodrats, nesting migratory birds, and roosting bats. Focused surveys for special status plant species will need to be conducted to confirm the presence or absence of four species that could occur within the woodlands of the site. If such plants occur within the project disturbance footprint, including areas that may need to be managed to reduce fire risk, avoidance planning and/or mitigation may be required and could include relocation, restoration, and/or preservation of known populations of the impacted plants.

Future site development could be minimally constrained by the presence of nesting birds, bats, and San Francisco dusky footed woodrats, potentially resulting in project timing delays and relatively inexpensive avoidance measures. Focused preconstruction surveys would need to be completed for nesting birds, bats, and San Francisco dusky footed woodrats to determine the extent to which these species occur within the project construction envelope. If active San

Francisco dusky footed woodrat nests occur within the project footprint, reasonable measures are available that can be taken to relocate nests in the project impact footprint into non-impacted wooded areas of the site. If active bird nests are identified, the nests would need to be protected by a disturbance-free buffer until the nest is no longer active, after which the buffer could be removed, and project activities could commence. If active bat colonies are identified, a temporary buffer would be required if the colony is determined to be an active nursery colony; otherwise, a two-step passive relocation technique could be employed to encourage the bats to self-relocate.

Tree impacts, including tree removal, could constrain development, and any removal of trees should occur in compliance with the municipal tree policy. Depending on which trees are to be impacted, this may include replacement of trees or payment of in-lieu fees for removed trees.

If you have any questions regarding our conclusions please contact me at nhale@loainc.com or (408) 888-7271 or Davinna Ohlson at dohlson@loainc.com or (408) 658-8339 at your earliest convenience.

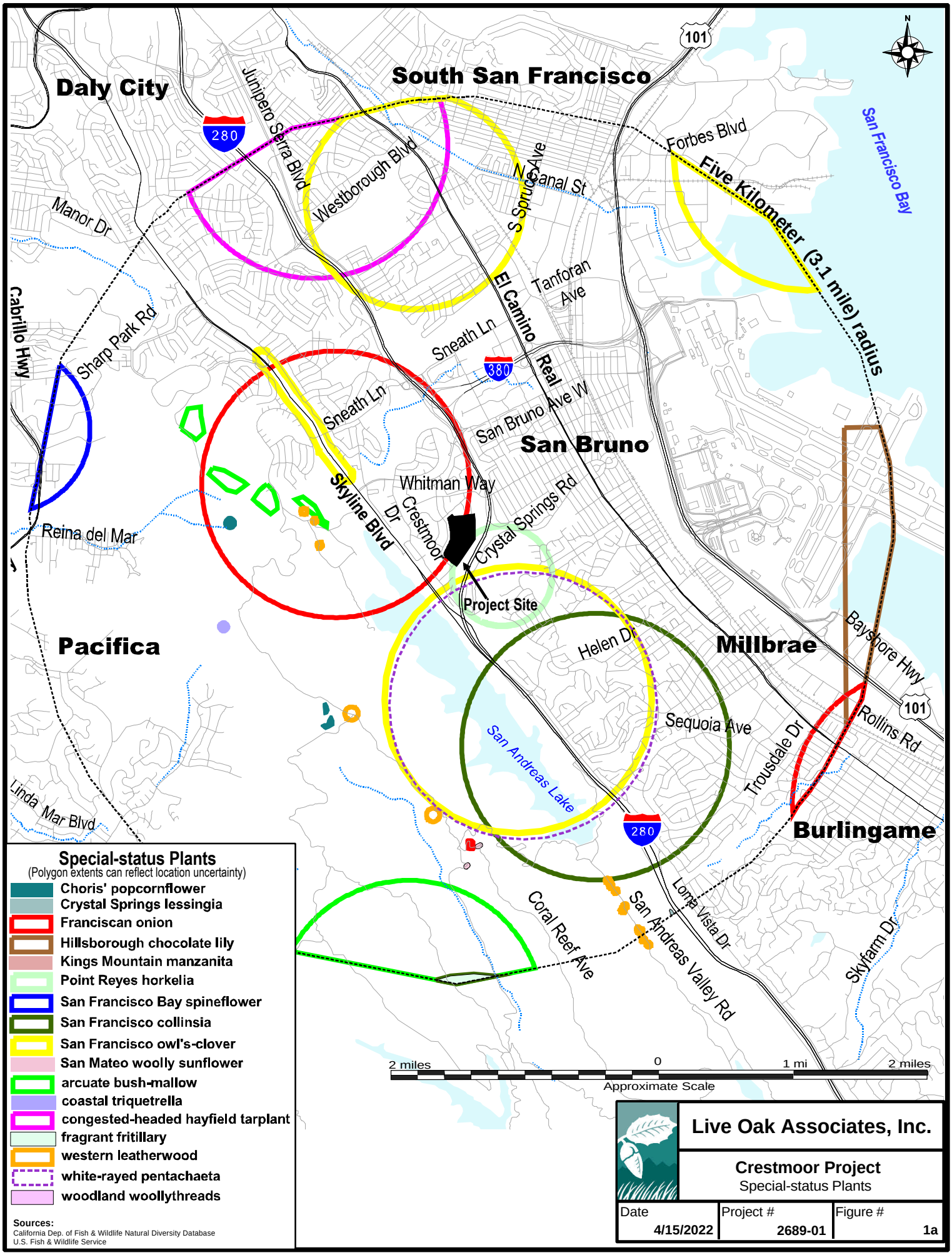
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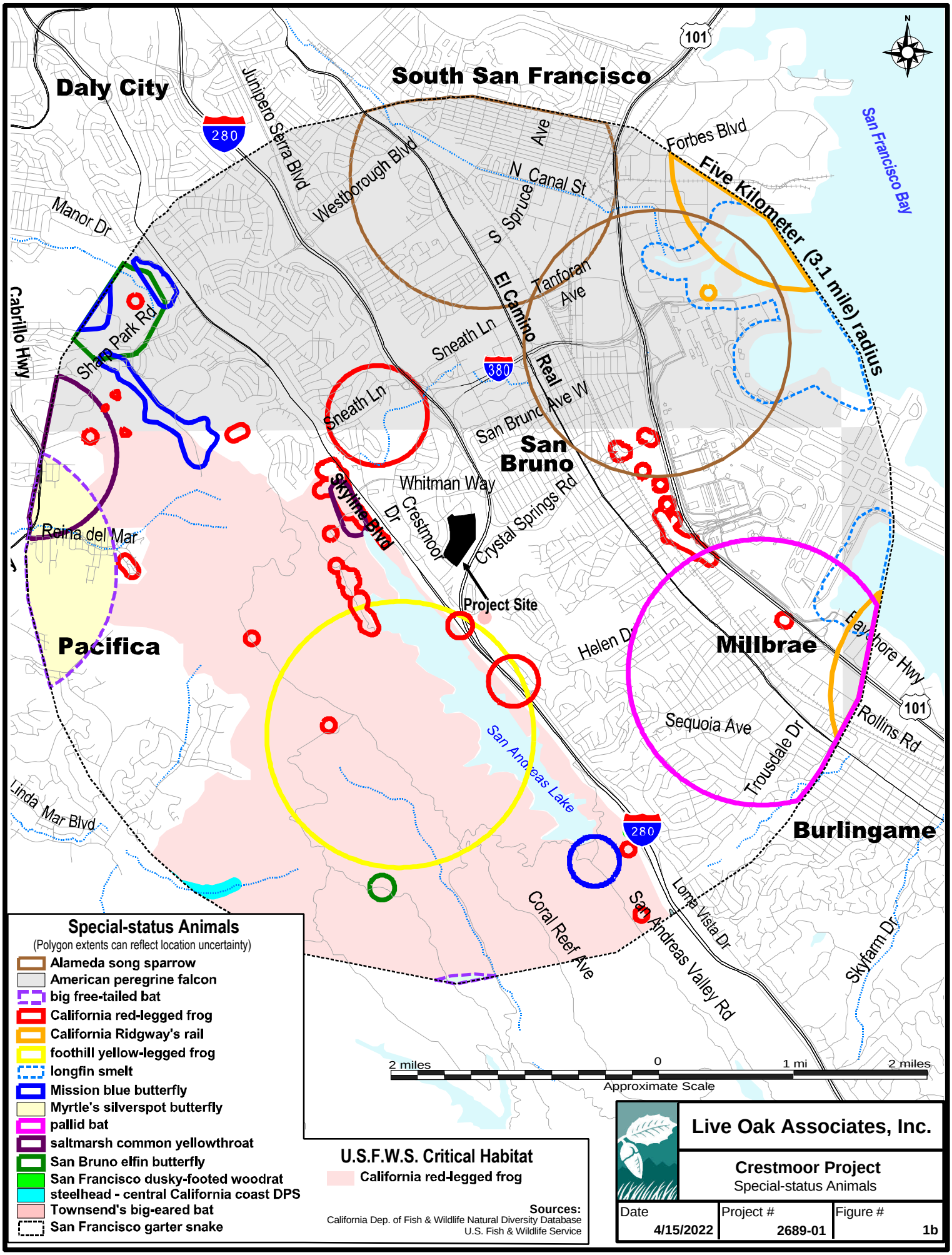


Nathan Hale
Senior Project Manager
Staff Ecologist

Enclosures

Attachment 1. Special Status Species Figures 1a and 1b


Daly City
South San Francisco
San Bruno
Pacifica
Millbrae
Burlingame
101
280
380
Junipero Serra Blvd
Westborough Blvd
S Spruce Ave
N Canal St
Forbes Blvd
Five Kilometer (3.1 mile) radius
San Francisco Bay
Manor Dr
Cabrillo Hwy
Sharp Park Rd
El Camino Real
Tanforan Ave
Sneath Ln
San Bruno Ave W
Skyline Blvd
Whitman Way
Crestmoor Dr
Crystal Springs Rd
Project Site
Reina del Mar
Helen Dr
Sequoia Ave
San Andreas Lake
Bayshore Hwy
Rollins Rd
Trousdale Dr
Linda Mar Blvd
Coral Reef Ave
San Andreas Valley Rd
Loma Vista Dr
Skyfarm Dr
2 miles
0
1 mi
2 miles
Approximate Scale
Special-status Plants
(Polygon extents can reflect location uncertainty)
Choris' popcornflower
Crystal Springs lessingia
Franciscan onion
Hillsborough chocolate lily
Kings Mountain manzanita
Point Reyes horkelia
San Francisco Bay spineflower
San Francisco collinsia
San Francisco owl's-clover
San Mateo woolly sunflower
arcuate bush-mallow
coastal triquetrella
congested-headed hayfield tarplant
fragrant fritillary
western leatherwood
white-rayed pentachaeta
woodland woollythreads
Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
Live Oak Associates, Inc.
Crestmoor Project
Special-status Plants
Date
4/15/2022
Project #
2689-01
Figure #
1a


Daly City
South San Francisco
San Bruno
Pacifica
Millbrae
Burlingame
Project Site
Five Kilometer (3.1 mile) radius
Special-status Animals
(Polygon extents can reflect location uncertainty)
Alameda song sparrow
American peregrine falcon
big free-tailed bat
California red-legged frog
California Ridgway's rail
foothill yellow-legged frog
longfin smelt
Mission blue butterfly
Myrtle's silverspot butterfly
pallid bat
saltmarsh common yellowthroat
San Bruno elfin butterfly
San Francisco dusky-footed woodrat
steelhead - central California coast DPS
Townsend's big-eared bat
San Francisco garter snake
U.S.F.W.S. Critical Habitat
California red-legged frog
Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
2 miles 0 1 mi 2 miles
Approximate Scale
Live Oak Associates, Inc.
Crestmoor Project
Special-status Animals
Date 4/15/2022
Project # 2689-01
Figure # 1b

Attachment 2. Vascular Plants observed at 300 Piedmont Avenue, San Bruno, California (April 14, 2022).

Scientific name	Family	Common Name	Wetland Indicator Status
Agapanthus sp.*	Agapanthoideae	lily of the Nile	NI
*Amaryllis belladonna**	Amaryllidaceae	belladonna lily	UPL
Arbutus menziesii	Ericaceae	Madrone	UPL
Arctostaphylos sp.	Ericaceae	manzanita	NI
*Avena barbata**	Poaceae	slender wild oat	UPL
Allium sp.	Alliaceae	onion	NI
*Bromus diandrus**	Poaceae	ripgut brome	UPL
*Bromus hordeaceus**	Poaceae	soft chess	FACU-
*Carduus pycnocephalus**	Asteraceae	Italian thistle	UPL
*Carpobrotus edulis**	Aizoaceae	sea fig	UPL
Ceanothus thyrsiflorus	Rhamnaceae	blueblossom	UPL
Cedrus atlantica	Cupressaceae	Atlas cedar	UPL
Claytonia parviflora	Montiaceae	miner's lettuce	FACU
Cortaderia sp.*	Poaceae	pampas grass	NI
*Cotoneaster lacteus**	Euphorbiaceae	milkflower cotoneaster	NI
*Epipactis helleborine**	Orchidaceae	broadleaf helleborine	FACU
*Erodium moschatum**	Geraniaceae	broad-leaved filaree	UPL
*Eucalyptus camaldelensis**	Myrtaceae	red gum	FAC
Festuca microstachys	Poaceae	small fescue	FAC
*Foeniculum vulgare**	Apiaceae	sweet fennel	UPL
Fumaria sp.*	Papaveraceae	fumatory	UPL
*Genista monspessulana**	Fabaceae	French broom	UPL
*Geranium dissectum**	Geraniaceae	Cranesbill	UPL
*Hedera helix**	Araliaceae	English ivy	FACU
*Helminthotheca echioides**	Asteraceae	Bristly ox-tongue	FAC
Heteromeles arbutifolia	Rosaceae	toyon	UPL
*Hirschfeldia incana**	Brassicaceae	summer mustard	UPL
*Hordeum murinum ssp. leporinum**	Poaceae	barnyard foxtail, foxtail barley	NI
Iris douglasiana	Iridaceae	Douglas iris	UPL
Lonicera hispidula	Caprifoliaceae	pink honeysuckle	FACU
Lupinus sp.	Fabaceae	lupin	NI
Malva parviflora	Malvaceae	cheeseweed	UPL
Marah sp.	Cucurbitaceae	manroot	NI
Matricaria discoidea	Asteraceae	pineapple weed	FACU
*Medicago polymorpha**	Fabaceae	burclover	UPL
*Medicago lupulina**	Fabaceae	black medick	FAC
*Nerium oleander**	Apocynaceae	white oleander	UPL
Oxalis sp.	Oxalidaceae	wood sorrel	NI
Pelargonium sp.*	Geraniaceae	geranium	NI

Scientific name	Family	Common Name	Wetland Indicator Status
Pinus radiata	Pinaceae	Monterey pine	UPL
*Plantago lanceolata**	Plantaginaceae	narrow leaved plantain	UPL
*Platanus ×hispanica**	Platanaceae	London plane tree	UPL
Quercus agrifolia	Fagaceae	coast live oak	UPL
*Quercus ilex**	Fagaceae	Holly oak	UPL
*Raphanus salivus**	Brassicaceae	Jointed charlock	UPL
Rubus ursinus	Rosaceae	Californian blackberry	FACW*
Sanicula sp.	Apiaceae	snake root	NI
*Senecio vulgare**	Asteraceae	common groundsel	FAC
Solanum sp.	Solanaceae	Solanum	NI
Toxicodendron diversilobum	Anacardiaceae	poison oak	UPL
Trifolium sp.	Fabaceae	clover	FACU*
*Trifolium campestri**	Fabaceae	hop clover	UPL
*Trifolium hirtum**	Fabaceae	rose clover	UPL
*Vicia sativa**	Fabaceae	spring vetch	FACU
*Vicia villosa**	Fabaceae	hairy vetch	UPL

Attachment 3. Significance Criteria and Relevant Goals, Policies, and Laws

Significance Criteria

Approval of general plans, area plans, and specific projects is subject to the provisions of the California Environmental Quality Act (CEQA). The purpose of CEQA is to assess the significance of a proposed project's impacts on the environment before they are carried out. Whenever possible, public agencies are required to avoid or minimize environmental impacts by implementing practical alternatives or mitigation measures.

According to *2019 CEQA Status and Guidelines* (2019), a significant effect on the environment means a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest."
Specific project impacts to biological resources may be considered "significant" if they would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065(a) states that a project may trigger the requirement to make a "mandatory findings of significance" if the project has the potential to "substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

RELEVANT GOALS, POLICIES, AND LAWS

<u>Threatened and Endangered Species</u>
State and federal "endangered species" legislation has provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining

populations. Species listed as threatened or endangered under provisions of the state and federal endangered species acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as "species of special status." Permits may be required from both the CDFW and USFWS if activities associated with a proposed project will result in the "take" of a listed species. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Wildlife Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are responding agencies under the California Environmental Quality Act (CEQA). Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

Migratory Birds

Most bird species are protected by state and federal laws. The State of California signed Assembly Bill 454 into law in 2019, which clarifies native bird protection and increases protections where California law previously deferred to Federal law. The Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., sec. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

Birds of Prey

Birds of prey are also protected in California under provisions of the State Fish and Wildlife Code, Section 3503.5, 1992), which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto". Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFW.

Bats

Section 2000 and 4150 of the California Fish and Wildlife Code states that it is unlawful to take or possess a number of species, including bats, without a license or permit as required by Section 3007. Additionally, Title 14 of the California Code of Regulations states it is unlawful to harass, herd, or drive a number of species, including bats. To harass is defined as "an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering." For these reasons, bat colonies in particular are considered to be sensitive and therefore, disturbances that cause harm to bat colonies are unlawful.

Wetlands and Other Jurisdictional Waters

The U.S. Army Corps of Engineers (USACE) regulates the filling or grading of waters of the U.S. under the authority of Section 404 of the Clean Water Act (CWA). Natural drainage channels and adjacent wetlands may be considered waters of the United States (hereafter referred to as "jurisdictional waters") subject to the jurisdiction of the USACE. The extent of jurisdiction has been defined in the Code of Federal Regulations and clarified in federal courts.

In 2015, the EPA and USACE jointly issued the Clean Water Rule (CWR), providing a synthesized definition of waters of the U.S. based on statute, science, and federal court decisions to date. Subsequent litigation delayed implementation of the CWR. However, in August 2018, the CWR was enjoined in 22 states including California.

On September 12, 2019 the EPA and USACE repealed the 2015 CWR. However, new definitions of what constitutes a water of the U.S. have not been presented by the EPA or USACE. Furthermore, the repeal does not become effective until 60 days after the September publication of the appeal in the Federal Register. Therefore, at the time of this analysis the CWR is still in effect. However, this will soon change.

The Clean Water Rule defines Waters of the U.S. to include the following:

1. All waters used in interstate or foreign commerce (also known as traditional navigable waters), including all waters subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands:
3. The territories seas;
4. All impoundments of Waters of the U.S.;
5. All tributaries of waters defined in Nos. 1 through 4 abover, where "tributary" refers to a water (natural or constructed) that contributes flow to another water and is characterized by the physical indicators of a bed and bank and an ordinary high water (OHW) mark;
6. Adjacent waters, defined as either (a) located in whole or in part within 100 feet of the OHW mark of waters defined in Nos. 1 through 5 above, or (b) located in whole or in part within the 100-year floodplain and within 1,500 feet of the OHW mark of waters defined in Nos. 1 through 5 above;
7. Western vernal pools, prairie potholes, Carolina bays and Delmarva bays, pocosins, and Texas coastal prairie wetlands, if determined on a case-specific basis to have a significant nexus to waters defined in Nos. 1 through 3 above;
8. Waters that do not meet the definition of adjacency, but are determined on a case-specific basis to have a significant nexus to waters defined in Nos. 1 through 3 above, and are either (a) located in whole or in part within the 100-year floodplain of waters defined in Nos. 1 through 3 above, or (b) located within 4,000 feet of the OHW mark of waters defined in Nos. 1 through 5 above.

The 2015 rule also redefines exclusions from jurisdiction, which include:

1. Waste treatment systems;
9. Prior converted cropland;
10. Artificially irrigated areas that would revert to dry land should application of irrigation water to the area cease;
11. Groundwater;
12. Stormwater control features constructed to convey treat or store stormwater created in dry land; and
13. Three types of ditches: (a) ditches with ephemeral flow that are not a relocated or excavated tributary, (b) ditches with intermittent flow that are not a relocated or excavated tributary or that do not drain wetlands, and (c) ditches that do not flow, either directly or through another water, to a traditional navigable water.

A ditch may be a water of the U.S. only it if meets the definition of "tributary" and is not otherwise excluded under the provision.

All activities that involve the discharge of dredge or fill material into Waters of the U.S. are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a CWA Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards.

Under the Porter-Cologne Water Quality Control Act of 1969, the State Water Resources Control Board has regulatory authority to protect the water quality of all surface water and groundwater in the State of California ("Waters of the State"). Nine RWQCBs oversee water quality at the local and regional level. The RWQCB for a given region regulates discharges of fill or pollutants into Waters of the State through the issuance of various permits and orders. Discharges into Waters of the State that are also Waters of the U.S. require a Section 401 Water Quality Certification from the RWQCB as a prerequisite to obtaining certain federal permits, such as a Section 404 Clean Water Act permit. Discharges into all Waters of the State, even those that are not also Waters of the U.S., require Waste Discharge Requirements (WDRs), or waivers of WDRs, from the RWQCB.

The RWQCB also administers the Construction Storm Water Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General Permit under the Construction Storm Water Program. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, storm water, or other pollutants into a Water of the U.S. may require a NPDES permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a Notification of Lake or Streambed Alteration. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

Local Ordinances

The City of San Bruno has a Heritage Tree Ordinance (Chapter 8.25 of the Municipal Code), which regulates the removal of heritage trees. The ordinance is based on the following stated premise:

> "...the city has been forested with a variety of healthy and valuable trees, the preservation and reforestation of which is necessary for the health, safety and welfare of the citizens of this city in order to preserve the scenic beauty and aesthetic values of the community; maintain property values; prevent erosion of topsoil; protect against flood hazards and the risk of landslides; counteract the pollutants in the air; maintain the climatic balance and decrease wind velocities; and relieve the public costs of installing and maintaining stormwater drainage systems. The vast majority of trees in the community are located on private property, and the provisions in Chapter 8.24 for the protection of street trees are inadequate to fully protect and preserve the city's urban forest canopy against the

> unregulated pruning and removal of mature trees on private property. It is reasonable to expect property owners to maintain their trees in a satisfactory condition for the good of all of the citizens of the city of San Bruno."

The City defines heritage trees as:

1. Any native bay (*Umbellularia californica*), buckeye (*Aesculus* species), oak (*Quercus* species), redwood (*Sequoia sempervirens*), or pine (*Pinus radiata*) tree that has a diameter of six inches or more measured at fifty-four inches above natural grade;
2. Any tree or stand of trees designated by resolution of the city council to be of special historical value or of significant community benefit;
3. A stand of trees, the nature of which makes each dependent on the others for survival; or
4. Any other tree with a trunk diameter of ten inches or more, measured at 54 inches above natural grade.

A tree removal permit from the City of San Bruno would be required for removal or significant pruning (>25% of the canopy) of any heritage trees within private property. The permit may require an arborist report to accompany the permit to establish cause for removal. In addition, replacement trees would be required for removal of heritage trees. At a minimum tree replacement shall be a minimum of either two twenty-four-inch box size trees or one thirty-six-inch box size tree for each heritage tree removed. If tree replacement is not feasible for a project, a in lieu fee program is available for replacement trees. The determination of a site's inability to support replacement trees and the required replacement trees for a particular tree removal effort are to be determined by the director of public works or designee.

Memorandum

Date:	May 10, 2023
To:	Michael Smith, Senior Planner, City of San Bruno
Cc:	Kristi Black, Senior Environmental Planner, ICF
From:	Sean O'Brien, Senior Biologist, ICF and Shannon Henke, Botanist, ICF
Subject:	**300 Piedmont Avenue Project – Biological Survey Memo**

Introduction and Summary

ICF conducted biological surveys and prepared this technical memorandum for the 300 Piedmont Avenue Project (Project) located at 300 Piedmont, in the City of San Bruno (City), San Mateo County, California (Attachment A). The Project Sponsor, SummerHill Homes, proposes to redevelop a 40.2-acre former school site with 155 single-family detached homes and open space. SummerHill Homes would also dedicate open space land to the City, which would be improved with recreational facilities.

Biological resources and avoidance/minimization measures are summarized below:

- **Biological Resources**. Overall, the Project's biological resources documented in the applicant-prepared biological resources assessment (Live Oak Associates 2022[a]) and arborist report (HortScience | Bartlett Consulting 2022[b]) were confirmed. Three upland habitat types (developed/schoolgrounds, mixed pine eucalyptus forest, and ruderal grassland) were identified in the Survey Area. No aquatic habitats (e.g., wetlands/waters) were identified in the Survey Area. Trees documented in the arborist report were confirmed. One special-status species[c], the San Francisco dusky-footed woodrat *(Neotoma*

[a] Live Oak Associates. 2022. Biological resources assessment of 300 Piedmont Avenue in the City of San Bruno, CA (PN 2689-01). 19 pp. Dated: May 9, 2022

[b] HortScience | Bartlett Consulting. 2022. Preliminary arborist report. 36 pp. Dated: June 7, 2022

[c] For purposes of this memorandum, special-status species include species listed as threatened or endangered under the federal Endangered Species Act (FT or FE); species listed as threatened or endangered under the

fuscipes annectens) is presumed present onsite. Trees, shrubs, and buildings within the Project site also provide nesting habitat for migratory birds and raptors and roosting habitat for bats. No special-status plant species were observed.

- **Avoidance/Minimization Measures.** Avoidance and minimization measures should follow those presented in the applicant-prepared biological resources assessment (Live Oak Associates 2022). Focused preconstruction surveys are recommended for San Francisco dusky footed woodrats, nesting birds, and bats. If active San Francisco dusky footed woodrat nests, bird nests, or bat colonies are identified, then a temporary disturbance-free buffer will be established; otherwise, nest/colony dismantling will be conducted. Tree removal should occur in compliance with the municipal tree policy, which may include replacement of trees or payment of in-lieu fees for removed trees. See the Avoidance/Minimization Measures section below for more details.

More detail is provided below.

Methods

Prior to conducting the field survey, ICF reviewed existing and available online resources including California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB), California Natural Plant Society's (CNPS) Rare Plant Inventory, U.S. Fish and Wildlife's (USFWS) Information for Planning and Consulting (IPaC), USFWS's National Wetland Inventory (NWI), Google Earth, the applicant-prepared biological resources assessment (Live Oak Associates 2022), and the applicant-prepared arborist report (HortScience | Bartlett Consulting 2022).

The May 1, 2023, biological survey was conducted by ICF senior biologist Sean O'Brien and ICF botanist Shannon Henke and entailed documenting baseline biological conditions on the Project and a 100-foot buffer (Survey Area). The biological survey focused on characterizing and mapping suitable habitat for special-status species (including woodrat nests, bat habitat, nesting bird/raptors, special-status plants). Lists of species observed during the field survey were recorded. The survey did not include an aquatic resource delineation, protocol-level special status species surveys, or arborist surveys. The results of the biological field survey were compared to those found the applicant-prepared biological resources assessment (Live Oak Associates 2022) and arborist report (HortScience | Bartlett Consulting 2022).

California Endangered Species Act (ST or SE); species proposed for listing under either; California Department of Fish and Wildlife fully protected species (FP) or species of special concern (SSC). Special-status plants include California Rare Plant Rank (CRPR) status plants include: 1A = presumed extinct in California; 1B = rare, threatened, or endangered in California and elsewhere; and 2 = rare, threatened, or endangered in California but more common elsewhere

Results

Overall, the Project's biological resources documented in the applicant-prepared biological resources assessment (Live Oak Associates 2022) and arborist report (HortScience | Bartlett Consulting 2022) were confirmed. Representative photographs of the Project are provided in Attachment B. Plant and wildlife species observed during the survey are provided in Attachment C.

Habitats: Three upland habitat types (developed/schoolgrounds, mixed pine eucalyptus forest, and ruderal grassland) were identified in the Survey Area. No aquatic habitats (e.g., wetlands/waters) were identified in the Survey Area. Developed/schoolgrounds comprised the majority of the Project and included unused high school buildings, walkways, roadways, parking areas, turf grass fields, maintenance yards, storage facilities, and several mature landscape trees and bushes (e.g., deodar cedar [*Cedrus deodara*] and London plane tree [*Platanus* × *hispanica*]). Mixed pine eucalyptus forest was found along the margins of the Project, primarily on slopes, and was dominated by an overstory of Monterey pine (*Pinus radiata*) and red gum (*Eucalyptus camaldulensis*) with a dense understory of poison oak (*Toxicodendron diversilobum*) and Cushing manzanita (*Arctostaphylos glandulosa* subsp. *cushingiana*). Ruderal grassland was generally found in the margin between the developed and forested habitats and was dominated by ruderal grasses and forbs including (Italian rye grass [*Festuca perennis*] and ripgut brome [*Bromus diandrus*]). Trees documented in the arborist report (HortScience | Bartlett Consulting 2022) were confirmed.

Special-status Species[d]: One special-status wildlife species, the San Francisco dusky-footed woodrat *(Neotoma fuscipes annectens*) is presumed present onsite. Woodrat stick nests were observed within the mixed pine eucalyptus forest habitat during the May 1, 2023, field survey and were also documented in the applicant-prepared biological resources assessment (Live Oak Associates 2022). Trees, shrubs, and buildings within the Project provide nesting habitat for migratory birds, raptors and roosting habitat for bats. No special-status plant species were observed. The manzanita documented in the applicant-prepared biological resources assessment (Live Oak Associates 2022) was confirmed to be the non-special-status Cushing manzanita.

Avoidance/Minimization Measures: Avoidance and minimization measures should follow those presented in the applicant-prepared biological resources assessment (Live Oak Associates 2022).

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[d] For purposes of this memorandum, special-status species include species listed as threatened or endangered under the federal Endangered Species Act (FT or FE); species listed as threatened or endangered under the California Endangered Species Act (ST or SE); species proposed for listing under either; California Department of Fish and Wildlife fully protected species (FP) or species of special concern (SSC). Special-status plants include California Rare Plant Rank (CRPR) status plants include: 1A = presumed extinct in California; 1B = rare, threatened, or endangered in California and elsewhere; and 2 = rare, threatened, or endangered in California but more common elsewhere

- San Francisco Dusky-Footed Woodrat. Prior to project implementation, a qualified biologist should conduct a preconstruction survey for San Francisco dusky-footed woodrat nests within and adjacent to the project footprint no more than 30 days prior to the onset of construction activities. This survey timing allows for the scheduling of and relocation of woodrat nests, if necessary. The survey should encompass all construction zones and surrounding lands within 50 feet of these zones.

  All identified nests should be avoided, where possible. It is expected that avoidance of all or most of the nests should be feasible, as most of the area where construction would occur is already developed and is unsuitable habitat for nest development. Woodrat nests that occur within 50 feet of the project work area should have a physical buffer established around them demarcated by flagging, exclusion fencing, or other suitable materials, as determined by a qualified biologist. If avoidance of a nest is not possible, the nest(s) would need to be manually relocated when young are not present using the following methods.

  - To safely dismantle a nest, the dismantling process should occur in October through December under the direction of a qualified biologist. If this timing is not feasible or compatible with the timing of construction, the biologist could dismantle the nest at a different time, but if baby woodrats (i.e., pups) are exposed during the process, the nest would need to be re-built over the pups, and the nest should be buffered for approximately 3 weeks before dismantling can recommence. To start dismantling, a landscape crew or other qualified crew would be present onsite with the qualified biologist to clear vegetation for the qualified biologist to access the nest(s). All persons involved in the removal of materials (biologist and landscape crew) should wear a respirator, long sleeves, and gloves during the disassembling and removal process to reduce the potential for exposure to hantavirus, rotavirus, and other diseases that woodrat nests may contain. Two to three temporary shelters such as an upside-down half-wine barrel or wooden box with rodent-sized opening shall be placed near the nest to be disassembled to provide any evicted woodrats a safe cover (refugia). Deconstruction of the nest will be conducted by the biologist on the opposite side of the nest as temporary refugia so that woodrats have a direct path to the refugia.
  - Disassembling work is to be conducted by a qualified biologist in afternoon/evening hours to the extent practicable to limit stress to any evicted woodrats. Deconstructed nest material will be placed on a tarp to either dispose of it or to use it to rebuild a nest with the same material in a different location. Materials on the tarp should include structural, nesting chamber, and stored food. Relocation of nests should be built as close as possible with a center chamber at the bottom with nesting material and food stores with sticks forming a chamber above this. If forming a nest chamber is difficult given the material of the original nest, additional sticks from the surrounding areas can be used or a wooden box with a hole cut for the entrance can be used.

- **Nesting Raptors and Migratory Birds**. If tree removal or ground disturbance activities are scheduled to commence during the breeding season (February 1 through August 31), pre-construction nesting bird surveys should be conducted by a qualified biologist to identify

possible nesting activity. A construction-free buffer of suitable dimensions must be established around any active raptor and migratory bird nests (up to 250 feet, depending on the location and species) for the duration of the project or until it has been determined that the chicks have fledged and are independent of their parents.

- **Bats**. A pre-construction survey for roosting bats is recommended within the project footprint and a surrounding 50-foot buffer. If a non-breeding or non-wintering bat colony is found, the individuals should be humanely evicted via the partial dismantlement (two-step removal) of the trees or buildings prior to removal under the direction of a qualified biologist to ensure that no harm or take would occur to any bats as a result of removal activities. If a maternity colony or overwintering colony is detected in the trees or buildings of the site, then a construction-free buffer should be established around the tree(s) and remain in place until it has been determined that the nursery or overwintering colony is no longer active.
- **Trees**. Several trees of the site qualify as protected heritage trees by the City of San Bruno and will require removal to accommodate future buildout of the project site. Tree removal and preservation should occur pursuant to the City of San Bruno's tree ordinance. This will require a tree removal permit for removal of heritage trees. Replacement of removed trees would be required as part of project conditions. The number and size of replacement trees would be determined by the City's director of public works. If replacement trees cannot be accommodated, payment into the city's tree planting fund may be available.

Attachment A
Project Location

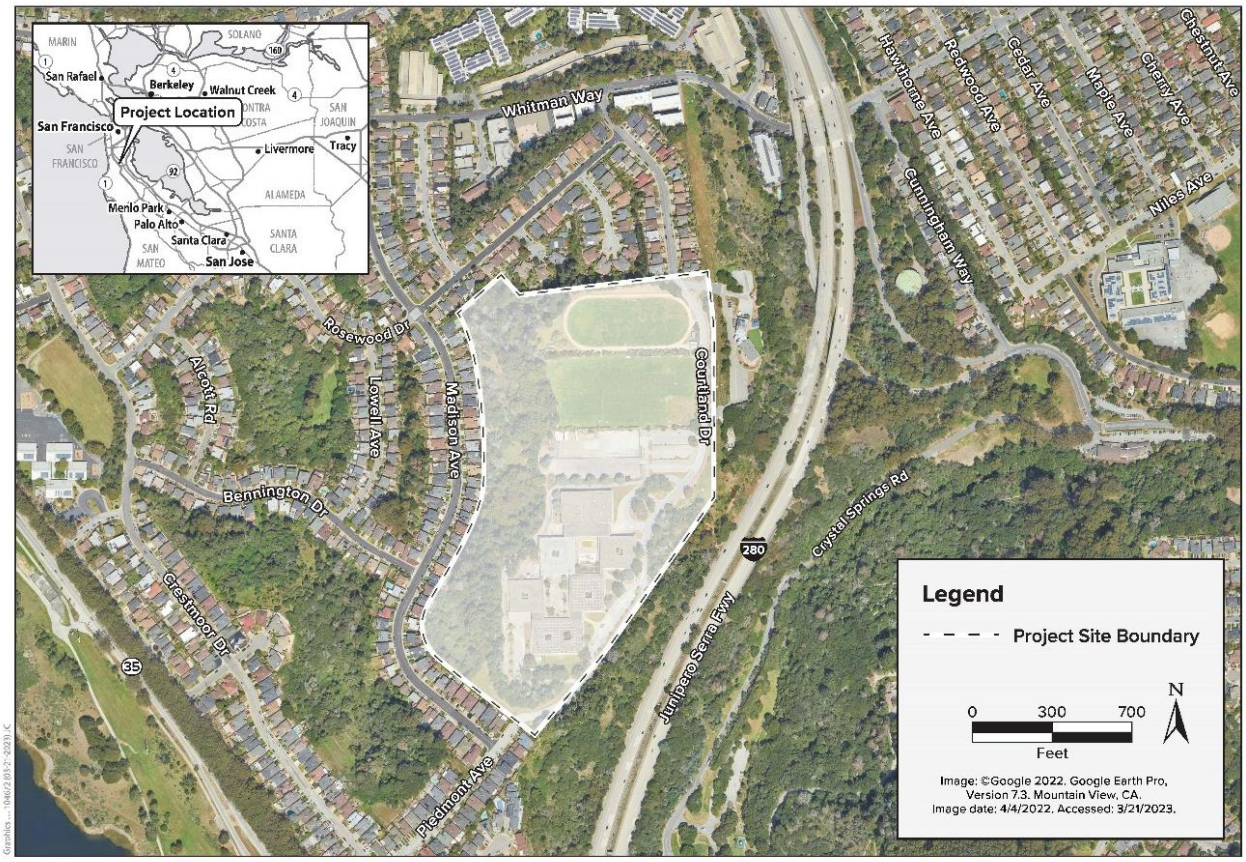


Figure 1
Project Location
Crestmoor/300 Piedmont Avenue Project

Attachment B
Representative Photographs (Taken on May 1, 2023)



Photograph 1. Developed/schoolgrounds habitat type (facing east).



Photograph 2. Mixed pine eucalyptus forest habitat type (left side of photo) and developed/schoolgrounds habitat type (right side of photo) and (facing north).



Photograph 3. Mixed pine eucalyptus forest habitat type (facing west).



Photograph 4. Ruderal grassland habitat type (left side of photo) and mixed pine eucalyptus forest habitat type (right side of photo) and (facing north).

Attachment C
Species Observed

Table C1. Plants Observed

Scientific Name	Common Name	Orgin
Trees		
Acacia melanoxylon	Blackwood acacia	Introduced
Aesculus californica	Buckeye	Native
Arbutus menziesii	Pacific madrone	Native
Cedrus deodara	Deodar cedar	Introduced
Chamaecyparis lawsoniana	Port orford cedar	Native
Eucalyptus citriodora	Lemon scented gum	Introduced
Eucalyptus globulus	Blue gum	Introduced
Pinus radiata[e]	Monterey pine	Native
Platanus ×hispanica	London plane tree	Introduced
Quercus agrifolia var. *agrifolia*	Coast live oak	Native
Shrubs		
Arctostaphylos glandulosa subsp. *cushingiana*	Cushing manzanita	Native
Baccharis pilularis	Coyote brush	Native
Ceanothus thyrsiflorus	Blueblossom	Native
Cotoneaster lacteus	Milkflower cotoneaster	Introduced
Genista monspessulana	French broom	Introduced
Heteromeles arbutifolia	Toyon	Native
Lonicera hispidula	Pink honeysuckle	Native
Quercus suber	Cork oak	Introduced
Rubus ursinus	California blackberry	Native
Salix lasiolepis	Arroyo willow	Native
Toxicodendron diversilobum	Poison oak	Native
Forbs		
Acmispon americanus	American bird's foot trefoil	Native
Agoseris grandiflora	Giant mountain dandelion	Native
Bellis perennis	English lawn daisy	Introduced
Bromus catharticus	Rescue grass	Introduced
Calendula arvensis	Field marigold	Introduced

[e] *Pinus radiata* is CRPR 1B.1 special-status species in its natural range which is now restricted to Año Nuevo, Cambria, and the Monterey Peninsula. It has been introduced and naturalized outside of its native range in California and elsewhere.

Scientific Name	Common Name	Orgin
Cardamine hirsuta	Hairy bitter cress	Introduced
Carduus pycnocephalus	Italian thistle	Introduced
Carpobrotus edulis	Iceplant	Introduced
Cirsium vulgare	Bullthistle	Introduced
Claytonia perfoliata	Miner's lettuce	Native
Cotula australis	Brass buttons	Introduced
Epipactis helleborine	Helleborine	Introduced
Erodium moschatum	Whitestem filaree	Introduced
Euphorbia peplus	Petty spurge	Introduced
Foeniculum vulgare	Fennel	Introduced
Fumaria parviflora	Fine leaved fumitory	Introduced
Galium aparine	Cleavers	Native
Geranium dissectum	Wild geranium	Introduced
Geranium molle	Crane's bill geranium	Introduced
Hedera helix	English ivy	Introduced
Helminthotheca echioides	Bristly ox-tongue	Introduced
Hirschfeldia incana	Mustard	Introduced
Iris douglasiana	Douglas iris	Native
Lactuca serriola	Prickly lettuce	Introduced
Lamium purpureum	Purple dead nettle	Introduced
Leontodon saxatilis	Hawkbit	Introduced
Leucojum aestivum	Summer snowflake	Introduced
Linum bienne	Flax	Introduced
Lotus corniculatus	Bird's foot trefoil	Introduced
Lupinus microcarpus	Chick lupine	Native
Malva parviflora	Cheeseweed	Introduced
Marah fabacea	California man-root	Native
Matricaria discoidea	Pineapple weed	Native
Medicago polymorpha	California burclover	Introduced
Papaver somniferum	Opium poppy	Introduced
Plantago coronopus	Cut leaf plantain	Introduced
Plantago lanceolata	Ribwort	Introduced
Plantago major	Common plantain	Introduced
Pseudognaphalium californicum	Ladies' tobacco	Native
Pseudognaphalium luteoalbum	Jersey cudweed	Introduced
Raphanus sativus	Jointed charlock	Introduced
Rumex acetosella	Sheep sorrel	Introduced
Rumex pulcher	Fiddleleaf dock	Introduced
Sanicula crassicaulis	Pacific sanicle	Native
Senecio vulgaris	Common groundsel	Introduced

Scientific Name	Common Name	Orgin
Sisyrinchium bellum	Blue eyed grass	Native
Sonchus asper	Spiny sowthistle	Introduced
Spergularia rubra	Purple sand spurry	Introduced
Stellaria media	Chickweed	Introduced
Taraxacum officinale	Red seeded dandelion	Introduced
Trifolium campestre	Hop clover	Introduced
Trifolium repens	White clover	Introduced
Vicia sativa	Spring vetch	Introduced
Vicia villosa	Hairy vetch	Introduced
Graminoids		
Briza maxima	Rattlesnake grass	Introduced
Bromus diandrus	Ripgut brome	Introduced
Bromus hordeaceus	Soft chess	Introduced
Cortaderia selloana	Pampas grass	Introduced
Festuca arundinacea	Reed fescue	Introduced
Festuca bromoides	Brome fescue	Introduced
Festuca perennis	Italian rye grass	Introduced
Holcus lanatus	Common velvetgrass	Introduced
Hordeum murinum	Foxtail barley	Introduced
Panicum acuminatum	Western witch grass	Native
Poa annua	Annual blue grass	Introduced
Poa pratensis	Kentucky blue grass	Introduced

Table C2. Wildlife Observed

Scientific Name	Common Name
Calypte anna	Anna's hummingbird
Columba livia	Rock dove
Corvus brachyrhynchos	American crow
Corvus corax	Common raven
Haemorhous mexicanus	House finch
Junco hyemalis	Dark-eyed junco
Larus occidentalis	Western gull
Melozone crissalis	California towhee
Molothrus ater	Brown-headed cowbird
Streptopelia decaocto	Eurasian collared dove
Sturnus vulgaris	European starling
Turdus migratorius	American robin
Zonotrichia albicollis	White-throated sparrow

Appendix D

Historic Resources Evaluation

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

esassoc.com

memorandum

date	June 3, 2022
to	Sam Rosen, SummerHill Homes
cc	Candace Ehringer, ESA
from	Becky Urbano, Johanna Kahn, and Vanessa Armenta, ESA
subject	Draft Historic Resource Evaluation for 300 Piedmont Avenue, San Bruno

SummerHill Homes proposes to develop a 40-acre parcel at 300 Piedmont Avenue (APN 019170020) with residential uses (Project). The site is currently occupied by the former Crestmoor High School which was constructed in 1961-62 and would be completely demolished as part of the Project. The subject property is over 45 years in age and meets the California Office of Historic Preservation's age threshold for consideration as a historical resource. As such, the Project requires an evaluation of the subject property as a potential historical resource. In compliance with California Environmental Quality Act (CEQA), this memo presents ESA's findings for the subject property's individual eligibility for listing in the California Register of Historical Resources (California Register).[1]

A California Department of Parks and Recreation (DPR) Series 523 form set for 300 Piedmont Avenue is included at the end of this memo.

Current Historic Status

The subject property at 300 Piedmont Avenue is not currently listed in the California Office of Historic Preservation's Built Environment Resource Directory (BERD) for San Mateo County. It is also not on file at the Northwest Information Center of the California Historical Resources Information System.[2] This indicates that it is not currently listed in the National Register of Historic Places, California Register, or a local register.

1 Typically, historic resource evaluations also evaluate a potential historic resource for eligibility for listing on a local register. The City of San Bruno does not maintain a city-wide historic resource inventory, nor is a local historic preservation ordinance currently in effect. The 2009 San Bruno General Plan includes a policy to develop criteria for local designation (ERC-35), but it has not been implemented at this writing. A historic resource inventory was produced for the San Bruno Redevelopment Area in 2003, but the subject property is located outside of the redevelopment plan area.

2 Northwest Information Center, California Historical Resources Information System, Sonoma State University, records search for 300 Piedmont Avenue, San Bruno, California (File No. 21-1814), results on file at ESA, May 9, 2022.

Archival Research

For this memo, ESA staff conducted online archival research to document the development of the subject property and relevant historic contexts. The sources accessed include:

- San Mateo Unified School District general information;[3]
- San Mateo County Property Maps Portal;[4]
- City of San Bruno building permits;[5]
- Newspapers.com for local newspaper articles (1960s);[6]
- UC Santa Barbara's FrameFinder for historic aerial photographs (1960s-2000s);[7] and
- USModernist Architecture Magazine Library.[8]

For a complete list of resources cited in this report, refer to the bibliography at the end of the document.

Architectural Description

ESA architectural historians Becky Urbano and Vanessa Armenta performed a pedestrian survey of the subject property on April 13, 2022. The following architectural description is based on observations made in the field.

Site

The subject property is located between Interstate 280 (Junipero Serra Freeway) to the east and the Crestmoor Park residential subdivision to the west (**Figure 1**). While it is addressed 300 Piedmont Avenue, the subject property is located near the road's transition into Courtland Drive. The 40.19-acre (1,751,033-square-foot) parcel is occupied by the Pen/Crest Center (previously Crestmoor High School) and includes six connected buildings (Buildings A, B, C, D, E, and F), three small parking lots near the south end of the school, and two sports fields and a large parking lot near the north end of the school. There is a parking lot in front of the main entrance to the school, which is located at the south end of Buildings A and B, and the parking lot is separated from Courtland Drive by a narrow strip of landscaping with a concrete curb. The two other small parking lots are located on the north and south sides of Building C. There is a vehicular pick-up/drop-off area accessible from Courtland Drive near the east side of Building F and north side of Building D. A perimeter road around the school buildings begins and ends at Courtland Drive.

3 *San Mateo Union High School District*, https://www.smuhsd.org/, accessed June 1, 2022.
4 San Mateo County, *Property Maps Portal*, https://gis.smcgov.org/Html5Viewer/?viewer=raster, accessed June 1, 2022.
5 City of San Bruno, *eTRAKiT*, https://etrakit.sanbrunocable.com/etrakit3/, accessed June 1, 2022.
6 *Newspapers.com*, https://www.newspapers.com/, accessed June 1, 2022.
7 UC Santa Barbara, *FrameFinder*, https://mil.library.ucsb.edu/ap_indexes/FrameFinder/, accessed June 1, 2022.
8 "Architecture Magazine Library," *USModernist*, https://usmodernist.org/library.htm, accessed June 1, 2022.



North is up. The subject property is outlined in red, and the six lettered buildings are labeled.

SOURCE: Google Maps, 2022; edited by ESA

Figure 1
Aerial view of the subject property

Exterior

300 Piedmont Avenue is improved with the Minimalist-style complex formerly known as Crestmoor High School which was constructed in 1961-62 to serve the San Mateo Union High School District. The complex consists of six rectangular-plan building modules connected by a common roof structure, arranged around two off-set interior courtyards. Five building modules (Buildings A, B, C, D, and E) contain classrooms and offices. One building module (Building F) contains three former gymnasiums and associated spaces. The northern courtyard is fully occupied by two swimming pools. The southern courtyard contains a raised concrete platform, benches, and minimal landscaping. The connected building modules are arranged on an off-set grid that forms an irregular overall footprint. Buildings A, B, C, and E enclose the landscaped courtyard. Buildings B, D, E, and F enclose the courtyard with swimming pools. (The courtyards are described below.)

Buildings A, B, C, D, and E are constructed of steel-frame curtain walls. The steel frame is exposed on the exterior, and the glazed curtain walls are slightly recessed, a detail that emphasizes the non-load-bearing nature of the building envelope. The curtain walls consist of a tripartite vertical arrangement of aluminum-frame openings: an opaque, metal panel above; a large, central fixed window in the center; and a shallow panel containing either a louvered vent or a second opaque metal panel at the base. Many of the windows are covered with reflective tint (**Figure 2**). Some windows are covered with plywood to provide additional security. All six building modules are capped one shared, flat roof that serves to both enclose each module and connect the modules to form a unified plan. The spaces between the building modules are enclosed by banks of aluminum-frame system of glazed doors and transoms above that is similar to the curtain wall system. The roof overhangs each building module where it faces the interior courtyards, creating covered exterior circulation corridors (**Figure 3**).

The site slopes down to the north, creating variations in topography that are reflected in the building modules. Buildings A, B, and C are one story in height, while Buildings D, E, and F are two stories in height. Buildings D and E feature wrap-around aluminum-frame balconies at the second floor that face Courtland Drive and the surrounding parking lots. Building F contains double-height interior spaces, And this is reflected on the exterior by an absence of balconies or other notable features. Building F is predominately clad in opaque metal panels within an aluminum-frame grid.



SOURCE: ESA, 2022

Figure 2
Main entrance between Building A and Building B, view facing northwest



SOURCE: ESA, 2022

Figure 3
Typical covered outdoor corridor adjacent to a courtyard

Interior Spaces

Buildings B, C, D, and E are square in plan, and each features a central, square- interior courtyard. These building modules each contain two east-west-oriented hallways located in the northern and southern thirds of the modules. This allows for each rows of classrooms located around the perimeters to have at least one wall of exterior windows. Additionally, each building module contains a series of rooms that are accessed from the east-west-oriented hallways and feature a wall facing the interior courtyard. It is assumed that the original layout of classrooms provided for natural light in each room; however, many rooms have been subdivided for other purposes. At this writing, some rooms no longer have access to natural light.

Building A is a modified version of the floor plan of the other building modules. It is rectangular in plan, with two square interior courtyards located at the north-south midline of building. On the interior, there are three north-south-oriented hallways: one each near the east and west ends of the building and one bisecting the building. This central hallway forms the centerline of the grouping formed by Buildings A, B, C, and E. It is this grouping that originally served as the main educational spaces for Crestmoor High School. Building F contains three double-height spaces originally used as gymnasiums. It does not contain central hallways or skylights.

The steel frame and curtain wall construction allows for maximum flexibility of the interior room layouts and placements. While most rooms are aligned, with regular-sized spaces arranged in a logical grid, the double-loaded corridors feature walls that undulate (**Figure 4**). This unusual feature is found in Buildings A, B, C, D, and E.

The southern courtyard is flat and at grade level. It contains a central, raised concrete platform enclosed by concrete planters and accessed by several sets of low-rise concrete stairs (**Figure 5**). Cork trees, integrated concrete benches, and faded paint on the ground for a basketball court and other recreational activities remain. Given the small size of the cafeteria, this courtyard appears to have served as the main dining and social space of Crestmoor High School.

The northern courtyard is at grade level, which is below the grade of the southern courtyard. The slope of the site in this area results in a courtyard enclosed by two-story buildings. The swimming pools are accessed from the lower levels of Buildings D and E or from the covered walkway along the southern façade of Building F. A set of concrete bleachers is built into the southern wall of the courtyard and is accessed from the walkway along the northern side of Building B (**Figure 6**).



SOURCE: ESA, 2022

Figure 4
Interior view of a corridor in Building A with undulating walls and skylights



SOURCE: ESA, 2022

Figure 5
Southern courtyard, view facing south



SOURCE: ESA, 2022

Figure 6
Northern courtyard, view facing south

Surrounding Area

The Project site is located in the city of San Bruno, California, between Interstate 280 and State Route 35, and is adjacent to the Crestmoor Park residential subdivision. The site slopes slightly to the north and overlooks a steep grade change to the east. This once wooded and hilly section of San Bruno was first developed in the 1950s. At that time, the single-family Crestmoor Park subdivision was completed. Interstate 280 (Junipero Serra Freeway) was constructed along the eastern portion of the Project site in 1955. Today, the surrounding area is characterized as predominantly residential, and the San Bruno Chinese Church is located across Courtland Drive from the track and field recreational area associated with the Property located at the north end of the campus.

Site History and Construction Chronology

Around 1853, Alfred Green established a dairy in what would eventually become the City of San Bruno.[9] Numerous members of Green's extended family also settled the land and were joined by a few other settlers during the 19th century. The area remained largely undeveloped and devoid of dense settlement, and apart from dairy and ranching operations, transportation was the main economic driver for the area. During this time, the subject property was part of the Buri Buri Rancho that was eventually subdivided and sold to multiple landowners. During the early 1900s, the land was primarily used for raising cattle and other agricultural purposes,[10] and most residential and commercial development in San Bruno was located to east along El Camino Real.[11]

9 Mark Still, "From Gold Rush to Great War," *La Peninsula: The Journal of the San Mateo County Historical Association* 42, no. 2 (Summer 2014), p. 8.

10 Frank M. Stanger, "A California Rancho under Three Flags: A History of Rancho Buri Buri in San Mateo," *The California Historical Society Quarterly* 17, no. 3 (September 1938), pp. 245–59.

11 ESA, *SFO Noise Insulation Program, 2020 Grant Group 1: Cultural Resources Survey Report*, prepared for FAA and San Francisco International Airport, (January 2022), pp. 19-21.

The advent of World War II brought major changes to the small community. Like many other parts of the peninsula, the government transformed large areas of farmland and other undeveloped land for use as barracks, training grounds, and military support infrastructure. This growth was augmented by the increasing importance of the San Francisco Municipal Airport, which was established in 1927 and eventually became the San Francisco International Airport. Proximity to the airfield made San Bruno a desirable location for military planners, and the city once built a Japanese-American internment camp at the Tanforan Racetrack and the U.S. Army's Western Region Advance Personnel Depot on lands immediately west of the racetrack.

During this time, the former farmland west of El Camino Real was subdivided. Between 1940 and 1960, the population of San Bruno grew from 6,500 to 29,000, which increased to 36,000 by 1970.[12] It is during this period of substantial postwar development that Interstate 280 was constructed and the area around the subject property was subdivided. The land immediately to the west of the subject property was purchased by developer George Williams, who established the Crestmoor Park residential subdivision in the early 1950s.[13] The increasing development of the city led to the need for additional schools to be built to accommodate the growth in the student population and to relieve the congestion at Capuchino High School and Mills High School.

In 1960, a $3.75 million school bond measure was passed to expand schools in the San Mateo Union High School District, and $3.3 million was allotted for the design and construction of a new high school in San Bruno.[14] At that time, the San Mateo Union High School District faced an overabundance of students and needed to construct "five more high schools in relatively quick succession: Capuchino, Hillsdale, Mills, Aragon[,] and Crestmoor."[15] Crestmoor High School was designed by architect John Lyon Reid and built in 1961-62 by general contractor Williams and Burrows, Inc.,[16] and it officially opened on September 5, 1962 (**Figure 7 and Figure 8**). The design was reported to be "similar to Mills and Hillsdale highs [also designed by Reid] in the interior [and] will have a capacity of 1,750 students."[17] Additionally, the school featured an "ultra-modern language laboratory which alone cost $6,145.46."[18] This and other features of the new high school were described by John Christgau who coached the school's first varsity basketball team:

> *The opening of the brand-new, $4 million Crestmoor High School after just two years of construction was...amazing and miraculous.*
>
> *At first, everybody in the community was excited [by its opening]. The angled corridors, the white-tile floors, and the I-beam construction gave the school an orderly, efficient look...*
>
> *Crestmoor High was a powerhouse in the making. The modern language lab had glass study carrels with earphones for listening to language lessons. The science labs and the art wing had panoramic views of the entire bay. The modular walls meant that classrooms could mutate like*

12 City of San Bruno, San Mateo County, *Bay Area Census*, 1950, 1960, 1970, www.bayareacensus.ca.gov/cities/San Bruno.htm, accessed June 1, 2022.

13 "Crestmoor," *Burlingame Properties*, https://burlingameproperties.com/neighborhoods/crestmoor, accessed June 3, 2022.

14 "Tate Urges 'Yes' Vote on School Bonds," *San Mateo Times*, September 30, 1960, sec. 2, p. 23.

15 "General Information / History of Our District," *San Mateo Union High School District*, https://www.smuhsd.org/Page/3621, accessed June 3, 2022.

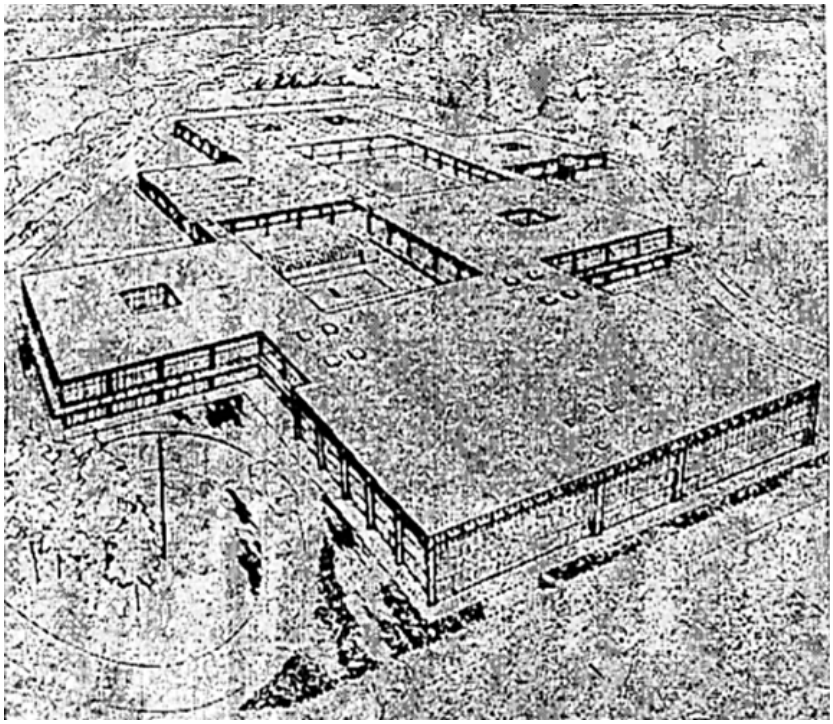
16 "Crestmoor Bid Won by Williams, Burrows Firm," *San Mateo Times*, May 26, 1961, sec. 2, p. 8.

17 "Bonds Sought for Crestmoor High School," *San Mateo Times*, May 20, 1960, sec. 2, p. 1.

18 "Crestmoor Officially Completed," *San Mateo Times*, November 13, 1962, sec. 2, p. 4.

huge cells. The little theater had upholstered cushion seats and a sound and light control room for the stage crew.[19]

There were two swimming pools in the center of the school, giving the campus the look of a country club.[20]



Building F is in the foreground.

SOURCE: *San Mateo Times*, August 23, 1962

Figure 7
Architect's rendering of Crestmoor High School

19 John Christgau, *Michael and the Whiz Kids: A Story of Basketball, Race, and Suburbia in the 1960s* (Lincoln, NE: University of Nebraska Press, 2013), p. 21.

20 Ibid., p. 22.



SOURCE: FrameFinder, Flight ID CAS-65-130

Figure 8
Aerial photograph of Crestmoor High School, 1965

Despite its initial warm reception, Crestmoor High School "faced a steep enrollment decline," and it was permanently closed in 1980.[21] Building A was reopened in 1980 as Peninsula High School, a continuation school. By 1990, the campus was known as the Pen/Crest Center,[22] a "mixed educational, business, nonprofit, mega-courtroom, and recreation center" that, at one time, was occupied by 58 different tenants including Peninsula High School.[23]

By 1991, Building F was converted for use by the San Mateo County Superior Court, and the auditorium was upgraded to support a state-of-the-art courtroom in the early 1990s.[24] In 2006, a room was added to the Crayon College Preschool,[25] which occupied Building E. No other completed building permits are on file at the City of

21 "General Information / History of Our District," *San Mateo Union High School District,* https://www.smuhsd.org/Page/3621, accessed June 3, 2022.

22 "Safeco Insurance Company of America, et al. v. Roxani Gillespie, B063893," *California Court of Appeal, Second Appellate District, Records and Briefs*, Exhibit A, p. 2, https://www.google.com/books/edition/California_Court_of_Appeal_2nd_Appellate/Uv_cSCQtXL8C?hl=en&gbpv=0, accessed June 1, 2022.

23 Daniel Carlson, *Reusing America's Schools* (Washington, D.C.: Preservation Press, 1991), pp. 19, 21.

24 *Memoirs: Brobeck, Phleger & Harrison LLP, Attorneys at Law, 1926-1996* (San Francisco, CA: Brobeck, Phleger & Harrison, 1996), p. 65.

25 City of San Bruno, Permit no. FC0608-0001, finaled August 16, 2006, https://etrakit.sanbrunocable.com/etrakit3/, accessed June 1, 2022.

San Bruno. A review of historic aerial photographs indicates that the subject property very closely resembles its original design. There have been no significant additions or alterations, and the site plan is substantially intact.

Historic Context

Ownership and Occupancy History

300 Piedmont Avenue has historically been owned by the San Mateo Union High School District and operated as Crestmoor High School from 1962 until it closed in 1980.[26] A portion of the school reopened as Peninsula High School in 1980.[27]

By 1990, the campus was known as the Pen/Crest Center, and over the subsequent decades, it was occupied by dozens of tenants. In 1991, tenants included Peninsula High School (which had 240 students enrolled); small businesses such as a specialty food firm, an acupuncturist, an insurance agent, a children's gymnastics school, and a computer services firm; a "mega-courtroom" for the San Mateo County Superior Court that accommodated hundreds of attorneys simultaneously; law offices; a YMCA preschool/daycare and several other nonprofit service providers; and two churches.[28] There was also a 1,600-square-foot meeting room named the Ridgeview Room that could be rented by the public for meetings and special events.[29] Preliminary research identified the specific buildings on the campus that were occupied by several tenants. These include the Crayon College Preschool, which occupied Building E from at least 2006 until 2020,[30] and the Central Peninsula Church, which occupied a portion of Building D from 2011 until 2017.[31]

By the end of the 2021 academic year, the campus was completely vacant.[32]

Design Professionals

For the purposes of historic resource evaluations, architects and landscape architects are typically considered to be the design professionals associated with a building or development. Depending on the situation, the engineer may also be considered to be a design professional. Contractors (which are identified above under the Site History and Construction Chronology) are generally not considered to be design professionals.

Architect

The design of 300 Piedmont Avenue is attributed to master architect John Lyon Reid (1906-82) and his firm Reid, Rockwell, Banwell & Tarics. Reid received his architectural training at the University of California Berkeley and the Massachusetts Institute of Technology (MIT). He also taught architecture at MIT from 1932 to 1946.

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26 "About Us / History," *San Mateo Union High School District*, https://www.smuhsd.org/Page/http%3A%2F%2Fwww.smuhsd.org%2Fsite%2Fdefault.aspx%3FPageID%3D2116, accessed May 31, 2022.

27 "General Information / Crestmoor Information," *San Mateo Union High School District*, https://www.smuhsd.org/Page/13243, accessed June 3, 2022.

28 Daniel Carlson, *Reusing America's Schools* (Washington, D.C.: Preservation Press, 1991), pp. 21-22.

29 Ibid.

30 City of San Bruno, Permit no. FC0608-0001, finaled August 16, 2006, https://etrakit.sanbrunocable.com/etrakit3/, accessed June 1, 2022.

31 "Our Story," *New North Church*, https://www.newnorth.church/get-to-know-us/our-story#content, accessed June 1, 2022.

32 "Pivotal Step for Sale of Former Crestmoor High School," *San Mateo Daily Journal*, https://www.smdailyjournal.com/news/local/pivotal-step-for-sale-of-former-crestmoor-high-school/article_cb48801e-54ef-11e9-9174-b72d006028c9.html, accessed June 3, 2022.

Beginning in 1946, he was a partner in the California architecture firm Bamberger & Reid which later became Reid, Rockwell, Banwell & Tarics and was known as Reid & Tarics Associates after 1962.[33]

Crestmoor High School was the last of four stylistically similar, Minimalist-style high school campuses designed by Reid for the San Mateo Union High School District.[34] The first was Hillsdale High School (extant; 3115 Del Monte Street in San Mateo), which opened in 1955 and received an honor award from the American Institute of Architects (AIA) in 1956. The successful design of this building was used as a precedent for later high schools (**Figure 9**), including Mills High School which opened in 1958 (extant; 400 Murchison Drive in Millbrae) and Aragon High School which opened in 1960 (extant; 900 Alameda de las Pulgas in San Mateo).[35] Bay Area architectural historian Susan Dinkelspiel Cerny described the shared design principle of Hillsdale, Mills, Aragon, and Crestmoor high schools as follows:

> *Within the four [stylistically similar high schools], the geometric rigor of the Vierendal [sic] I-beam frames with large gray panels perfectly reflects American thought regarding postwar techno-optimism—technology could solve the world's problems, society would be totally rationalized, and schools would become factories mass-producing educated citizens—ideas many now find strangely quaint in this post-modern age.*[36]



SOURCE: Google Maps, 2022

Figure 9
Aerial view of Hillsdale High School, facing southeast

Other projects completed by Reid's firm include a chapel at the Robert Louis Stevenson School for Boys in Pebble Beach (for which he won an AIA honor award in 1965), industrial facilities for the U.S. Navy at Mare Island, the advanced isotope separation facility at the Lawrence Laboratory in Livermore, several buildings at the UC San Francisco Parnassus Campus in San Francisco (for one of which he won an AIA honor award in 1967) , and the applied sciences building at UC Santa Cruz.[37] In 1962, Reid was awarded the Medal of Honor for

33 "John Lyon Reid, FAIA" (obituary), *AIA Journal* 17, no. 14 (December 1982), p. 80.

34 Susan Dinkelspiel Cerny and Beth A. Armstrong, *An Architectural Guidebook to San Francisco and the Bay Area* (Salt Lake City, UT: Gibbs Smith, 2007), p. 147.

35 Ibid..

36 Ibid.

37 "John Lyon Reid," *Pacific Coast Architecture Database*, https://pcad.lib.washington.edu/person/399/, accessed June 1, 2022.

Distinction in Architecture at Rice University for his contributions to education and architecture. Over the course of his 36-year career, Reid designed more than 700 schools and university buildings in California and beyond.[38]

Public School Design in the Mid-20th Century

The massive population increase in California following World War II was the result of the baby boom (from the mid-1940s to the early 1960s) and an influx of new residents from other parts of the United States. By 1962, California had become the most populous state in the country. As residential and commercial development and expanded infrastructure were accelerated to meet the increasing demand, cities and suburbs expanded at a remarkable rate. Enormous pressure was put on education facilities to expand as the baby boomers reached school age.

Part of the response to the dramatic shortage of public schools and classroom space was a standardization of ideas about school design across the country. This new uniformity was facilitated through the creation of organizations, journals, and guidebooks dedicated to developing and disseminating ideas on school design. The type of school advocated for featured a contemporary design with a decentralized plan, low massing, indoor/outdoor space, natural light and ventilation, and an informal character. Pre-fabricated and modular elements also became popular and economic design choices in the post-war years, adding to the sense of uniformity in school design throughout a school district.

After the construction hiatus caused by World War II, the International Style, as pioneered by European architects Richard Neutra and Ludwig Mies van der Rohe, was adopted for many new schools (and other types of buildings) being constructed across America. Often unornamented and austere, International-style schools were sometimes called "learning factories." The individual, architect-designed schools of the pre-war era gave way to a period of post-war school design that reflected school district-level planning control and a nationwide trend toward standardization. The 1950s and 1960s saw the rise of predominantly one-story, open-plan public schools throughout California. A single story eliminated the need for extra corridors and stairwells and could be expanded through the addition of new wings, separate structures, or portable classrooms. Many new schools were necessarily located in suburban areas, where expanding horizontally was a viable option.[39] Indeed, John Lyon Reid's award-winning design for Hillsdale High School in San Mateo was described as one that would "shelter with grace the known program of the present, the unknown programs of the future, and change which is the sure aspect of secondary education. This original premise has been carried successfully to the finished building by allowing for convertibility."[40]

These schools were generally constructed where land was plentiful and are characterized by sprawling, low-profile buildings or clusters of buildings connected by covered walkways and possessing individual patios or open courtyards, encouraging air circulation and taking maximum advantage of the California climate. One-story buildings also substantially reduced the overall superstructure and consequent earthquake and fire risk, as access to the outdoors was readily available. Elementary schools were primarily designed to be one story in height, and high schools were commonly designed to be one or two stories in height.

38 "John Lyon Reid, FAIA" (obituary), *AIA Journal* 17, no. 14 (December 1982), p. 80.

39 Sapphos Environmental, Inc., *Los Angeles Unified School District: Historic Context Statement 1870 to 1969*, March 2014, p. 114.

40 C. Herbert Paseur, "Flexibility in School Design or the Ancient King and His Three Wise Architects," *AIA Journal* 32, no. 5 (November 1959), p. 94.

Minimalist Style, 1920 – Present

The Minimalist Style is a subset of Modernism, a movement that evolved as a reaction to the excessive ornament commonly used in the late 19th century. Originating in the post-World War I period, the Minimalist Style emerged from the De Stijl and Bauhaus movements of the 1920s and was also influenced by traditional Japanese architecture. The Minimalist Style emphasizes the use of simple design elements without ornamentation or decoration, reducing elements down to their essential forms. While the movement traces its origins to the early 20th century, the aesthetic became most popular during the 1960s through the 1980s.[41]

Character-defining features of the Minimalist Style include:

- Pure geometric forms; primarily rectilinear;
- Simple/plain materials in limited quantities;
- Neat and orderly arrangement of components;
- Repetition of details, finishes, fenestration, etc.; and
- Well-defined, uninterrupted lines.

Significance Evaluation

California Register Eligibility

The City of San Bruno does not maintain a historic resource register and does not currently have a set of local criteria to apply to the evaluation of potential historic resources. The following section provides the evaluation of individual historic significance for the subject property based on the pedestrian survey and research provided above, following California Register Criteria 1 through 4.

Criterion 1: Association with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States

Archival research indicates that the construction of the subject property reflects typical suburban development in the Crestmoor Park neighborhood of San Bruno in the early 1960s, and it does not appear to possess any unique significance for this association. It was constructed to address increased public school enrollment following the baby boom in the post-World War II years. As such, it follows trends and events that were common throughout California, especially in the San Francisco Bay Area from the 1950s through the 1970s. There is no evidence to suggest that the subject property is associated with any particular events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. For this reason, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 1.

Criterion 2: Association with the lives of persons important to local, California, or national history

The subject property was originally constructed as Crestmoor High School, which operated from 1962 to 1980. During that time, it was attended by numerous teachers and administrators and thousands of students. Since the 1980s, the subject property has been occupied by dozens of tenants, notably the Peninsula High School, San Mateo County Superior Court, and a variety of commercial, nonprofit, and religious organizations. Archival research did not identify any individuals who may be significantly associated with Crestmoor High School or any of the subsequent tenants. For this reason, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 2.

41 Jessica Stewart, "What is Minimalism?", *My Modern Met*, https://mymodernmet.com/what-is-minimalism-definition, accessed June 1, 2022.

Criterion 3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values

From the mid-1950s to the early 1960s, architect John Lyon Reid designed four stylistically similar high school campuses for the San Mateo Union High School District. The first was Hillsdale High School in San Mateo, which was designed in 1955. The second and third were Mills High School in Millbrae and Aragon High School in San Mateo, which were designed in 1958 and 1960, respectively. The last of the four campuses to be designed and built was Crestmoor High School, which occupied the subject property from 1962 to 1980. Whereas all four campuses are extant, only the first three continue to operate as public high schools in 2022.

Reid was a prominent California architect whose career spanned nearly four decades, during which time he designed more than 700 schools and university buildings. Several of his educational designs received honor awards from the AIA, the first of which was his design for Hillsdale High School in 1956. Other honor award recipients that year represented the "who's who" of American architects including Philip Johnson; Wurster, Bernardi & Emmons; and Skidmore, Owings & Merrill.[42] Reid qualifies as a master architect.

As one of four stylistically similarly high school campuses designed by Reid in San Mateo County, the former Crestmoor High School certainly embodies distinctive characteristics of mid-century Minimalist-style public school architecture. However, to be eligible under Criterion 3 "as a specimen of its type or period of construction [it must be] an important example (within its context) of building practices of a particular time in history."[43] Of the Reid-designed public high schools in San Mateo County, Crestmoor High School was the last to be built. When compared with Hillsdale High School, the first to be designed and the only recipient of a national design award, Crestmoor High School exhibits some similarities: it employs similar materials, one-story massing, flat roofs, and connected buildings organized around a central courtyard. However, the design of Hillsdale High School, which predated Crestmoor High School by seven years, was considered to be avant-garde and a reflection of national trends in public school design. Within this context, the former Crestmoor High School does not appear to rise to a level of significance as a property that embodies distinctive characteristics of a type, period, or method of construction. Similarly, as compared to other designs by Reid, it does not possess high artistic value because it does not express an aesthetic ideal or design concept more fully than other properties of its type.[44]

As stated above, John Lyon Reid is considered to be a master architect. To be eligible for listing under Criterion 3 as the work of a master, "the property must express a particular phase in the development of the master's career, an aspect of his or her work, or a particular idea or theme in his or her craft. A property is not eligible as the work of a master, however, simply because it was designed by a prominent architect."[45] For the same reasons presented above, the subject property does not appear to rise to a level of significance as the work of Reid.

For these reasons, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 3.

42 "News Bulletins," *Progressive Architecture* 37, no. 4 (April 1956), pp. 90-91.

43 California Register criteria are modeled closely after National Register criteria. National Park Service, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, 1997, p. 18, https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf, accessed June 1, 2022.

44 Ibid., p. 20.

45 Ibid.

Criterion 4: Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation

Because the subject building is an example of a common construction type (i.e., public high school) built using readily available materials (e.g., steel beams and glass) and designed in the common mid-century Minimalist Style, it has little to no potential to yield information important to the prehistory or history of the local area, California, or the nation. Therefore, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 4.

Integrity

A property must also retain sufficient integrity to convey its historical significance in order to be considered a historical resource. The California Register defines integrity as the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. As 300 Piedmont Avenue does not appear to be individually significant under any California Register criteria, a discussion of integrity is not applicable.

Conclusion

Based on a site survey, archival research, and the analysis presented in this memo, ESA recommends the building at 300 Piedmont Avenue as ineligible for individual listing in the California Register under any criteria. Additionally, the City of San Bruno does not maintain a city-wide historic resource inventory, nor is a local historic preservation ordinance currently in effect. As such, 300 Piedmont Avenue would not be considered a historical resource for the purposes of CEQA.

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State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 14 ***Resource Name or #:** (Assigned by recorder) 300 Piedmont Avenue
P1. Other Identifier: Crestmoor High School, Pen/Crest Center, Peninsula High School
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**

***a. County** San Mateo **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Montara Mountain **Date** 2022 **T** 4S 5W ; **R** __ ; __ ☐ **of** __ ☐ **of Sec** __ ; ____ **B.M.**

c. Address 300 Piedmont Avenue City San Bruno Zip 94066

d. UTM: (Give more than one for large and/or linear resources) Zone 10S , 550442.33 mE/ 4162913.5 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate)
APN 019-170-020

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The subject property is located between Interstate 280 (Junipero Serra Freeway) to the east and the Crestmoor Park residential subdivision to the west. While it is addressed 300 Piedmont Avenue, the subject property is located near the road's transition into Courtland Drive. The 40.19-acre (1,751,033-square-foot) parcel is occupied by the Pen/Crest Center (previously Crestmoor High School) and includes six connected buildings (Buildings A, B, C, D, E, and F), three small parking lots near the south end of the school, and two sports fields and a large parking lot near the north end of the school. There is a parking lot in front of the main entrance to the school, which is located at the south end of Buildings A and B, and the parking lot is separated from Courtland Drive by a narrow strip of landscaping with a concrete curb. The two other small parking lots are located on the north and south sides of Building C. There is a vehicular pick-up/drop-off area accessible from Courtland Drive near the east side of Building F and north side of Building D. A perimeter road around the school buildings begins and ends at Courtland Drive. (continued on page 3)

***P3b. Resource Attributes:** (List attributes and codes) HP15. Educational building; HP39. Other (multi-use building)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)



***P4. Resources Present:**
☒ Building ☐ Structure ☐ Object
☐ Site ☐ District ☐ Element of District
☐ Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #) Aerial view. The subject property is outlined in red, and the six lettered buildings are labeled. Source: Google Maps, 2022; edited by ESA.

***P6. Date Constructed/Age and Source:** ☒ Historic ☐ Prehistoric ☐ Both
1961-62, *San Mateo Times*

***P7. Owner and Address:**
San Mateo Union High School District
650 N. Delaware Street
San Mateo, CA 94401-1732

***P8. Recorded by:**
Becky Urbano & Vanessa Armenta / ESA
550 Kearny Street, Suite 800
San Francisco, CA 94108

***P9. Date Recorded:** April 13, 2022

***P10. Survey Type:** Intensive

***P11. Report Citation**: ESA. *Draft Historic Resource Evaluation for 300 Piedmont Avenue, San Bruno.* Prepared for SummerHill Homes. June 3, 2022.

***Attachments:** ☐NONE ☐Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐Other (List): _____

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) 300 Piedmont Avenue ***NRHP Status Code** 6Z

B1. Historic Name: Crestmoor High School
B2. Common Name: Pen/Crest Center, Peninsula High School
B3. Original Use: Public high school B4. Present Use: Vacant
***B5. Architectural Style:** Minimalist
***B6. Construction History:** (Construction date, alterations, and date of alterations)
See page 6

***B7. Moved?** ☒No ☐Yes ☐Unknown **Date:** N/A **Original Location:** N/A
***B8. Related Features:** The subject property is occupied by a complex of six connected buildings that surround two open-air courtyards. The site features several small parking lots and an athletic field. For additional information, see the description on page 1.

B9a. Architect: John Lyon Reid **b. Builder**: Williams and Burrows, Inc.
***B10. Significance: Theme** N/A **Area** San Bruno
Period of Significance N/A **Property Type** Educational **Applicable Criteria** N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Ownership and Occupancy History

300 Piedmont Avenue has historically been owned by the San Mateo Union High School District and operated as Crestmoor High School from 1962 until it closed in 1980.[1] A portion of the school reopened as Peninsula High School in 1980.[2]

By 1990, the campus was known as the Pen/Crest Center, and over the subsequent decades, it was occupied by dozens of tenants. In 1991, tenants included Peninsula High School (which had 240 students enrolled); small businesses such as a specialty food firm, an acupuncturist, an insurance agent, a children's gymnastics school, and a computer services firm; a "mega-courtroom" for the San Mateo County Superior Court that accommodated hundreds of attorneys simultaneously; law offices; a YMCA preschool/daycare and several other nonprofit service providers; and two churches.[2] There was also a 1,600-square-foot meeting room named the Ridgeview Room that could be rented by the public for meetings and special events.[3] Preliminary research identified the specific buildings on the campus that were occupied by several tenants. These include the Crayon College Preschool, which occupied Building E from at least 2006 until 2020,[4] and the Central Peninsula Church, which occupied a portion of Building D from 2011 until 2017.[5] By the end of the 2021 academic year, the campus was completely vacant.[6] (Continued on page 9)

[1] "About Us / History," *San Mateo Union High School District,* https://www.smuhsd.org/Page/http%3A%2F%2Fwww.smuhsd.org%2Fsite%2Fdefault.aspx%3FPageID%3D2116, accessed May 31, 2022.
[2] "General Information / Crestmoor Information," *San Mateo Union High School District*, https://www.smuhsd.org/Page/13243, accessed June 3, 2022.
[2] Daniel Carlson, *Reusing America's Schools* (Washington, D.C.: Preservation Press, 1991), pp. 21-22.
[3] Ibid.
[4] City of San Bruno, Permit no. FC0608-0001, finaled August 16, 2006, https://etrakit.sanbrunocable.com/etrakit3/, accessed June 1, 2022.
[5] "Our Story," New North Church, accessed June 1, 2022, https://www.newnorth.church/get-to-know-us/our-story#content.
[6] Pivotal Step for Sale of Former Crestmoor High School," *San Mateo Daily Journal*, https://www.smdailyjournal.com/news/local/pivotal-step-for-sale-of-former-crestmoor-high-school/article_cb48801e-54ef-11e9-9174-b72d006028c9.html, accessed June 3, 2022.

B11. Additional Resource Attributes: N/A
***B12. References:** See page 13

B13. Remarks: None

***B14. Evaluator:** Johanna Kahn / ESA
***Date of Evaluation:** June 2022

(This space reserved for official comments.)

(Sketch Map with north arrow required.)



Source: San Mateo County Assessor

P3a. Description (continued):

Exterior

300 Piedmont Avenue is improved with the Minimalist-style complex formerly known as Crestmoor High School which was constructed in 1961-62 to serve the San Mateo Union High School District. The complex consists of six rectangular-plan building modules connected by a common roof structure, arranged around two off-set interior courtyards. Five building modules (Buildings A, B, C, D, and E) contain classrooms and offices. One building module (Building F) contains three former gymnasiums and associated spaces. The northern courtyard is fully occupied by two swimming pools. The southern courtyard contains a raised concrete platform, benches, and minimal landscaping. The connected building modules are arranged on an off-set grid that forms an irregular overall footprint. Buildings A, B, C, and E enclose the landscaped courtyard. Buildings B, D, E, and F enclose the courtyard with swimming pools. (The courtyards are described below.)

Buildings A, B, C, D, and E are constructed of steel-frame curtain walls. The steel frame is exposed on the exterior, and the glazed curtain walls are slightly recessed, a detail that emphasizes the non-load-bearing nature of the building envelope. The curtain walls consist of a tripartite vertical arrangement of aluminum-frame openings: an opaque, metal panel above; a large, central fixed window in the center; and a shallow panel containing either a louvered vent or a second opaque metal panel at the base. Many of the windows are covered with reflective tint (**Figure 1**). Some windows are covered with plywood to provide additional security. All six building modules are capped one shared, flat roof that serves to both enclose each module and connect the modules to form a unified plan. The spaces between the building modules are enclosed by banks of aluminum-frame system of glazed doors and transoms above that is similar to the curtain wall system. The roof overhangs each building module where it faces the interior courtyards, creating covered exterior circulation corridors (**Figure 2**).

The site slopes down to the north, creating variations in topography that are reflected in the building modules. Buildings A, B, and C are one story in height, while Buildings D, E, and F are two stories in height. Buildings D and E feature wrap-around aluminum-frame balconies at the second floor that face Courtland Drive and the surrounding parking lots. Building F contains double-height interior spaces, And this is reflected on the exterior by an absence of balconies or other notable features. Building F is predominately clad in opaque metal panels within an aluminum-frame grid.



Figure 1 - Main entrance between Building A and Building B, view facing northwest.
Source: ESA, 2022.



Figure 2 – Typical covered outdoor corridor adjacent to a courtyard. Source: ESA, 2022.

Interior

Buildings B, C, D, and E are square in plan, and each features a central, square- interior courtyard. These building modules each contain two east-west-oriented hallways located in the northern and southern thirds of the modules. This allows for each rows of classrooms located around the perimeters to have at least one wall of exterior windows. Additionally, each building module contains a series of rooms that are accessed from the east-west-oriented hallways and feature a wall facing the interior courtyard. It is assumed that the original layout of classrooms provided for natural light in each room; however, many rooms have been subdivided for other purposes. At this writing, some rooms no longer have access to natural light.

Building A is a modified version of the floor plan of the other building modules. It is rectangular in plan, with two square interior courtyards located at the north-south midline of building. On the interior, there are three north-south-oriented hallways: one each near the east and west ends of the building and one bisecting the building. This central hallway forms the centerline of the grouping formed by Buildings A, B, C, and E. It is this grouping that originally served as the main educational spaces for Crestmoor High School. Building F contains three double-height spaces originally used as gymnasiums. It does not contain central hallways or skylights.

The steel frame and curtain wall construction allows for maximum flexibility of the interior room layouts and placements. While most rooms are aligned, with regular-sized spaces arranged in a logical grid, the double-loaded corridors feature walls that undulate (**Figure 3**). This unusual feature is found in Buildings A, B, C, D, and E.

The southern courtyard is flat and at grade level. It contains a central, raised concrete platform enclosed by concrete planters and accessed by several sets of low-rise concrete stairs (**Figure 4**). Cork trees, integrated concrete benches, and faded paint on the ground for a basketball court and other recreational activities remain. Given the small size of the cafeteria, this courtyard appears to have served as the main dining and social space of Crestmoor High School.

The northern courtyard is at grade level, which is below the grade of the southern courtyard. The slope of the site in this area results in a courtyard enclosed by two-story buildings. The swimming pools are accessed from the lower levels of Buildings D and E or from the covered walkway along the southern façade of Building F. A set of concrete bleachers is built into the southern wall of the courtyard and is accessed from the walkway along the northern side of Building B (**Figure 5**).



Figure 3 – Interior view of a corridor in Building A with undulating walls and skylights.| Source: ESA, 2022.



Figure 4 – Southern courtyard, view facing south. Source: ESA, 2022.



Figure 5 – Northern courtyard, view facing south.
Source: ESA, 2022.

Surrounding Area

The Project site is located in the city of San Bruno, California, between Interstate 280 and State Route 35, and is adjacent to the Crestmoor Park residential subdivision. The site slopes slightly to the north and overlooks a steep grade change to the east. This once wooded and hilly section of San Bruno was first developed in the 1950s. At that time, the single-family Crestmoor Park subdivision was completed. Interstate 280 (Junipero Serra Freeway) was constructed along the eastern portion of the Project site in 1955. Today, the surrounding area is characterized as predominantly residential, and the San Bruno Chinese Church is located across Courtland Drive from the track and field recreational area associated with the Property located at the north end of the campus.

Site History and Construction Chronology

Around 1853, Alfred Green established a dairy in what would eventually become the City of San Bruno.[7] Numerous members of Green's extended family also settled the land and were joined by a few other settlers during the 19th century. The area remained largely undeveloped and devoid of dense settlement, and apart from dairy and ranching operations, transportation was the main economic driver for the area. During this time, the subject property was part of the Buri Buri Rancho that was eventually subdivided and sold to multiple landowners. During the early 1900s, the land was primarily used for raising cattle and other agricultural purposes,[8] and most residential and commercial development in San Bruno was located to east along El Camino Real.[9]

The advent of World War II brought major changes to the small community. Like many other parts of the peninsula, the government transformed large areas of farmland and other undeveloped land for use as barracks, training grounds, and military support infrastructure. This growth was augmented by the increasing importance of the San Francisco Municipal Airport, which was established in 1927 and eventually became the San Francisco International Airport. Proximity to the airfield made San Bruno a desirable location for military planners, and the city once built a Japanese-American internment camp at the Tanforan Racetrack and the U.S. Army's Western Region Advance Personnel Depot on lands immediately west of the racetrack.

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7 Mark Still, "From Gold Rush to Great War," *La Peninsula: The Journal of the San Mateo County Historical Association* 42, no. 2 (Summer 2014), p. 8.

8 Frank M. Stanger, "A California Rancho under Three Flags: A History of Rancho Buri Buri in San Mateo," *The California Historical Society Quarterly* 17, no. 3 (September 1938), pp. 245–59.

9 ESA, *SFO Noise Insulation Program, 2020 Grant Group 1: Cultural Resources Survey Report*, prepared for FAA and San Francisco International Airport, (January 2022), pp. 19-21.

During this time, the former farmland west of El Camino Real was subdivided. Between 1940 and 1960, the population of San Bruno grew from 6,500 to 29,000, which increased to 36,000 by 1970.[10] It is during this period of substantial postwar development that Interstate 280 was constructed and the area around the subject property was subdivided. The land immediately to the west of the subject property was purchased by developer George Williams, who established the Crestmoor Park residential subdivision in the early 1950s.[11] The increasing development of the city led to the need for additional schools to be built to accommodate the growth in the student population and to relieve the congestion at Capuchino High School and Mills High School.

At that time, the San Mateo Union High School District faced an overabundance of students and needed to construct "five more high schools in relatively quick succession: Capuchino, Hillsdale, Mills, Aragon[,] and Crestmoor."[12] Crestmoor High School was designed by architect John Lyon Reid and built in 1961-62 by general contractor Williams and Burrows, Inc.,[13] and it officially opened on September 5, 1962 (**Figure 7 and Figure 8**). The design was reported to be "similar to Mills and Hillsdale highs [also designed by Reid] in the interior [and] will have a capacity of 1,750 students."[14] Additionally, the school featured an "ultra-modern language laboratory which alone cost $6,145.46."[15] This and other features of the new high school were described by John Christgau who coached the school's first varsity basketball team: [16]

> *The opening of the brand-new, $4 million Crestmoor High School after just two years of construction was...amazing and miraculous.*
>
> *At first, everybody in the community was excited [by its opening]. The angled corridors, the white-tile floors, and the I-beam construction gave the school an orderly, efficient look...*
>
> *Crestmoor High was a powerhouse in the making. The modern language lab had glass study carrels with earphones for listening to language lessons. The science labs and the art wing had panoramic views of the entire bay. The modular walls meant that classrooms could mutate like huge cells. The little theater had upholstered cushion seats and a sound and light control room for the stage crew.*
>
> *There were two swimming pools in the center of the school, giving the campus the look of a country club.*

[10] City of San Bruno, San Mateo County, *Bay Area Census*, 1950, 1960, 1970, www.bayareacensus.ca.gov/cities/San Bruno.htm, accessed June 1, 2022.

[11] "Crestmoor," *Burlingame Properties*, https://burlingameproperties.com/neighborhoods/crestmoor, accessed June 3, 2022.

[12] "General Information / History of Our District," *San Mateo Union High School District*, https://www.smuhsd.org/Page/3621, accessed June 3, 2022.

[13] "Crestmoor Bid Won by Williams, Burrows Firm," *San Mateo Times*, May 26, 1961, sec. 2, p. 8.

[14] "Bonds Sought for Crestmoor High School," *San Mateo Times,* May 20, 1960, sec. 2, p. 1.

[15] "Crestmoor Officially Completed," *San Mateo Times,* November 13, 1962, sec. 2, p. 4.

[16] John Christgau, Michael and the Whiz Kids: A Story of Basketball, Race, and Suburbia in the 1960s (Lincoln, NE: University of Nebraska Press, 2013), p. 21.

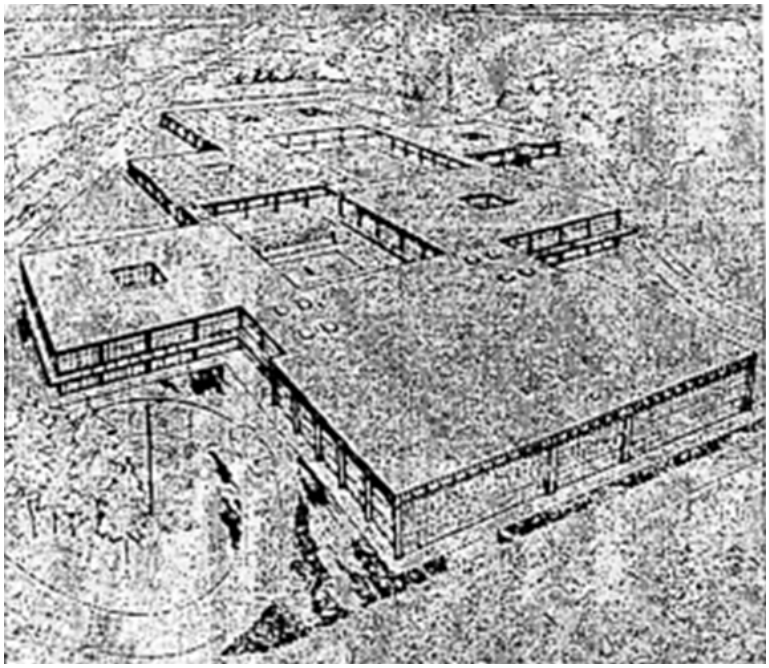


Figure 6 - Architect's rendering of Crestmoor High School. Building F is in the foreground. Source: San Mateo Times, August 23 1962.



Figure 7 – Aerial photograph of Crestmoor High School, 1965. Source Framefinder, Flight IC CAS-65-130.

Despite its initial warm reception, Crestmoor High School "faced a steep enrollment decline," and it was permanently closed in 1980 .[17] Building A was reopened in 1980 as Peninsula High School, a continuation school. By 1990, the campus was known as the Pen/Crest Center,[18] a "mixed educational, business, nonprofit, mega-courtroom, and recreation center" that, at one time, was occupied by 58 different tenants including Peninsula High School.[19]

By 1991, Building F was converted for use by the San Mateo County Superior Court, and the auditorium was upgraded to support a state-of-the-art courtroom in the early 1990s.[20] In 2006, a room was added to the Crayon College Preschool,[21] which occupied Building E. No other completed building permits are on file at the City of San Bruno. A review of historic aerial photographs indicates that the subject property very closely resembles its original design. There have been no significant additions or alterations, and the site plan is substantially intact.

B10. Significance (continued):

Design Professionals

For the purposes of historic resource evaluations, architects and landscape architects are typically considered to be the design professionals associated with a building or development. Depending on the situation, the engineer may also be considered to be a design professional. Contractors (which are identified above under the Site History and Construction Chronology) are generally not considered to be design professionals.

Architect

The design of 300 Piedmont Avenue is attributed to master architect John Lyon Reid (1906-82) and his firm Reid, Rockwell, Banwell & Tarics. Reid received his architectural training at the University of California Berkeley and the Massachusetts Institute of Technology (MIT). He also taught architecture at MIT from 1932 to 1946. Beginning in 1946, he was a partner in the California architecture firm Bamberger & Reid which later became Reid, Rockwell, Banwell & Tarics and was known as Reid & Tarics Associates after 1962.[22]

Crestmoor High School was the last of four stylistically similar, Minimalist-style high school campuses designed by Reid for the San Mateo Union High School District.[23] The first was Hillsdale High School (extant; 3115 Del Monte Street in San Mateo), which opened in 1955 and received an honor award from the American Institute of Architects (AIA) in 1956. The successful design of this building was used as a precedent for later high schools (**Figure 8**), including Mills High School which opened in 1958 (extant; 400 Murchison Drive in Millbrae) and Aragon High School which opened in 1960 (extant; 900 Alameda de las Pulgas in San Mateo).[24] Bay Area architectural historian Susan Dinkelspiel Cerny described the shared design principle of Hillsdale, Mills, Aragon, and Crestmoor high schools as follows:

> *Within the four [stylistically similar high schools], the geometric rigor of the Vierendal [sic] I-beam frames with large gray panels perfectly reflects American thought regarding postwar techno-optimism—technology could solve the world's problems, society would be totally rationalized, and schools would become factories mass-producing educated citizens—ideas many now find strangely quaint in this post-modern age.*[25]

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17 "General Information / History of Our District," *San Mateo Union High School District*, https://www.smuhsd.org/Page/3621, accessed June 3, 2022.

18 "Safeco Insurance Company of America, et al. v. Roxani Gillespie, B063893," *California Court of Appeal, Second Appellate District, Records and Briefs,* Exhibit A, p. 2, https://www.google.com/books/edition/California_Court_of_Appeal_2nd_Appellate/Uv_ cSCQtXL8C?hl=en&gbpv=0, accessed June 1, 2022.

19 Daniel Carlson, *Reusing America's Schools* (Washington, D.C.: Preservation Press, 1991), pp. 19, 21.

20 *Memoirs: Brobeck, Phleger & Harrison LLP, Attorneys at Law*, 1926-1996 (San Francisco, CA: Brobeck, Phleger & Harrison, 1996), p. 65.

21 City of San Bruno, Permit no. FC0608-0001, finaled August 16, 2006, https://etrakit.sanbrunocable.com/etrakit3/, accessed June 1, 2022.

22 "John Lyon Reid, FAIA" (obituary), *AIA Journal* 17, no. 14 (December 1982), p. 80.

23 Susan Dinkelspiel Cerny and Beth A. Armstrong, *An Architectural Guidebook to San Francisco and the Bay Area* (Salt Lake City, UT: Gibbs Smith, 2007), p. 147.

24 Ibid..

25 Ibid.



Figure 8 – Aerial view of Hillsdale High School, facing southeast.
Source: Google Maps, 2022

Other project completed by Reid's firm include a chapel at the Robert Louis Stevenson School for Boys in Pebble Beach (for which he won an AIA honor award in 1965), industrial facilities for the U.S. Navy at Mare Island, the advanced isotope separation facility at the Lawrence Laboratory in Livermore, several buildings at the UC San Francisco Parnassus Campus in San Francisco (for one of which he won an AIA honor award in 1967) , and the applied sciences building at UC Santa Cruz.[26] In 1962, Reid was awarded the Medal of Honor for Distinction in Architecture at Rice University for his contributions to education and architecture. Over the course of his 36-year career, Reid designed more than 700 schools and university buildings in California and beyond.[27]

Public School Design in the Mid-20th Century

The massive population increase in California following World War II was the result of the baby boom (from the mid-1940s to the early 1960s) and an influx of new residents from other parts of the United States. By 1962, California had become the most populous state in the country. As residential and commercial development and expanded infrastructure were accelerated to meet the increasing demand, cities and suburbs expanded at a remarkable rate. Enormous pressure was put on education facilities to expand as the baby boomers reached school age.

Part of the response to the dramatic shortage of public schools and classroom space was a standardization of ideas about school design across the country. This new uniformity was facilitated through the creation of organizations, journals, and guidebooks dedicated to developing and disseminating ideas on school design. The type of school advocated for featured a contemporary design with a decentralized plan, low massing, indoor/outdoor space, natural light and ventilation, and an informal character. Pre-fabricated and modular elements also became popular and economic design choices in the post-war years, adding to the sense of uniformity in school design throughout a school district.

After the construction hiatus caused by World War II, the International Style, as pioneered by European architects Richard Neutra and Ludwig Mies van der Rohe, was adopted for many new schools (and other types of buildings) being constructed across America. Often unornamented and austere, International-style schools were sometimes called "learning factories." The individual, architect-designed schools of the pre-war era gave way to a period of post-war school design that reflected school district-level planning control and a nationwide trend toward standardization. The 1950s and 1960s saw the rise of predominantly one-story, open-plan public schools throughout California. A single story eliminated the need for extra corridors and stairwells and could be expanded through the addition of new wings, separate structures, or portable classrooms. Many new schools were necessarily located in suburban areas, where expanding horizontally was a viable option.[28] Indeed, John Lyon Reid's award-winning design for

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26 "John Lyon Reid," *Pacific Coast Architecture Database,* accessed June 1, 2022, https://pcad.lib.washington.edu/person/399/.

27 "John Lyon Reid, FAIA" (obituary), *AIA Journal* 17, no. 14 (December 1982), p. 80.

28 Sapphos Environmental, Inc., *Los Angeles Unified School District: Historic Context Statement 1870 to 1969*, March 2014, p. 114.

Hillsdale High School in San Mateo was described as one that would "shelter with grace the known program of the present, the unknown programs of the future, and change which is the sure aspect of secondary education. This original premise has been carried successfully to the finished building by allowing for convertibility."[29]

These schools were generally constructed where land was plentiful and are characterized by sprawling, low-profile buildings or clusters of buildings connected by covered walkways and possessing individual patios or open courtyards, encouraging air circulation and taking maximum advantage of the California climate. One-story buildings also substantially reduced the overall superstructure and consequent earthquake and fire risk, as access to the outdoors was readily available. Elementary schools were primarily designed to be one story in height, and high schools were commonly designed to be one or two stories in height.

Minimalist Style, 1920 – Present

The Minimalist Style is a subset of Modernism, a movement that evolved as a reaction to the excessive ornament commonly used in the late 19th century. Originating in the post-World War I period, the Minimalist Style emerged from the De Stijl and Bauhaus movements of the 1920s and was also influenced by traditional Japanese architecture. The Minimalist Style emphasizes the use of simple design elements without ornamentation or decoration, reducing elements down to their essential forms. While the movement traces its origins to the early 20th century, the aesthetic became most popular during the 1960s through the 1980s.[30]

Character-defining features of the Minimalist Style include:

- Pure geometric forms; primarily rectilinear;
- Simple/plain materials in limited quantities;
- Neat and orderly arrangement of components;
- Repetition of details, finishes, fenestration, etc.; and
- Well-defined, uninterrupted lines.

Significance Evaluation

The City of San Bruno does not maintain a historic resource register and does not currently have a set of local criteria to apply to the evaluation of potential historic resources. The following section provides the evaluation of individual historic significance for the subject property based on the pedestrian survey and research provided above, following California Register Criteria 1 through 4.

Criterion 1: Association with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States

Archival research indicates that the construction of the subject property reflects typical suburban development in the Crestmoor Park neighborhood of San Bruno in the early 1960s, and it does not appear to possess any unique significance for this association. It was constructed to address increased public school enrollment following the baby boom in the post-World War II years. As such, it follows trends and events that were common throughout California, especially in the San Francisco Bay Area from the 1950s through the 1970s. There is no evidence to suggest that the subject property is associated with any particular events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States. For this reason, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 1.

Criterion 2: Association with the lives of persons important to local, California, or national history

The subject property was originally constructed as Crestmoor High School, which operated from 1962 to 1980. During that time, it was attended by numerous teachers and administrators and thousands of students. Since the 1980s, the subject property has been occupied by dozens of tenants, notably the Peninsula High School, San Mateo County Superior Court, and a variety of commercial, nonprofit, and religious organizations. Archival research did not identify any individuals who may be significantly associated with Crestmoor High School or any of the subsequent tenants. For this reason, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 2.

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29 C. Herbert Paseur, "Flexibility in School Design or the Ancient King and His Three Wise Architects," *AIA Journal* 32, no. 5 (November 1959), p. 94.

30 Stewart, Jessica. 2018. What is Minimalism? Learn the Intricacies and History of this Influential Aesthetic, *https://mymodernmet.com/what-is-minimalism-definition*, accessed June 1, 2022.

Criterion 3: Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values

From the mid-1950s to the early 1960s, architect John Lyon Reid designed four stylistically similar high school campuses for the San Mateo Union High School District. The first was Hillsdale High School in San Mateo, which was designed in 1955. The second and third were Mills High School in Millbrae and Aragon High School in San Mateo, which were designed in 1958 and 1960, respectively. The last of the four campuses to be designed and built was Crestmoor High School, which occupied the subject property from 1962 to 1980. Whereas all four campuses are extant, only the first three continue to operate as public high schools in 2022.

Reid was a prominent California architect whose career spanned nearly four decades, during which time he designed more than 700 schools and university buildings. Several of his educational designs received honor awards from the AIA, the first of which was his design for Hillsdale High School in 1956. Other honor award recipients that year represented the "who's who" of American architects including Philip Johnson; Wurster, Bernardi & Emmons; and Skidmore, Owings & Merrill.[31] Reid qualifies as a master architect.

As one of four stylistically similarly high school campuses designed by Reid in San Mateo County, the former Crestmoor High School certainly embodies distinctive characteristics of mid-century Minimalist-style public school architecture. However, to be eligible under Criterion 3 "as a specimen of its type or period of construction [it must be] an important example (within its context) of building practices of a particular time in history."[32] Of the Reid-designed public high schools in San Mateo County, Crestmoor High School was the last to be built. When compared with Hillsdale High School, the first to be designed and the only recipient of a national design award, Crestmoor High School exhibits some similarities: it employs similar materials, one-story massing, flat roofs, and connected buildings organized around a central courtyard. However, the design of Hillsdale High School, which predated Crestmoor High School by seven years, was considered to be avant-garde and a reflection of national trends in public school design. Within this context, the former Crestmoor High School does not appear to rise to a level of significance as a property that embodies distinctive characteristics of a type, period, or method of construction. Similarly, as compared to other designs by Reid, it does not possess high artistic value because it does not express an aesthetic ideal or design concept more fully than other properties of its type.[33]

As stated above, John Lyon Reid is considered to be a master architect. To be eligible for listing under Criterion 3 as the work of a master, "the property must express a particular phase in the development of the master's career, an aspect of his or her work, or a particular idea or theme in his or her craft. A property is not eligible as the work of a master, however, simply because it was designed by a prominent architect."[34] For the same reasons presented above, the subject property does not appear to rise to a level of significance as the work of Reid.

For these reasons, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 3.

Criterion 4: Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation

Because the subject building is an example of a common construction type (i.e., public high school) built using readily available materials (e.g., steel beams and glass) and designed in the common mid-century Minimalist Style, it has little to no potential to yield information important to the prehistory or history of the local area, California, or the nation. Therefore, 300 Piedmont Avenue does not appear to be individually eligible for listing under Criterion 4.

Integrity

A property must also retain sufficient integrity to convey its historical significance in order to be considered a historical property and/or historical resource. The California Register defines integrity as the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. As 300 Piedmont Avenue does not appear to be individually significant under any California Register criteria, a discussion of integrity is not applicable.

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31 "News Bulletins," *Progressive Architecture* 37, no. 4 (April 1956), pp. 90-91.

32 California Register criteria are modeled closely after National Register criteria. National Park Service, *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*, 1997, p. 18, https://www.nps.gov/subjects/nationalregister/upload/NRB-15_web508.pdf, accessed June 1, 2022.

33 Ibid., p. 20.

34 Ibid.

Conclusion

Based on a site survey, archival research, and the analysis presented in this memo, ESA recommends the building at 300 Piedmont Avenue as ineligible for individual listing in the California Register under any criteria. Additionally, the City of San Bruno does not maintain a city-wide historic resource inventory, nor is a local historic preservation ordinance currently in effect. As such, 300 Piedmont Avenue would not be considered a historical resource for the purposes of CEQA.

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Appendix E

Final Geotechnical and Geological Investigation

ROCKRIDGE GEOTECHNICAL

Prepared for **SummerHill Homes**

FINAL GEOTECHNICAL AND GEOLOGICAL INVESTIGATION (REVISION 1) PROPOSED RESIDENTIAL DEVELOPMENT 300 PIEDMONT AVENUE SAN BRUNO, CALIFORNIA

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September 21, 2023
Project No. 22-2164

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ROCKRIDGE GEOTECHNICAL

September 21, 2023
Project No. 22-2164

Ms. Elaine Breeze
SummerHill Homes
777 S. California Avenue
Palo Alto, California 94304

Subject: Final Geotechnical and Geological Investigation (Revision 1)
Proposed Residential Subdivision
300 Piedmont Avenue
San Bruno, California

Dear Ms. Breeze:

We are pleased to present our final geotechnical investigation report for the proposed residential development to be constructed at 300 Piedmont Avenue in San Bruno, California. Our geotechnical investigation was performed in accordance with our proposal dated April 4, 2023 and our Contract Amendment #47101000-003, dated May 23, 2023, with SummerHill Homes.

The project site encompasses an area of approximately 40.2 acres. The site has substantial grade change, including slopes on the western and southern portions of the site with approximately 100 feet of elevation change. The area of proposed development has a grade change of approximately 44 feet, with the northern portion at Elevation 376 feet and the southern portion at Elevation 420 feet (NAVD88). It is bordered by residential properties to the north, west, and south, and by a slope, church, telecommunication facilities, and Interstate 280 to the east. The site is currently occupied by six attached two-story educational buildings, surrounding two courtyards. The lot site also includes a storage lot, parking lot, and two fields. The parcel includes Courtland Drive, which runs north-south along the eastern portion of the lot.

Plans are to construct 155 at-grade single-family two-story residences. Plans include low retaining walls where sloped grading is not possible. Site grading will include a maximum of approximately 12-foot cuts and 6-foot fills. Additional site improvements include a 36,000-square-foot C-3 development, a soccer/park area, and private roadways.

From a geotechnical standpoint, we conclude the site can be developed as planned, provided the recommendations presented in this report are incorporated into the project plans and specifications and implemented during construction. The primary geotechnical concern at the site is providing uniform support for the foundations for the proposed buildings. We conclude the proposed residential buildings should be supported on shallow stiffened foundations, such as a grid system of interconnected footings (i.e., a “grid” foundation), a post-tensioned slab-on-grade (P-T slab), or a conventionally reinforced mat foundation.

The recommendations contained in our report are based on limited subsurface exploration. Consequently, variations between expected and actual subsurface conditions may be found in localized areas during construction. Therefore, we should be engaged to observe site preparation, excavation, and foundation installation, during which time we may make changes to our recommendations if deemed necessary.

We appreciate the opportunity to provide our services to you on this project. If you have any questions, please call.

Sincerely yours,
ROCKRIDGE GEOTECHNICAL, INC.





Craig S. Shields, P.E., G.E.
Principal Engineer

Eric W. Ford, M.S., P.G.
Professional Geologist

QUALITY CONTROL REVIEWER:

Linda H.J. Liang, P.E., G.E.
Principal Engineer

Enclosure

ROCKRIDGE GEOTECHNICAL

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ROCKRIDGE GEOTECHNICAL

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ROCKRIDGE GEOTECHNICAL

FINAL GEOTECHNICAL AND GEOLOGICAL INVESTIGATION (REVISION 1)
PROPOSED RESIDENTIAL DEVELOPMENT
300 PIEDMONT AVENUE
San Bruno, California

1.0 INTRODUCTION

This report presents the results of the final geotechnical and geological investigation performed by Rockridge Geotechnical, Inc. for the proposed residential development to be constructed at 300 Piedmont Avenue in San Bruno, California. The project site is on the western side of Courtland Drive, north of its intersection with Madison Avenue, as shown on the Site Location Map, Figure 1. We previously performed a preliminary geotechnical and geological investigation for this project, the results of which were presented in our report dated August 11, 2022.

The project site encompasses an area of approximately 40.2 acres. The site has substantial grade change, including slopes on the western and southern portions of the site with approximately 100 feet of elevation change. The area of proposed development has a grade change of approximately 44 feet, with the northern portion at Elevation 376 feet and the southern portion at Elevation 420 feet (NAVD88). It is bordered by residential properties to the north, west, and south, and by a slope, a church, telecommunications facilities, and Interstate 280 to the east. The site is currently occupied by six attached two-story educational buildings surrounding two courtyards. The site also includes a storage lot, parking lots, and two recreation fields. The parcel also includes Courtland Drive, which runs north-south along the eastern portion of the lot. A site plan showing the existing condition is presented on Figure 2a.

Current plans are to construct 155 at-grade single-family two-story residences. Plans include retaining walls up to about 6 feet high where sloped grading is not possible. Site grading will include a maximum of approximately 12-foot cuts and 6-foot fills. Additional site improvements include a 36,000-square-foot C-3 development, a soccer/park area, private roadways, and lined bio-retention areas. A site plan showing the proposed retaining walls and remedial grading is presented on Figure 2b.

2.0 SCOPE OF SERVICES

Our geotechnical services were performed in accordance with our final geotechnical investigation proposal dated April 4, 2023. Our scope of services consisted of: 1) reviewing available geologic and geotechnical data, 2) supplementing our previous subsurface investigation by drilling six additional test borings, hand-excavating five test pits, and performing six dynamic penetrometer tests (DPTs), 3) performing laboratory testing on selected soil samples, 4) performing a detailed geologic reconnaissance and mapping of the property, and 5) performing engineering analyses to develop conclusions and recommendations regarding:

- subsurface conditions at the site, including delineating areas that were previously filled during the original site grading
- site seismicity and seismic hazards
- stability of existing slopes under static and seismic conditions
- the most appropriate foundation type(s) for the proposed residences
- design criteria for the recommended foundation type(s), including vertical and lateral capacities
- estimates of foundation settlement
- foundation setback from the top of existing and proposed slopes
- design parameters for retaining walls, including geogrid-reinforced concrete-block walls
- site grading and fill placement, including inclinations of permanent cut and fill slopes
- asphalt concrete and Portland-cement concrete pavement sections
- 2022 California Building Code (CBC) site class and design spectral response acceleration parameters
- corrosivity of the near-surface soil and the potential effects on buried concrete and metal structures and foundations
- construction considerations.

3.0 FIELD INVESTIGATIONS AND LABORATORY TESTING

The following sections present a summary of the previous and current field investigations and laboratory testing we performed to evaluate the geotechnical and geological conditions at the site. Because the slopes on and adjacent to the site are mapped as susceptible to earthquake-induced slope instability, we performed our investigations in accordance with Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California* (California Geological Survey, 2008).

On July 11 and 18, 2023, Eric W. Ford, P.G., a registered geologist retained by our firm, performed a geologic reconnaissance of the site to visually identify any geologic hazards, including landslide hazards, and reviewed historic aerial photographs of the site. In addition, Mr. Ford logged five test pits that were hand-excavated near the top of the eastern and western slopes. The results of Mr. Ford's reconnaissance are presented in Sections 4.0 and 5.2 of this report.

3.1 Previous Test Borings and Laboratory Testing by Cleary Consultants

Cleary Consultants, Inc. previously performed a preliminary geotechnical feasibility investigation at the site for the San Mateo Union High School District, the results of which were presented in a report titled *Preliminary Geotechnical Feasibility Investigation, Peninsula High School, (APN 019-170-020), 300 Piedmont Avenue, San Bruno, California*, dated May 4, 2020.

The preliminary geotechnical investigation by Cleary Consultants consisted of drilling nine exploratory borings, designated as EB-1 through EB-9, on February 25 and 26, 2020. The borings were drilled using truck-mounted hollow-stem auger equipment. The approximate boring locations are shown on Figure 2a. The borings were drilled to depths of approximately 9 to 50 feet below the existing ground surface (bgs). In the laboratory, selected soil samples were tested to measure moisture content, dry density, fines content, free swell, Atterberg limits, and corrosivity. The boring logs, classification chart, and laboratory test results from the Cleary Consultants investigation are included in Appendix C of this report.

3.2 Previous Test Borings and Laboratory Testing by Rockridge Geotechnical

The preliminary geotechnical and geological investigation we performed in 2022 included drilling six test borings and performing corrosivity testing on samples of near-surface soil. The test borings, designated as RG-1 through RG-6, were drilled on February 2 and 3, 2022 by Exploration Geoservices, Inc. of San Jose, California at the approximate locations shown on Figure 2a. The borings were drilled to depths of 30.5 to 50.5 feet bgs using a Mobile B-61 drill rig equipped with 8-inch-diameter hollow-stem augers. During drilling, our field geologist logged the soil encountered and obtained representative samples for visual classification and laboratory testing. The logs of the borings are presented on Figures A-1 through A-6b in Appendix A. The soil and bedrock encountered in the borings was classified in accordance with the classification system presented on Figures A-23 and A-24.

Soil samples were obtained using the following samplers:

- Modified California (MC) split-barrel sampler with a 3.0-inch outside diameter and 2.5-inch inside diameter, lined with 2.43-inch inside diameter tubes.
- Standard Penetration Test (SPT) split-barrel sampler with a 2.0-inch outside and 1.5-inch inside diameter; the sampler can accommodate liners, but liners were not used.

The MC and SPT samplers were driven with a 140-pound, down-hole safety hammer falling 30 inches per drop. The samplers were driven 18 inches and the hammer blows required to drive the samplers were recorded every 6 inches and are presented on the boring logs. A “blow count” is defined as the number of hammer blows per 6 inches of penetration or 50 blows for 6 inches or less of penetration. The blow counts required to drive the MC and SPT samplers were converted to approximate SPT N-values using factors of 0.63 and 1.1 respectively, to account for sampler type and approximate hammer energy. The blow counts used for this conversion were: (1) the last two blow counts if the sampler was driven more than 12 inches, (2) the last one blow count if the sampler was driven more than 6 inches but less than 12 inches, and (3) the only blow count if the sampler was driven 6 inches or less. The converted SPT N-values are presented on the boring logs.

Upon completion, the borings were backfilled with neat cement grout. The soil cuttings from the borings were removed from the site and disposed of at a landfill as clean fill.

We re-examined each soil and bedrock sample obtained from our borings to confirm the field classifications and selected representative samples for laboratory testing. Two near-surface soil samples were tested to measure corrosivity. The results of the corrosivity tests are presented in Appendix B.

3.3 Supplemental Test Borings

To supplement the subsurface data from the previous investigation, six additional test borings (designated as RG-7 through RG-12) were drilled on June 27 through 29, 2023 by Exploration Geoservices, Inc. at the approximate locations shown on Figure 2a. The borings were drilled to depths of 35.5 to 39 feet bgs using Mobile B-61 and Mobile B-40 drill rigs equipped with 8-inch-diameter hollow-stem augers. During drilling, our field engineer logged the soil encountered and obtained representative samples for visual classification and laboratory testing. The logs of the borings are presented on Figures A-7a through A-12b in Appendix A. The soil and bedrock encountered in the borings were classified in accordance with the classification systems presented on Figures A-23 and A-24.

Soil samples were obtained using the MC split-barrel sampler. The MC sampler was driven with a 140-pound, down-hole safety hammer falling 30 inches per drop. The sampler was driven 18 inches and the hammer blows required to drive the sampler were recorded every 6 inches and are presented on the boring logs. A “blow count” is defined as the number of hammer blows per 6 inches of penetration or 50 blows for 6 inches or less of penetration. The blow counts required to drive the MC sampler were converted to approximate SPT N-values using factor of 0.63 to account for sampler type and approximate hammer energy. The blow counts used for this conversion were: (1) the last two blow counts if the sampler was driven more than 12 inches, (2) the last one blow count if the sampler was driven more than 6 inches but less than 12 inches, and (3) the only blow count if the sampler was driven 6 inches or less. The converted SPT N-values are presented on the boring logs.

Upon completion, the borings were backfilled with neat cement grout. The soil cuttings from the borings were spread on the ground surface near the boring locations.

3.4 Dynamic Penetrometer Tests

To qualitatively evaluate the strength of the soil on the slopes and provide information regarding the depth to bedrock, we performed six dynamic penetrometer tests (DPTs), designated as DPT-1 through DPT-6, on July 18, 2023 at the approximate locations shown on Figure 2a. The DPTs were advanced to practical refusal in bedrock, defined as more than 50 blows per 10-centimeter interval, at depths ranging from approximately 1.3 to 8 feet bgs.

The DPTs were performed following the methodology presented in the technical paper titled *A Portable Dynamic Penetrometer for Geotechnical Investigations*, prepared by J.R. Triggs and P.D. Simpson (Triggs & Simpson, 1990). The DPTs consisted of manually driving a 1.4-inch-diameter, cone-tipped probe with a 35-pound hammer falling 15 inches. The blow counts required to drive the probe were recorded at 10-centimeter intervals and converted to SPT N-values for use in our engineering analyses. The results of DPT-1 through DPT-6 are presented in Figures A-13 through A-18 in Appendix A.

3.5 Test Pits

Subsurface conditions on the slopes adjacent to the site were further explored by hand-excavating five test pits, designated as TP-1 through TP-5, on July 18, 2023 at the approximate locations shown on Figure 2a. The test pits were excavated to depths ranging from approximately 4 to 5 feet bgs. Soil and bedrock exposed in the test pits were logged by Eric W. Ford, P.G. and representative soil samples were collected. The subsurface conditions encountered in the test pits are presented on Figures A-19 through A-23 in Appendix A.

3.6 Laboratory Testing

We re-examined the soil and bedrock samples obtained from our borings and test pits to confirm the field classifications and selected representative samples for laboratory testing. To evaluate

the geotechnical properties, including shear strength of the existing fill and in-situ bedrock for our slope stability analyses, the following laboratory tests were performed:

- particle-size distribution
- Atterberg limits
- moisture content
- dry density
- maximum dry density and optimum moisture content (i.e., compaction curve)
- R-value
- unconsolidated-undrained triaxial compression
- direct shear
- soil corrosivity

The results of the laboratory tests are presented on the boring logs and in Appendix B.

4.0 REGIONAL AND SITE GEOLOGY

4.1 Regional Geology

The site is in the Coast Ranges Geomorphic Province of California that is characterized by rugged northwest-trending mountain chains, valleys, and ridges. The predominant geologic structure and these topographic features are controlled by folds and faults that resulted from the collision of the Farallon plate and North American plate and subsequent strike-slip faulting along the San Andreas Fault system. The San Andreas Fault is more than 600 miles long from Point Arena in the north to the Gulf of California in the south. The Coast Ranges Geomorphic Province is bounded on the east by the Great Valley and on the west by the Pacific Ocean.

The geologic structure in the area is dominated by the San Andreas and Serra faults. The Serra Fault extends from Hillborough to near Daly City. The fault lies approximately 0.9 miles to 1.9 miles northeast of the San Andreas Fault, and because it dips toward the San Andreas Fault, the two faults probably intersect at depth (Bonilla, 1998; Pampeyan, 1994).

The bedrock in the area is mapped as of Jurassic- to late Cretaceous-age [~200 – 65 million years ago (Ma)] Franciscan Complex consisting of sandstone, shale, chert, greenstone, and serpentinite and Upper Pliocene-age [5.3 -2.6 million years ago (Ma)] Merced Formation overlain by Quaternary-age (1.8 Ma to the present), Colma Formation, hill slope (colluvium), alluvium, landslide deposits and artificial fill (Pampeyan, 1994).

4.2 Site Geology

The available geologic maps of the area show the property lying predominately on the Merced Formation (Tme) with minor localized pockets of artificial fill (Qf) along the west, east, and north ends of the prominent north-northeast trending ridge that encompasses the site. The Merced Formation consists of moderately consolidated, but commonly friable, yellow- to gray-orange where weathered and blue-gray where fresh, thick-bedded to massive, fine-grained marine sandstone, siltstone, and clayey sandstone bedrock (Pampeyan, 1994). During our geologic reconnaissance, we observed friable, fossiliferous, brown-yellow silty sandstone (Merced Formation) in an outcrop in the upslope portion of the prominent cut in the southwestern corner of the site.

Based on our geologic reconnaissance, historic aerial photograph review, and the results of the test borings and test pits, we prepared a geologic map of the site, which is presented on Figure 2a. As shown, most of the site is blanketed by graded cut-and-fill terraces (Qg) with variable amount of fill placed during the original grading of the site. Thicker fills (Qf) were encountered around the edges of the site, including along the upper portion of the western slope. The DPT and test pit results indicate the existing fill on the slopes is generally less than 6 feet thick and well compacted below depths of 1 to 2 feet bgs. Bedrock of the Merced Formation is present at shallow depths on the slopes below the existing fill except for the slope wash/ravine fill which is mapped in the southwestern corner and at localized erosion gullies and shallow slope failures in various locations. A more significant erosion gully was observed on the sloping portion of the Caltrans property to the east (see Figure 2a). The gully appears to correspond to an area where fill was placed in the 1960’s for a 24-inch-diameter corrugated metal pipe that previously conveyed flow eastward toward Interstate 280.

Strike and dip symbols on the available published geologic maps suggest that the prominent north-northeast trending ridge is structurally characterized by north-northeast striking and steeply to vertical dipping beds that appear to be folded along the axis of the ridge. Furthermore, during our subsurface investigations, we measured strike and dip of bedding in sandstone within the prominent arcuate cut in the southern part of the property that was striking north-northeast and dipping between 59° and 69° to the east. During our subsurface investigation, we observed near vertical abrupt contacts of brown-yellow silty sandstone over dark gray silty sandstone and other structural indicators such as repeating and alternating strata units that suggest a north-northeast striking fold or folds encompassing the ridge underlying the site. Intensely deformed, steeply dipping strata and folding is likely a result of the proximity to and movement along the San Andreas and Serra faults, which are approximately 1,400 feet to the west and 410 feet to the east of the site, respectively.

Also, during our subsurface investigations at the site, we encountered up to about 16 feet of artificial fill overlying the bedrock across the site. The fill encountered in our borings was well compacted and was likely placed during the original grading of the site. The thickest accumulations of fill are in the topographically lower northwest part of the site along the margins or upper breaks-in-slope that wrap around the northern half of the site, and at the arcuate heads of prominent drainages that extend down from the prominent ridge in the west and east.

5.0 SITE AND SUBSURFACE CONDITIONS

5.1 Site Conditions

The site is located at the Peninsula High School (formerly Crestmoor High School) property that encompasses the top of a north-northeast trending ridgeline along Piedmont Avenue in San Bruno. The site is bordered to the east and southeast by the San Bruno Chinese Church, telecommunications facilities, and a slope that extends down to Highway 280. The north, west, and southwest sides of the property are bordered by subdivisions on Madison Avenue, Rosewood Drive, Keefe Court, Glenbrook Lane and Courtland Drive constructed in the mid-to late 1950s. The Peninsula High School (formerly Crestmoor High School) campus was constructed between 1960 and 1962.

Existing development on the property is generally located on relatively level and terraced pads, which increase in elevation from north to south. From north to south, these terraces consist of the lower field; upper field and equipment yard; the three-tiered northeastern parking lot; northwestern parking lot; Building F, lower portions of the split-level Buildings D and E, pool complex and bus loop; Buildings A, B and C, upper portions of split-level Building D and E, courtyard, and the west and southwest parking lots; and the southeastern parking lot. Based on the topographic plan of the property prepared by BKF Engineers dated January 16, 2019, these tiers lie at approximately elevations 376 to 379, 381 to 390, 390 to 396, 393, 400 to 402, 412 to 416, and 411 to 414 feet above Mean Sea Level, respectively. A fire lane extends along the northern, western, and southern sides of the campus building complex, connecting the northeast, west, and southwest parking lots, the bus loop, and Piedmont Avenue.

The lower and upper fields are separated by an approximately 4:1 to 5:1 (horizontal to vertical) north-facing slope, with an uncovered concrete-lined V-ditch located at the base. The upper field and northwest parking lot are separated by an approximately 4- to 5-foot-tall concrete retaining wall, and the northwest parking lot is separated from the fire lane on the north side of Building F by an approximately 3.5:1 north-facing slope above and an approximately 3-foot-tall concrete retaining wall. A gradual south-facing slope extends from the south face of Building D to the southeast parking lot, while the east-facing slope down to Piedmont Avenue is approximately 1.5:1.

The northern and western sides of the property are occupied by relatively steep approximately 1.75:1 to 2:1 (horizontal to vertical) north- and west-facing cut slopes leading down towards the adjacent subdivisions, and they were cut and graded prior to construction of the school campus. The upper few feet of these slopes contain gradients of up to 1:5 (horizontal to vertical) locally, are about 30 and 60 feet in elevation above Glenbrook Lane and Keefe Court respectively, and approximately 75 and 105 feet above Rosewood Drive and Madison Avenue, respectively.

The southwestern and southern portion of the property contains a deep cut into the ridge and slopes facing upwards from the fire lane and southwest parking lot to the south and southwest at approximately 2:1 (horizontal to vertical). Near the crest of the ridge, the slope steepens to 1.5:1

and is approximately 20 to 50 feet in elevation above the southern limits of the developed portion of the property.

The eastern and southeastern portion of the property slopes relatively steeply at 1:5 to 2:1 (horizontal to vertical) from Piedmont Avenue downward towards Interstate 280, except for the cut and graded bench on which the San Bruno Chinese Church is located.

The slopes surrounding the property are generally heavily vegetated, with thick brush and medium-to-tall, established trees. During our geologic investigation, some evidence of surficial slope erosion on the western side of the project was observed. Also, as further discussed below (see Section 5.2), historic aerial photographs from 2008 show plastic sheeting covering an area of previously documented surficial and/or shallow slope instability on the slope above the properties at 310 through 340 Madison Avenue, downslope of the developed portion of the Peninsula High School property. Evidence of shallow slope instability was also observed on the slope above properties 270 through 280 Madison Avenue during our recent geologic investigation.

Evidence of distress cracking in asphalt pavement within Courtland Drive and the access road that runs along the top of the western slope was observed during our recent geologic investigation. The observed cracking coincides with areas where fill was placed along the east- and west-facing slopes during the original grading of the school property in the early 1960's.

The irrigated grass sports fields and decomposed granite-paved track on the lower field were observed to be generally fair condition; however, the condition of existing asphaltic concrete pavements, interior and exterior concrete slabs-on-grade, retaining walls varies from fair to poor.

5.2 Aerial Photograph Review and Site History

The development history of the site was compiled by reviewing a series of historical vertical aerial photographs representing each decade since 1947. A list of the historic aerial photographs reviewed is presented below in Table 1. The following paragraphs provide a brief chronology of site development.

The earliest vertical aerial photographs of the site taken in 1947 show the site undeveloped. The prominent north-northeast trending ridge that the current Peninsula High School occupies appears to be sparsely vegetated with patches of trees along the southwest and northeast slopes and shows no indications of grading. The northwest slopes contain deep erosion gullies and minor landslide scars at the heads of the drainages. Interstate 280 and the surrounding subdivisions have not yet been constructed.

The 1955 photograph shows Interstate 280 is partially completed and considerable grading to the north of the site near San Bruno Avenue. No notable changes at the site.

The 1956 photographs show considerable grading for the subdivisions to the west along Madison Avenue wrapping around the base of the prominent ridge that encompasses the site and extending to Courtland Avenue. The slope appears to be cut, graded and steepened at its base near the current property boundaries of approximately 300 to 350 Madison Avenue. The lower parts of the drainages along the western slope of the property have been partially graded and filled. The upper slopes have been left unaltered. There is a graded construction road that crosses the property from north to south near the location of current Courtland Avenue.

The 1958 photographs show considerable grading along the base of the prominent ridge to the west and northwest for the surrounding subdivisions. Minor grading has begun in the southwest part of the site. A notable thickly vegetated drainage swale extends upward to the northwest towards the current location of Building D.

The photographs from 1961 show grading occurring at the site. The site is notably flat and stepped down to the north-northeast and the prominent arcuate cut at the southwest corner is visible. The upper portion of the drainage swale mentioned above, downslope from Building D has been partially filled and graded. Interstate 280 does not yet extend past the site and grading has not yet begun along the southeast downslope side of the property.

The 1965 photographs show all buildings constructed and playing fields at the site, similar to the current conditions. Planting and landscaping appear new and vegetation is sparse. Areas of fill and grading contacts around the perimeter of the site are clearly visible. Notable fill and terraces

are visible along the western downslope side of the property and appear to have filled in the prominent drainages and erosion scars that were described in earlier photos.

The 1969 photographs show all buildings constructed and playing fields at the site, similar to the current conditions. Interstate 280 is complete and wraps around the southeast part of the site. The San Bruno Chinese Church has been constructed and exists to the east of the site and the bench for the telecommunications facilities has been graded. Substantial terracing, landscaping and drainage improvements are visible downslope along the southeast property boundary and upslope from Interstate 280.

Photographs from 1972, 1975, 1977, 1979, 1981, 1983, 1985, 1989, 1991, 1993, 1995, 1997 to 2000 show no visible changes other than changes in vegetation and trees across the site.

The 2005 photographs show a visible landslide scar at the back of 340 Madison Avenue, downslope and approximately 300 feet west of the Upper Field.

Google Earth aerial photos from April 2008 show a rectangular (plastic sheeting) cover where the landslide scar was identified at 340 Madison Avenue. Later photos of the site show the sheeting gradually obscured by soil and/or vegetation. Most recent photos from September 2021 show no visible surficial slope movement at the location of the repair.

TABLE 1
Aerial Photographs Reviewed

Date	Photo Number	Scale	Type
8/31/47	AV 13-03-01,02	1:15,000	B&W
5/5/55	AV 170-06-23	1:10,000	B&W
5/27/56	ddB-1956-1R-6	1:10,000	B&W
9/6/56	GS-vlx_1-96-1	1:10,000	B&W
4/23/58	AV 279-07,-34,35,36	1:7200	B&W
6/20/61	AV 432-03-24	1:12,000	B&W
5/11/65	CAS-130_1-48-2	1:10,000	B&W
10/30/69	AV 933-06-20,21	1:12,000	B&W
5/10/72	AV 1045-06-22,23	1:12,000	B&W
5/12/75	AV 1188-05-23,24	1:12,000	B&W
6/2/77	AV1356-05-19,20,21	1:12,000	B&W
6/19/81	AV 2020-04-25	1:12,000	B&W
6/19/81	AV 2020-05-20,21,25	1:12,000	B&W
6/6/83	AV 2265-05-21,22	1:12,000	B&W
10/14/85	AV2670-5-22,23	1:12,000	B&W
5/30/89	AV 3556-5-23,24	1:12,000	B&W
7/2/91	AV 4075-6-22,23	1:12,000	B&W
8/27/93	AV 4515-6-22,23	1:12,000	B&W
9/7/95	AV 4916-6-22,23	1:12,000	B&W
6/23/97	AV 5433-6-20,21	1:12,000	B&W
8/15/00	AV 6600-5-23	1:12,000	B&W
3/15/05	KAV-9010-77-3	1:10,000	B&W
10/17/05	KAV-9200-31-10,12	1:7,200	B&W

5.3 Subsurface Conditions

A regional geologic map of the site and vicinity (Figure 3) indicates the site is underlain primarily by the upper Pliocene Merced Formation (Tme). During our subsurface investigation, we encountered existing fill overlying Merced Formation bedrock that extends to the maximum depth explored (49.75 feet bgs). A thin layer (less than about 1 foot thick) of apparent colluvium

was mapped between the fill and the Merced Formation in the test pits excavated at the top of the slope. The thickness of fill at our boring locations ranges from approximately 0 to 16 feet bgs across the site with the thickest fill being near the top of the western slope. The fill encountered in our borings and the previous borings by Cleary Consultants (2020) consisted of medium dense to dense silty and clayey sand, very stiff to hard sandy clay, silty clay, and sandy silt. Atterberg limits tests on the fill indicated the soil has low expansion potential with plasticity indices (PI's) ranging from 5 to 13. Based on the SPT blow counts, visual examination of the fill exposed in the test pits, and the measured dry densities, we conclude the existing fill is well compacted. An approximately 9-foot-thick layer of very stiff sandy clay was encountered at a depth of about 16 feet bgs at the location of Boring RG-10, which was drilled near the location of an apparent subdrain installed during the original site development. Therefore, it is possible the clay layer consists of fill placed during the original grading of the school site; however, there is no evidence of a deep gully in this area in the historic aerial photograph from 1956.

The bedrock beneath the fill consists of moderately consolidated, friable, yellow-brown to dark gray silty sandstone and weakly consolidated, dense to very dense silty sand, and hard silt and sandy silt (Merced Formation).

Groundwater was not encountered in any of our recent borings or the previous borings by Cleary Consultants. In our previous borings, which were drilled during the rainy season of 2022, groundwater was measured in Boring RG-1 at 17 feet bgs and wet zones were noted in Boring RG-3. The boreholes were backfilled immediately after drilling and, therefore, the measurements likely do not represent stabilized groundwater conditions. Based on these observations, it should be expected that perched groundwater in the fractures of the bedrock likely occurs seasonally. Considering the site topography and the shallow depth to bedrock, we anticipate there may also be seasonal perched groundwater on or near the surface of the bedrock.

Idealized subsurface profiles showing the existing topography and the subsurface conditions encountered in our borings are presented on Figures 4 through 9. The locations of the subsurface profiles are shown on Figure 2a.

6.0 REGIONAL SEISMICITY

The closest active faults in the area are the San Andreas, San Gregorio, Monte Vista, and Hayward faults. These and other faults in the region are shown on Figure 10. Numerous damaging earthquakes have occurred along these faults in recorded time. For these and other active faults within a 50-kilometer radius of the site, the distance from the site and estimated characteristic moment magnitude[1] [Petersen et al. (2014) & Thompson et al. (2016)] are summarized in Table 2. These references are based on the Third Uniform California Earthquake Rupture Forecast (UCERF3), prepared by Field et al. (2013).

[1] Moment magnitude (M_w) is an energy-based scale and provides a physically meaningful measure of the size of a faulting event. Moment magnitude is directly related to average slip and fault rupture area.

TABLE 2
Regional Faults and Seismicity

Fault Segment	Approximate Distance from Site (km)	Direction from Site	Mean Characteristic Moment Magnitude
Total North San Andreas (SAO+SAN+SAP+SAS)	0.7	West	8.04
North San Andreas (Peninsula, SAP)	0.7	West	7.38
San Gregorio (North)	10	West	7.44
Monte Vista - Shannon	18	Southeast	7.14
Total Hayward + Rodgers Creek (RC+HN+HS+HE)	29	East	7.58
Hayward (South, HS)	29	East	7.00
Hayward (North, HN)	29	Northeast	6.90
Butano	34	South	6.93
North San Andreas (North Coast, SAN)	38	Northwest	7.52
Total Calaveras (CN+CC+CS+CE)	43	Northeast	7.43
Calaveras (North, CN)	43	Northeast	6.86
Mount Diablo Thrust	45	Northeast	6.67
Mount Diablo Thrust North CFM	45	Northeast	6.72
Zayante-Vergeles (2011 CFM)	48	South	7.48
Mount Diablo Thrust South	49	East	6.50

Damaging earthquakes have occurred along many of these faults in recorded history, as depicted on Figure 4 (USGS, 2021). Notable historic earthquakes which have impacted the Bay Area in recorded history include:

- 1838 San Andreas Earthquake, M_w = 7.4 (estimated)
- 1865 San Andreas Earthquake, M_w = 6.5 (estimated)
- 1868 Hayward Earthquake, M_w = 7.0 (estimated)

- 1906 Great San Francisco Earthquake (San Andreas Fault), M_w = 7.9 (estimated)
- 1989 Loma Prieta Earthquake (San Andreas Fault), M_w = 6.9
- 2014 West Napa Earthquake, M_w = 6.0

As a part of the UCERF3 project, researchers estimated that the probability of at least one $M_w \geq 6.7$ earthquake occurring in the greater San Francisco Bay Area during a 30-year period (starting in 2014) is 72 percent. The highest probabilities are assigned to sections of the Hayward (South), Calaveras (Central), and San Andreas (Santa Cruz Mountains) faults. The respective probabilities are approximately 25, 21, and 17 percent.

7.0 SEISMIC AND GEOLOGIC HAZARDS

Because the project site is in a seismically active region, we evaluated the potential for seismic and geologic hazards, including ground shaking, ground surface rupture, landslides, liquefaction,[2] lateral spreading,[3] and cyclic densification.[4] We used the results of our field investigation to evaluate the potential of these phenomena occurring at the project site.

7.1 Ground Shaking

The ground shaking intensity felt at the project site will depend on: 1) the size of the earthquake (magnitude), 2) the distance from the site to the fault source, 3) the directivity (focusing of earthquake energy along the fault in the direction of the rupture), and 4) site-specific soil conditions. The western edge of the site is about 1,800 feet from the San Andreas Fault. Therefore, the potential exists for a large earthquake to induce very strong to violent shaking at the site during the life of the project.

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[2] Liquefaction is a phenomenon where loose, saturated, cohesionless soil experiences temporary reduction in strength during cyclic loading, such as that produced by earthquakes.

[3] Lateral spreading is a phenomenon in which surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. Upon reaching mobilization, the surficial blocks are transported downslope or in the direction of a free face by earthquake and gravitational forces.

[4] Cyclic densification is a phenomenon in which non-saturated, cohesionless soil is compacted by earthquake vibrations, causing ground-surface settlement.

7.2 Ground Surface Rupture and Co-Seismic Ground Deformation

Historically, ground surface displacements closely follow the trace of geologically young faults. The site is not within an Earthquake Fault Zone, as defined by the Alquist-Priolo Earthquake Fault Zoning Act, and no known active or potentially active faults exist on the site. We therefore conclude the potential for fault offset at the site from a known active fault is very low. In a seismically active area, the remote possibility exists for future faulting in areas where no faults previously existed; however, we conclude the potential for surface faulting from previously unknown faults is also very low.

The site is about 400 feet from the Serra Fault, which was originally zoned as potentially active by the State of California. Subsequent studies performed in the 1980s concluded that evidence for Holocene-age faulting along the Serra Fault is lacking, and it is currently classified as Quaternary in age (i.e., displacement in the past two million years), but not considered active (i.e., displacement in the past 11,000 years). Due to the lack of evidence of Holocene-age faulting, the Serra Fault is currently not zoned as an Earthquake Fault Zone on the Earthquake Zones of Required Investigation (Figure 11).

The previous geotechnical report prepared by Cleary Consultants (2020) stated "in the event of seismically induced strong ground shaking, it is our opinion that co-seismic ground cracking/fracturing (i.e., ridgetop cracking) is reasonably likely to occur at the property due to the relatively shallow bedrock conditions." Although we do not believe "ridgetop cracking" will occur at the site during a seismic event, there is some uncertainty whether co-seismic ground cracking could occur at the site because of its position between the active San Andreas Fault and the Quaternary-age Serra Fault. We reviewed the publication titled *Historic Ground Failures in Northern California Associated with Earthquakes* prepared by T.L. Youd and S.N. Hoose (1978), and we found no evidence of significant ground cracking in the site vicinity or co-seismic movement of the Serra Fault during the 1906 San Francisco Earthquake. The absence of significant ground cracking in the 1906 San Francisco Earthquake does not rule out the potential for some ground deformation, however, and we believe it would be prudent to assume ground

deformations of several inches could occur at the site during a major earthquake on the San Andreas Fault.

7.3 Liquefaction and Associated Hazards

When a saturated cohesionless soil liquefies, it experiences a temporary loss of shear strength created by a transient rise in excess pore pressure generated by strong ground motion. Soil susceptible to liquefaction includes loose to medium-dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Flow failure, lateral spreading, differential settlement, loss of bearing strength, ground fissures, and sand boils are evidence of excess pore pressure generation and liquefaction.

The project site is not mapped within a liquefaction zone as shown on Figure 11. The results of our subsurface investigation indicate the graded portion of the site is blanketed by up to 16 feet of fill overlying bedrock. Based on the SPT blow counts and laboratory testing, we conclude the fill and underlying bedrock are not susceptible to liquefaction because of their cohesion or relative density. Therefore, we conclude the potential for liquefaction and associated hazards to occur at the site is very low.

7.4 Cyclic Densification

Cyclic densification (also referred to as differential compaction) of non-saturated sand (sand above groundwater table) can occur during an earthquake, resulting in settlement of the ground surface and overlying improvements. The results of our investigation indicate the site is underlain by fill consisting of medium dense to very dense clayey sand and silty sand, as well as very stiff to hard sandy clay and sandy silt overlying Merced Formation bedrock. We conclude these materials are not susceptible to cyclic densification because of their cohesion or relative density. Therefore, we conclude the potential for cyclic densification to occur at the site is low.

7.5 Slope Stability

Nearly all the slope on the western portion of the project site, as well as the lower portion of the slope on the Caltrans property to the east, are mapped as areas where “previous occurrence of

landslide movement, or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements", as defined on the map titled titled *Earthquake Zones of Required Investigation, Montara Mountain Quadrangle* (see Figure 11). Based on our review of the publication titled *Historic Ground Failures in Northern California Associated with Earthquakes* prepared by T.L. Youd and S.N. Hoose (1978), it does not appear any significant landslides occurred on the pre-development slopes during the 1906 San Francisco Earthquake. Further, there is no evidence of any significant movements of the slopes during the 1989 Loma Prieta Earthquake. Based on this lack of evidence of slope instability during past earthquakes, we conclude the slopes have been mapped as areas where there is potential for seismically induced landslides to occur due to their topography (i.e., slope inclination) rather than previous occurrence of landslide movement.

Based on our review of historic aerial photographs and our geologic reconnaissance, we conclude there has been no evidence of significant slope instability on the slopes on and adjacent to the site since at least 1947 (earliest historic aerial photograph reviewed). As discussed above and as shown on Figure 2a, there is a relatively deep erosional scour below the outlet of an existing pipe on the Caltrans property to the east and localized erosion gullies and shallow slope failures in various locations on the western slope. The presence of distressed asphalt pavement in localized areas on the eastern and western edges of the terraced portion of the site suggests slope creep is occurring in those areas. Letters and reports prepared by Lowney Associates, Upp Geotechnology, Inc., and Cleary Consultants prepared between 1993 and 2008 indicate that a landslide occurred on the hillside above the residences at 310 through 350 Madison Avenue. In a report dated June 1, 1993, Upp Geotechnology, Inc. concluded the slope was oversteepened during the original grading of the subdivision and recommended a 5-foot-high debris wall be installed to intercept and retain any landslide material. It appears a wood wall was subsequently installed. Correspondence to SMUHSD from the City of San Bruno stated that earth movement on the 300 Block of Madison Avenue on January 31, 2006 caused the backyard retaining wall to tip and mud to fill the "City" concrete v-ditch at the base of the slope. Based on our review of the correspondence from the various consultants and our review of the historic aerial photographs, we conclude the localized slope instability at the base of the slope that occurred in 1993 was a

shallow landslide that occurred in an oversteepened portion of the slope. The potential for future instability in this area can be mitigated by minor remedial regrading of the slope in that area as discussed in Section 8.1.5. We also conclude the shallow landslide has no impact on the global stability of the slope.

Hydrophytic vegetation was observed at the base of the fill at the contact with the native slope, locally, along the upper part of the western slope, suggesting perched groundwater flow along the top of the native bedrock at the fill contact. Lack of evidence of past slope instability in these areas throughout the site and vicinity since at least since 1947 suggests the grading and compaction of the fill around the perimeter of the site and the competence of the underlying soil has been affected little by the perched groundwater condition. Furthermore, groundwater was only encountered within one exploratory boring (RG-1) located near the middle of the upper field, suggesting the perched groundwater is localized and minor.

7.5.1 Slope Stability Analyses

The stability of the existing slopes on and adjacent to the site was evaluated using the results of our field investigation, laboratory test results, geologic interpretation, and engineering analyses. Six geologic cross sections, A-A' (northern slope on Figure 4), D-D' & E-E' (Figure 6), G-G' (Figure 7), H-H' (Figure 8) and I-I' (Figure 9), were developed at various locations in the proposed development area, as shown on Figure 2a. We then developed two-dimensional models of the soil and bedrock profile for each of the six geologic cross sections for slope stability analysis. In developing the two-dimensional models, we conservatively assumed the fill to extend horizontally across the profile. The two-dimensional models are presented in Appendix D.

As previously presented in Section 5.3, groundwater was not encountered in any of our borings or the previous borings by Cleary Consultants, except groundwater was measured in Boring RG-1 at 17 feet bgs and wet zones were noted in Boring RG-3. Based on these observations, it should be expected that perched groundwater in the fractures of the bedrock likely occurs seasonally and there may also be seasonal perched groundwater on or near the surface of the bedrock. We

performed slope stability analysis for static loading conditions assuming perched groundwater near the top of bedrock at the top of the slope and at about 5 feet below the ground surface on the slope. We also performed static slope stability analysis and pseudostatic analysis assuming no perched groundwater.

Static slope stability and pseudostatic analyses were performed using two-dimensional general limit equilibrium (GLE) methodology with the computer program, Slope/W v8.14.3.13430 (Geo-Slope, 2014). Interslice forces were determined using the Morgenstern-Price method. Based on the relatively minor apparent cohesion from the direct shear test results, we used drained soil and bedrock strengths for both static and seismic loading. Further, because our subsurface investigation indicated only localized perched groundwater underlying the site, we assumed groundwater was not present in the sections we analyzed for static conditions and seismic deformations. The soil and bedrock properties used in our analyses are summarized below in Table 3.

TABLE 3
Material Engineering Properties for Slope Stability Evaluation

Material Type	Loading Conditions (Drained/Undrained)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Existing Fill	Drained	123	125	37
Merced Formation Bedrock 1	Drained	128	425	45
Merced Formation Bedrock 2	Drained	128	575	40

Static stability is evaluated in terms of "Factor of Safety" (FS) and yield acceleration is the fraction of acceleration due to gravity (g) which is applied horizontally to the model such that the FS is reduced to 1.0. In general, a static FS of 1.5 or high is typically considered acceptable for slopes, while lower values may be acceptable if the consequences of slope failure are judged to be small. A summary of results of our slope stability analyses are presented below in Table 4 and in Appendix D.

TABLE 4
Summary of Slope Stability Evaluation

Cross Section	Analysis Type	FS	Yield (Ky)	Displacement (inches)	Approx Setback Length from Edge of Slope (feet)
A-A’	Static no groundwater	1.9	-	-	
	Seismic no groundwater	1.0	0.37	9	1
	Static with groundwater	1.9	-	-	
D-D'	Static no groundwater	2.5	-	-	
	Seismic no groundwater	1.0	0.54	4	4
	Static with groundwater	2.3	-	-	
E-E'	Static no groundwater	3.3	-	-	
	Seismic no groundwater	1.0	0.56	4	3
	Static with groundwater	2.3	-	-	
G-G’	Static no groundwater	2.2	-	-	
	Seismic no groundwater	1.0	0.47	5	7
	Static with groundwater	2.0	-	-	
H-H’	Static no groundwater	2.4	-	-	
	Seismic no groundwater	1.0	0.53	4	3
	Static with groundwater	2.3	-	-	
I-I'	Static no groundwater	2.1	-	-	
	Seismic no groundwater	1.0	0.40	12	4
	Static with groundwater	2.0	-	-	

To evaluate the potential seismic performance of the slope, we performed a simplified deformation analysis following the procedure proposed by Bray and Travasarou (2007). The methodology developed by Bray and Travasarou (2007) is one of the accepted simplified

Newmark displacement estimation procedures listed in the California Geological Survey (CGS) Special Publication 117A (SP-117A) titled *Guidelines for Evaluating and Mitigating Seismic Hazard Zones in California*, dated September 11, 2008, for estimating seismic ground displacements. In our analysis, we used a moment magnitude of 8.0 and a spectral acceleration of 1.15 to 1.4 times gravity at the degraded period (1.5Ts) of the sliding mass for the Design Earthquake.

The approximate yield coefficient of the critical slide mass was estimated by inputting a horizontal pseudo-static coefficient into the slope stability model and increasing it until a factor of safety of 1.0 was reached. The corresponding yield coefficients (ky) and the estimated median earthquake deviatoric seismic slope displacements of the identified critical failure surface during the design earthquake on the San Andreas Fault are presented above in Table 4. The estimated median horizontal displacements range from about 4 to 12 inches.

Based on our analyses, we conclude the existing slopes on and adjacent to the site are stable under both static and seismic conditions with estimated displacements of less than 12 inches near the tops of the slopes during a major earthquake. To reduce the potential for damage to the proposed residences and the C-3 development, we recommend the buildings and the basin be set back at least 8 feet from the top of slope.

Following periods of heavy rainstorms, localized slope shallow sloughing may develop due to concentrated groundwater flow along the soil/bedrock interface. We conclude these occasional surficial slope slips will not significantly impact the overall slope stability at the site or the proposed improvements to be constructed at the project site. Areas where shallow sloughing has occurred can be repaired with minor site grading and surface erosion control measures as discussed below in Section 8.1.5.

8.0 CONCLUSIONS AND RECOMMENDATIONS

From geotechnical and geological standpoints, we conclude the proposed development can be constructed as planned, provided the recommendations presented in this report are incorporated into the project plans and specifications and implemented during construction. The primary

geotechnical concerns to be considered in the proposed design and construction of the proposed improvements are: 1) the potential for seismically induced ground deformations of several inches during a major earthquake on the San Andreas Fault, and 2) designing the proposed development to minimize both the infiltration of surface water into the existing fill and surface water flow over the on-site slopes. Our conclusions and recommendations regarding these and other geotechnical aspects of the project are presented in this section.

8.1 Site Preparation, Fill Placement and Grading

8.1.1 Site Preparation

Site demolition should include the removal of existing pavements, underground utilities, and foundations. Site clearing should include removal of any vegetation and organic topsoil (where present). Organic topsoil generated during stripping should be removed from the site or stockpiled for later use in landscaped areas, if approved by the landscape architect. Tree roots with a diameter greater than 1/2 inch within 3 feet of subgrade should be removed.

In general, abandoned underground utilities should be removed to the property line or service connections and properly capped or plugged with concrete. In addition to the excavations required to remove abandoned utilities, excavations will be required to remove existing foundations. Once demolition is complete, excavations should be properly backfilled with engineered fill in accordance with the recommendations presented in this Section 8.1.3 and under the observation of the Geotechnical Engineer.

Concrete generated on-site during demolition can be crushed and reused as engineered fill provided it is acceptable from an environmental standpoint and the materials are broken into pieces smaller than 2 inches in greatest dimension and mixed with sufficient fine-grained material to minimize the presence of voids. Prior to grading, a 5-gallon sample of the mixed material should be provided to the Geotechnical Engineer for additional laboratory testing (as appropriate) and approval of the material for use.

Site preparation should also include remedial grading to remove disturbed soil that extends below proposed improvements and backfilling the resulting excavations with compacted

engineered fill. Recommendations for fill quality and compaction of engineered fill are presented in Section 8.1.3. Recommendations for keyways, subdrains, and benching for engineered fill slopes are presented in Section 8.1.4.

8.1.2 Subgrade Preparation

After site clearing is completed, in areas that will receive improvements or fill, the soil subgrade exposed should be scarified to a depth of at least 8 inches, moisture-conditioned and compacted in accordance with the recommendations provided in Table 5 (Section 8.1.3). The soil subgrade should be kept moist until covered by fill or improvements. The on-site soil is highly susceptible to "pumping" when moisture contents are a few percent above optimum. Therefore, if grading will be performed during the rainy season, it should be anticipated the near-surface soil will need to be dried through aeration prior to compaction or treated with cement if aeration is not practical.

8.1.3 Fill Quality and Compaction

From a geotechnical standpoint, on-site soil free of organic matter and rocks or lumps greater than 3 inches in greatest dimension should be suitable for use as fill or backfill provided it is properly moisture-conditioned. Excavated bedrock may also be used as fill, provided it is broken down so that particles are less than 3 inches in greatest dimension with no more than 80 percent being greater than 2 inches in greatest dimension. Excavated bedrock that cannot be broken down to less than 3 inches may need to be removed from the site or selectively placed at the bottom of deeper fills.

Imported fill should have low corrosion potential (defined as a resistivity of more than 2,000 ohm-cm), be free of organic matter, contains no rocks or lumps larger than 3 inches in greatest dimension, has a liquid limit of less than 40 and a plasticity index lower than 12, and is approved by the Geotechnical Engineer. Samples of proposed imported general fill material should be submitted to the Geotechnical Engineer at least three business days prior to use at the site. The grading contractor should provide analytical test results or other suitable environmental documentation indicating the imported fill is free of hazardous materials at least three days

before use at the site. If this data is not available, up to two weeks should be allowed to perform analytical testing on the proposed imported material.

Engineered fill should be placed in horizontal lifts not exceeding 8 inches in uncompacted thickness, then moisture-conditioned and compacted following the recommendations presented in Table 5.

TABLE 5
Summary of Compaction Recommendations

Location	Relative Compaction (percent)	Moisture Content
General fill and backfill – Less than 5 feet thick	90+	Above optimum
General fill and backfill – More than 5 feet thick	95+	Above optimum
General fill – granular soil*	95+	Near optimum
Sidewalk/flatwork – subgrade and aggregate base	90+	Above optimum
Vehicular pavement – subgrade and aggregate base	95+	Near optimum
Utility trench backfill – less than 5 feet thick	90+	Above optimum
Utility trench backfill – more than 5 feet thick	95+	Above optimum
Utility trench backfill – granular soil*	95+	Near optimum

* Granular soil defined as poorly graded sand or gravel containing less than 5 percent fines content.

8.1.4 Engineered Fill Slopes

This section presents our recommendations for engineered fill slopes. Typical buttress/keyway fill slope sections are also presented on Figure 12.

Keyways and Subdrains

After stripping and clearing, construction of engineered fill slopes should first begin with construction of keyways and subdrains. Fills should be adequately keyed into competent bedrock. For preliminary planning purposes, keyways measuring at least 4 feet deep and 8 feet wide (into the hillside) should be excavated beneath the toe of proposed fill slopes. A subdrain consisting of a 6-inch-diameter perforated pipe surrounded by at least 12 inches of drain rock wrapped in filter fabric should be installed at the back of the keyway and sloped to drain to a suitable discharge point. The keyway should be backfilled with engineered fill, placed in lifts not exceeding 8 inches in loose thickness, and compacted to at least 90 percent relative compaction (95 percent for fill thicker than 5 feet). Subsequent lifts of fill should be placed and compacted in a similar manner, with each lift being benched into the sides of the keyway excavation at an equivalent slope of 2:1 (horizontal to vertical).

Final keyway sizes and locations should be determined by the Geotechnical Engineer after final grading plans become available. The size of the keyways may be adjusted in the field by the Geotechnical Engineer during grading.

Benching and Fill Placement

New fill should be built up on a series of horizontal benches cut into the existing slope at an equivalent slope no steeper than 2:1 (horizontal to vertical). Benching into the existing slopes should be performed under the observation our field engineer or field geologist, who can verify that the benches extend into competent material. The design should also incorporate subdrains to prevent saturation of the engineered fill, which may result from surface or subsurface water draining from the hillside. Bench intervals will be determined by the Geotechnical Engineer when final grading plans are available. Typical bench intervals vary between 5 and 10 feet vertically.

To promote proper compaction of the finished grade, all finished fill slopes should be overbuilt and trimmed back to the design slope.

Erosion Control

We recommend protecting fill slopes against erosion by hydroseeding or hydromulching with deeply rooted, fast-growing vegetation after construction is complete. If the vegetation will not be established prior to the rainy season, slopes should be protected using measures such as netting, hay bales, and/or silt fences. We do not recommend irrigating the slopes except for an initial period to establish vegetation, if necessary. The final erosion control plan should be developed by your landscape architect.

8.1.5 Remedial Grading on Slopes

As discussed in Section 7.5, shallow landslides have previously occurred in localized oversteepened portions of the western slope during periods of heavy rain. The potential for future instability in the existing landslide areas can be mitigated by minor remedial grading. Prior to grading these areas, the depth of the loose material should be determined with probes and hand-auger borings. Loose/disturbed soil should be excavated by hand so the remaining thickness of the loose/disturbed soil is less than 12 inches. The soil exposed at the excavation subgrade should be moisture-conditioned to near optimum and compacted with a large vibratory plate (Turtle) to at least 90 percent relative compaction. The fill should then be placed in lifts not exceeding 8 inches in loose thickness, moisture-conditioned to near optimum moisture content, and compacted in accordance with recommendations presented above in Table 5. The surface of the regraded areas should be relatively uniform and should match the adjacent grades on the slope face. Hydroseeding or hydromulching with deeply rooted, fast-growing vegetation should be performed after construction is complete. If the vegetation will not be established prior to the rainy season, slopes should be protected using measures such as netting, hay bales, and/or silt fences.

8.1.6 Utility Trench Backfill

All trenches should conform to the current CAL-OSHA requirements. To provide uniform support, pipes or conduits should be bedded on a minimum of 4 inches of sand or fine gravel. After the pipes and conduits are tested, inspected (if required) and approved, they should be covered to a depth of 6 inches with sand or fine gravel, which should be mechanically tamped.

Backfill for utility trenches should be compacted according to the recommendations presented for general site fill in Section 8.1.3. Jetting of trench backfill should not be permitted. The soil excavated from the trenches can be reused to backfill the trenches, provided the material can be compacted to the required compaction. If poorly graded sand or gravel with less than 5 percent fines (particles passing the No. 200 sieve) is used or more than 5 feet of backfill will be placed, it should be compacted to at least 95 percent relative compaction. Pea gravel, drain rock, and rod mill should be mechanically tamped in 12-inch lifts where placed beneath pavements. Special care should be taken when backfilling utility trenches beneath pavements and flatwork. Poor compaction may result in excessive settlement and damage to the pavements and/or flatwork.

We recommend installing trench dams for utility trenches running perpendicular to the slope contours. The trench dam spacing should not exceed 50 feet. Backfill of utility trenches running perpendicular to the slope should consist of material that is not susceptible to erosion (e.g., compacted aggregate base material).

Underground utilities that are to be excavated within the zone-of-influence of the building or retaining wall foundations, defined by an imaginary line extending down from the bottom of the foundation at an inclination of 1.5:1 (horizontal to vertical), should be backfilled with controlled low-strength material (CLSM) with a 28-day unconfined compressive strength of at least 100 pounds per square inch (psi) or engineered fill compacted to at least 95 percent relative compaction. We highly recommend backfilling trenches prior to pouring the building foundations. If utility trenches are to be excavated below this zone-of-influence line after construction of the building foundations, the trench walls need to be fully supported with shoring until CLSM is placed.

8.1.7 Exterior Concrete Flatwork

We recommend a minimum of 4 inches of Class 2 aggregate base be placed beneath the proposed exterior concrete flatwork, including sidewalks; the aggregate base should extend at least 6 inches beyond the slab edges where adjacent to landscaping unless constrained by a

vertical curb. Class 2 aggregate base beneath exterior slabs-on-grade should be compacted in accordance with the recommendations presented in Section 8.1.3.

8.1.8 Geotechnical Services during Grading

All grading and site development plans should be reviewed by the Geotechnical Engineer to verify that they conform to the intent of our recommendations. The Geotechnical Engineer should be present and on-site to observe demolition and related fill placement, site grading, subgrade preparation, and fill and subdrain placement. In addition, the Geotechnical Engineer should perform nuclear field density tests to check the moisture content and relative compaction of soil subgrade, engineered fill, and utility trench backfill. These observations and tests will allow us to compare actual with anticipated soil conditions and to check that the contractor's work conforms to the geotechnical aspects of the plans and specifications. If any variations or undesirable conditions are encountered during construction, we should be notified so that additional recommendations can be made.

8.2 Surface Drainage

Positive surface drainage should be provided around the buildings and other improvements to direct surface water away from the foundations and existing and existing slopes. Grades around the buildings should be determined by the Civil Engineer and conform to the requirements of the 2022 CBC, which will help minimize stormwater accumulation adjacent to foundations. In addition, roof downspouts should be discharged into controlled drainage facilities to keep the water away from the foundations. Grades should be sloped down away from the tops of the existing slopes around the site perimeter at a gradient of at least 5 percent in unpaved areas. Where it is not feasible to slope grades away from the top of the existing slope, a concrete-lined drainage ditch should be constructed at the top of the slope to collect and transport runoff of surface water to a suitable outlet or retention basin.

8.3 Foundation Support and Settlement

As discussed in Sections 7.2 and 7.5, we conclude ground deformations of 4 to 12 inches could occur at the site during a major earthquake on the San Andreas Fault. To reduce the potential for

building damage due to seismically induced ground deformation, we recommend the proposed residential buildings be set back at least 8 feet from the tops of slopes and supported on shallow stiffened foundations, such as a grid system of interconnected continuous footings (i.e., a "grid" foundation), a post-tensioned slab-on-grade (P-T slab), or a conventionally reinforced mat foundation. We estimate total settlement of these foundation types under static loading would be less than 1/2 inch, and differential settlement would be less than 1/4 inch over a horizontal distance of 30 feet. Recommendations for each foundation type are presented below.

8.3.1 Interconnected Continuous Footings

A grid system consisting of interconnected continuous footings may be used to support the proposed residences. The footings should be at least 16 inches wide and bottomed at least 18 inches below the lowest adjacent interior soil subgrade (i.e., below bottom of capillary break). Where the footings will be constructed near existing slopes (i.e., retaining wall footings), the footings should be bottomed such that the face of the footing, measured at the bottom of the footing, is at least 7 horizontal feet from the slope face. Footings should be designed to span at least 15 feet unsupported in the interior of the building and to cantilever at least 3 feet around the building perimeter. The footings may be designed using an allowable dead-plus-live-load bearing pressure of 3,000 pounds per square foot (psf). This pressure may be increased by one-third for total design loads, which include wind or seismic forces. The recommended allowable bearing pressures for dead-plus-live loads and total loads include factors of safety of at least 2.0 and 1.5, respectively.

Lateral loads may be resisted by a combination of passive pressure on the vertical faces of the foundations and friction between the bottoms of the foundations and the supporting soil. To compute lateral resistance, we recommend using an equivalent fluid weight of 300 pounds per cubic foot (pcf); the upper foot of soil should be ignored unless confined by a slab or pavement. Frictional resistance should be computed for footings using a base friction coefficient of 0.30. The passive pressure and frictional resistance values have included a factor of safety of at least 1.5 and may be used in combination without reduction.

Footing excavations should be free of standing water, debris, and disturbed materials prior to placing concrete. The bottoms and sides of the excavations should be moistened following excavation and maintained in a moist condition until concrete is placed. We should check footing excavations prior to placement of reinforcing steel to check for proper bearing and cleanout.

8.3.2 Mat Foundations

The proposed residences can be supported on conventionally reinforced mat foundations bottomed on properly compacted fill. The edges of the mat foundations should extend at least 9 inches below the lowest adjacent outside grade. We recommend the mat foundations be designed using allowable bearing capacities of 3,000 psf for dead-plus-live loads and 4,000 psf for total loads (including wind and seismic loads). To evaluate the pressure distribution beneath the mat foundation, we recommend a modulus of vertical subgrade reaction (k_{v1}) of 50 pounds per cubic inch (pci) be used. The mat foundations should be designed to span unsupported over a horizontal distance of 15 feet in the interior of the building and to cantilever at least 3 feet around the building perimeter.

Lateral loads may be resisted by a combination of friction along the base of the mat and passive resistance against the vertical faces of the mat foundation. To compute lateral resistance, we recommend using an equivalent fluid weight of 300 pcf; the upper foot of soil should be ignored unless confined by a slab or pavement. Frictional resistance should be computed using a base friction coefficient of 0.20, which assumes a vapor retarder is placed beneath the mat as described in the following paragraph. The passive pressure and frictional resistance values include a factor of safety of at least 1.5 and may be used in combination without reduction.

To limit water vapor moving through the mat foundation, we recommend installing a water vapor retarder beneath the mat. The vapor retarder should meet the requirements for Class A vapor retarders stated in ASTM E1745. The vapor retarder should be placed in accordance with the requirements of ASTM E1643. These requirements include overlapping seams by 6 inches, taping seams, and sealing penetrations in the vapor retarder.

Concrete mixes with high water/cement (w/c) ratios result in excess water in the concrete, which increases the cure time and results in excessive vapor transmission through the mat. Therefore, the concrete for the mat foundations should have a low w/c ratio - less than 0.45. Water should not be added to the concrete mix in the field. If necessary, workability should be increased by adding plasticizers. In addition, the mat foundations should be properly cured. Before floor coverings are placed, the contractor should check that the concrete surface and the moisture emission levels (if emission testing is required) meet the manufacturer's requirements.

The mat foundation should bear on compacted soil subgrade prepared as recommended in Section 8.1.2. We should check the mat subgrade prior to placement of the vapor retarder.

8.3.3 Post-Tensioned Slab-on-Grade

The proposed residential buildings may be supported on post-tensioned slabs-on-grade (P-T slabs). The edges of the P-T slab should extend at least 9 inches below the lowest adjacent outside grade. We recommend the P-T slabs be designed using allowable bearing capacities of 3,000 psf for dead-plus-live loads and 4,000 psf for total loads (including wind and seismic loads). To evaluate the pressure distribution beneath the P-T slab, we recommend a modulus of vertical subgrade reaction (k_{v1}) of 50 pounds per cubic inch (pci) be used. The P-T slab should be designed to span unsupported over a horizontal distance of 15 feet in the interior of the building and to cantilever at least 3 feet around the building perimeter.

Lateral loads may be resisted by a combination of friction along the base of the P-T slab and passive resistance against the vertical faces of the mat foundation. To compute lateral resistance, we recommend using an equivalent fluid weight of 300 pcf; the upper foot of soil should be ignored unless confined by a slab or pavement. Frictional resistance should be computed using a base friction coefficient of 0.20, which assumes a vapor retarder is placed beneath the P-T slab. The passive pressure and frictional resistance values include a factor of safety of at least 1.5 and may be used in combination without reduction.

To limit water vapor moving through the P-T slab foundation, we recommend installing a water vapor retarder beneath the slab. The vapor retarder should meet the requirements for Class A

vapor retarders stated in ASTM E1745. The vapor retarder should be placed in accordance with the requirements of ASTM E1643. These requirements include overlapping seams by 6 inches, taping seams, and sealing penetrations in the vapor retarder.

Concrete mixes with high water/cement (w/c) ratios result in excess water in the concrete, which increases the cure time and results in excessive vapor transmission through the P-T slab. Therefore, the concrete for the P-T slab foundations should have a low w/c ratio - less than 0.45. Water should not be added to the concrete mix in the field. If necessary, workability should be increased by adding plasticizers. In addition, the P-T slabs should be properly cured. Before floor coverings are placed, the contractor should check that the concrete surface and the moisture emission levels (if emission testing is required) meet the manufacturer's requirements.

The P-T slab should bear on compacted soil subgrade prepared as recommended in Section 8.1.2. We should check the P-T slab subgrade prior to placement of the vapor retarder.

8.4 Concrete Slab-on-Grade Floors

For the interconnected footing option, the building slab-on-grade floor should be underlain by a capillary break and vapor retarder. A capillary moisture break consists of at least 4 inches of clean, free-draining gravel or crushed rock. The vapor retarder should meet the requirements for Class B vapor retarders stated in ASTM E1745. The vapor retarder should be placed in accordance with the requirements of ASTM E1643. These requirements include overlapping seams by 6 inches, taping seams, and sealing penetrations in the vapor retarder. The particle size of the capillary break material and sand (if used) should meet the gradation requirements presented in Table 6.

TABLE 6
Gradation Requirements for Capillary Moisture Break

Sieve Size	Percentage Passing Sieve
1 inch	90 – 100
3/4 inch	30 – 100
1/2 inch	5 – 25
3/8 inch	0 – 6

Concrete mixes with high water/cement (w/c) ratios result in excess water in the concrete, which increases the cure time and results in excessive vapor transmission through the slab. Where the concrete is poured directly over the vapor retarder, we recommend the w/c ratio of the concrete not exceed 0.45. Water should not be added to the concrete mix in the field. If necessary, workability should be increased by adding plasticizers. In addition, the slabs should be properly cured. Before floor coverings, if any, are placed, the contractor should check that the concrete surface and the moisture emission levels (if emission testing is required) meet the manufacturer's requirements.

8.5 Permanent Retaining Walls

Permanent retaining walls should be designed to resist lateral earth pressure imposed by the retained soil and surcharge pressure, where appropriate. Where permanent walls will be restrained from movement at the top and/or sides they should be designed for the at-rest condition. Walls that retain soil and are not restrained from rotation may be designed for the active pressures presented in Table 7. The recommended design pressures are appropriate for walls that are fully drained. Walls that retain more than 6 feet of soil should be designed for the more critical loading condition of static or seismic conditions.

TABLE 7
Lateral Earth Pressures for Retaining Wall Design

Soil Backfill Inclination	Active Static Condition (Unrestrained)	At-Rest Static Condition (Restrained)	Seismic Condition
Level	33 pcf	52 pcf	33 pcf + 21 pcf
4:1	39 pcf	61 pcf	30 pcf + 25 pcf
3:1	41 pcf	65 pcf	41 pcf + 26 pcf
2:1	50 pcf	77 pcf	50 pcf + 32 pcf

If there will be any loads imposed above a "zone-of-influence" line extending up from the base of a retaining wall at an inclination of 1.5:1 (horizontal to vertical), the wall should be designed for a surcharge pressure. We can provide surcharge pressure upon request if this condition exists.

The recommended lateral earth pressures are applicable to walls that are backdrained above the water table to prevent the buildup of hydrostatic pressure. One acceptable method for backdraining the walls is to place a prefabricated drainage panel (Miradrain 6000 or equivalent) against the back of the walls. The drainage panel should extend down to a 4-inch-diameter perforated PVC collector pipe at the base of the walls. The pipe should be surrounded on all sides by at least 4 inches of Caltrans Class 2 permeable material (see Caltrans Standard Specifications Section 68-1.025) or 3/4-inch drain rock wrapped in filter fabric (Mirafi 140NC or equivalent). The pipe should be connected to a suitable discharge point that will not cause erosion of the slope. We should check the manufacturer's specifications regarding the proposed prefabricated drainage panel material to verify it is appropriate for its intended use.

Wall backfill material and compaction should conform to the recommendations presented in Section 8.1 of this report. Lightweight compaction equipment should be used to reduce stresses induced on the retaining walls during fill placement unless the walls are appropriately braced.

8.5.1 Retaining Wall Foundations

Site retaining walls may be supported on spread footings bottomed on stiff native soil and/or properly compacted fill. The footings should be bottomed at least 18 inches below the lowest adjacent finished grade. The allowable bearing pressure, friction factor, and passive pressure presented for footings design in Section 8.3.1 may be used for design of site retaining walls.

Retaining walls constructed on sloping ground with a gradient 3:1 (horizontal to vertical) or steeper or within 5 feet of the top of slope inclined at 2:1 or steeper should be supported on drilled, cast-in-place concrete piers gaining support through skin friction in the existing fill and underlying bedrock.

Drilled piers should be at least 18 inches in diameter and spaced at least three pier diameters, center to center. Drilled piers should be at least 8 feet long on level ground, 12 feet long where the ground surface inclination is between 2:1 and 3:1 (horizontal to vertical) and at least 15 feet long where the ground surface is inclined steeper than 2:1.

We recommend designing drilled piers using allowable skin friction values of 600 psf in soil and 1,000 psf in bedrock for dead-plus-live load conditions. These values may be increased by one-third for total load conditions. The allowable uplift capacity of the drilled piers may be taken as 80 percent of the above values. Support from end bearing and the upper 2 feet of soil should be ignored. Piers should be connected with grade beams bottomed at least 18 inches below the lowest adjacent grade.

Lateral resistance of piers will depend on the stiffness of the pier, the strength of the surrounding soil and bedrock, the inclination of the ground surface in front of the pier, allowable deflection of the pier top, and the moment induced in the pier. Lateral loads and corresponding moments have been calculated for 18-inch-diamter piers on level and sloping ground, assuming a free-head condition, a pier-head deflection of about 1/4 inch, and no applied moment at the top of the pier. The results of our lateral pier analyses for the recommended minimum pier lengths are presented in Table 8. We can perform additional analyses for piers of different lengths and diameters upon request.

TABLE 8
Lateral Pier Capacities

Pier Location	Pier Length (feet)	Pier Diameter (inches)	Lateral Load (kips)	Maximum Moment (kip-feet)	Depth to Maximum Moment (feet)
Level ground	8	18	17	31	3.5
Sloping ground (3:1)	12	18	14	39	5.0
Sloping ground (2:1)	15	18	13	41	6.0

8.6 Pavement Design

Design recommendations for asphalt concrete and Portland-cement concrete pavements are presented in the following sections.

8.6.1 Asphalt Concrete Pavement Design

The State of California flexible pavement design method was used to develop the recommended asphalt concrete pavement sections. The results of a laboratory R-value test performed on a sample of near surface soil (obtained from Boring RG-11 from depths of 1 to 5 feet bgs) indicates the soil has a resistance value (R-value) of 22. On the basis of the R-value test results, we selected a R-value of 20 for asphalt concrete pavement design. Recommended pavement sections for traffic indices (TIs) ranging from 4.5 to 7.5 are presented in Table 9. The project Civil Engineer should determine the appropriate design TI based on the anticipated vehicular traffic the pavement will experience. We can provide additional pavement sections for different TIs upon request.

TABLE 9
Asphalt Concrete Pavement Sections

TI	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
4.5	2.5	7.0
5.0	3.0	7.5
5.5	3.0	9.0
6.0	3.5	9.5
6.5	4.0	10.5
7.0	4.0	12.0
7.5	4.5	12.5
8.0	5.0	13.5
8.5	5.0	15.0

The upper 12 inches of the subgrade should be moisture-conditioned and compacted in accordance with recommendations presented in Section 8.1.3 and be non-yielding. The aggregate base should be moisture-conditioned to near optimum, compacted to at least 95 percent relative compaction, and also be non-yielding.

If pavements are adjacent to irrigated landscaped areas, curbs adjacent to those areas should extend through the aggregate base at least 3 inches into the underlying soil to reduce the potential for irrigation water to infiltrate into the pavement section. If drip irrigation is used in the landscaping adjacent to the pavement, however, the deepened curb is not required.

Where pavement is constructed near bioswales or other storm water treatment areas, curbs should be deepened so that the base is founded below an imaginary line extending up at an inclination of 1.5:1 (horizontal to vertical) from the base of the bioswale/treatment area. Further, deepened curbs near bioswales may require some type of lateral restraint. The need for lateral restraints to be applied on the deepened curbs should be evaluated during design of the biotreatment features.

8.6.2 Portland-Cement Concrete Pavement

The Portland-cement concrete (PCC) pavement section design is based on a maximum single-axle load of 20,000 pounds and a maximum tandem axle of 32,000 pounds (i.e., several garbage trucks per week). The recommended rigid pavement section for these axle loads is 6.5 inches of PCC over 6 inches of Class 2 aggregate base. For areas that will receive fire truck traffic, the pavement section should consist of 7 inches of PCC over 6 inches of Class 2 aggregate base. The pavement section for residential driveways should consist of 5 inches of PCC over 6 inches of Class 2 aggregate base.

The modulus of rupture and unconfined compressive strength of the concrete should be at least 500 and 3,200 psi at 28 days, respectively. Contraction joints should be spaced at 15 feet. Where the outer edge of concrete pavement meets asphalt pavement, the concrete slab should be thickened by 50 percent at a taper not to exceed a slope of 1 in 10. For areas that will see garbage/recycling truck traffic, we recommend the concrete slab be reinforced with a minimum of No. 4 bars at 16 inches on center in both directions.

Recommendations for subgrade preparation and aggregate base compaction for concrete pavement are the same as those we have described above for asphalt concrete pavement. Recommendations for pavements adjacent to irrigated landscaped areas, bioswales, or other storm water treatment areas are also the same as those presented above for asphalt concrete pavement.

8.7 Soil Corrosivity

Corrosivity tests were performed by Project X Corrosion Engineering of Murrieta, California on soil samples obtained from four borings at depths ranging from 3 to 7 feet bgs. The corrosivity test results are presented in Appendix B of this report.

Many factors can affect the corrosion potential of soil including, but not limited to, resistivity, pH, and chloride and sulfate concentrations. Based on the minimum soil resistivity measurements, which range from 1,072 to 1,206 ohm-cm, we conclude the soil is “highly corrosive” to buried metal (Roberge, 2018). Accordingly, all buried iron, steel, cast iron,

galvanized steel, and dielectric-coated steel or iron should be protected against corrosion depending upon the critical nature of the structure. If it is necessary to have metal in contact with soil, a corrosion engineer should be consulted to provide recommendations for corrosion protection.

The results indicate the pH of the near-surface soil pH ranges from 6.8 to 7.5, which should not have an adverse effect on buried concrete and buried metal. The chloride ion concentrations (14.1 to 36.7 mg/kg) indicate the chlorides in the near-surface soil are "negligibly corrosive" to buried metallic structures and reinforcing steel in concrete structures below ground. The results also indicate the sulfate ion concentrations (480 to 4,299 mg/kg) are "severely corrosive" to buried concrete and mortars. Measures to mitigate the adverse impacts of the sulfates on buried concrete include using Type V cement, a maximum water/cement ratio of 0.45, and a minimum unconfined compressive strength of 4,500 psi.

8.8 Excavations and Construction Considerations

The soil to be excavated is expected to consist primarily of sand which can be excavated with conventional earth-moving equipment such as loaders and backhoes.

Excavations that will be entered by workers should be sloped or shored in accordance with the Occupational Safety and Health Administration (OSHA) standards (29 CFR Part 1926). Where space permits, the sides of the temporary excavation can be sloped. We recommend that temporary slopes not exceed an inclination of 1.5:1 (horizontal to vertical) in sandy soil (OSHA Type C soil). Where space does not permit sloping of the excavation perimeter, a shoring system will be required to support the sides of the proposed excavation. The contractor should be responsible for the construction and safety of temporary slopes.

8.9 Seismic Design

The latitude and longitude of the site are 37.6135° and -122.4277°, respectively. For design in accordance with the 2022 CBC, we recommend the following:

- Site Class C (very dense soil & soft rock)
- S_S = 2.448g, S_1 = 1.026g
- F_a = 1.2, F_v = 1.4
- S_{MS} = 2.938g, S_{M1} = 1.436g
- S_{DS} = 1.959g, S_{D1} = 0.957g
- Seismic Design Category E for Risk Categories I, II, and III

9.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

Prior to construction, Rockridge Geotechnical should review the project plans and specifications to verify that they conform to the intent of our recommendations. During construction, our field engineer should provide on-site observation and testing during site preparation, placement and compaction of fill, and installation of foundations. These observations will allow us to compare actual with anticipated subsurface conditions and to verify that the contractor's work conforms to the geotechnical aspects of the plans and specifications.

10.0 LIMITATIONS

This geotechnical investigation has been conducted in accordance with the standard of care commonly used as state-of-practice in the profession. No other warranties are either expressed or implied. The recommendations made in this report are based on the assumption that the subsurface conditions do not deviate appreciably from those disclosed in our field investigation. If any variations or undesirable conditions are encountered during construction, we should be notified so that additional recommendations can be made. The foundation recommendations presented in this report are developed exclusively for the proposed development described in this report and are not valid for other locations and construction in the project vicinity.

REFERENCES

2022 California Building Code

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ROCKRIDGE GEOTECHNICAL

FIGURES



Base map: Google Maps, 2021

0 1,800 3,600 Feet

Approximate scale

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

SITE LOCATION MAP

Date 07/11/23	Project No. 22-2164	Figure 1



KEY

- Geologic Contact
- Approximate grading boundary
- 20 — Local slope inclination and direction
- Break in slope, along cut and filled terrace surfaces
- Soil creep, disturbed or hummocky surface
- Erosion gully or ditch with arrow pointed in flow direction
- Cut slope, hatchures pointed down slope
- Fill slope, hatchures pointed down slope
- 59 — Strike and dip of bedding (Rockridge Geotechnical, 2023)
- 65 — Strike and dip of bedding (Pampeyan, 1994)
- Strike and dip of vertical bedding (Pampeyan, 1994)

Geologic Units

Qg	Graded (terraced) areas, cut and filled locally
Qf	Artificial Fill (thickness greater than 2 feet)
Qsr	Slope Wash, Ravine Fill and Colluvium
Qls	Landslide Deposit
Tme	Marine Sandstone, Siltstone and Clayey Sandstone (Merced Formation)

EXPLANATION

- RG-7 — Approximate location of boring by Rockridge Geotechnical, June 27, 2023
- TP-1 — Approximate location of test pit by Rockridge Geotechnical, July 18, 2023
- DPT-1 — Approximate location of dynamic penetrometer test by Rockridge Geotechnical, July 18, 2023
- RG-1 — Approximate location of boring by Rockridge Geotechnical, February 2-3, 2022
- EB-1 — Approximate location of boring by Cleary Consultants, Inc., February 2020
- Approximate location of property line
- Approximate location of subdrains shown on Original Site Grading Plan
- A — A' — Idealized subsurface profile

DATE | DESCRIPTION | REV

ROCKRIDGE GEOTECHNICAL
270 Grand Avenue
Oakland, California
(510) 420-5738

EXISTING SITE PLAN AND GEOLOGIC MAP
300 PIEDMONT AVENUE
San Bruno, California

DATE: September 21, 2023
CAD FILE:
PROJECT ENGINEER: Craig Shields
JOB NO: 22-2164
SHEET NO: 2a



EXPLANATION

Qls Existing Shallow Landslide to be Repaired with Remedial Grading

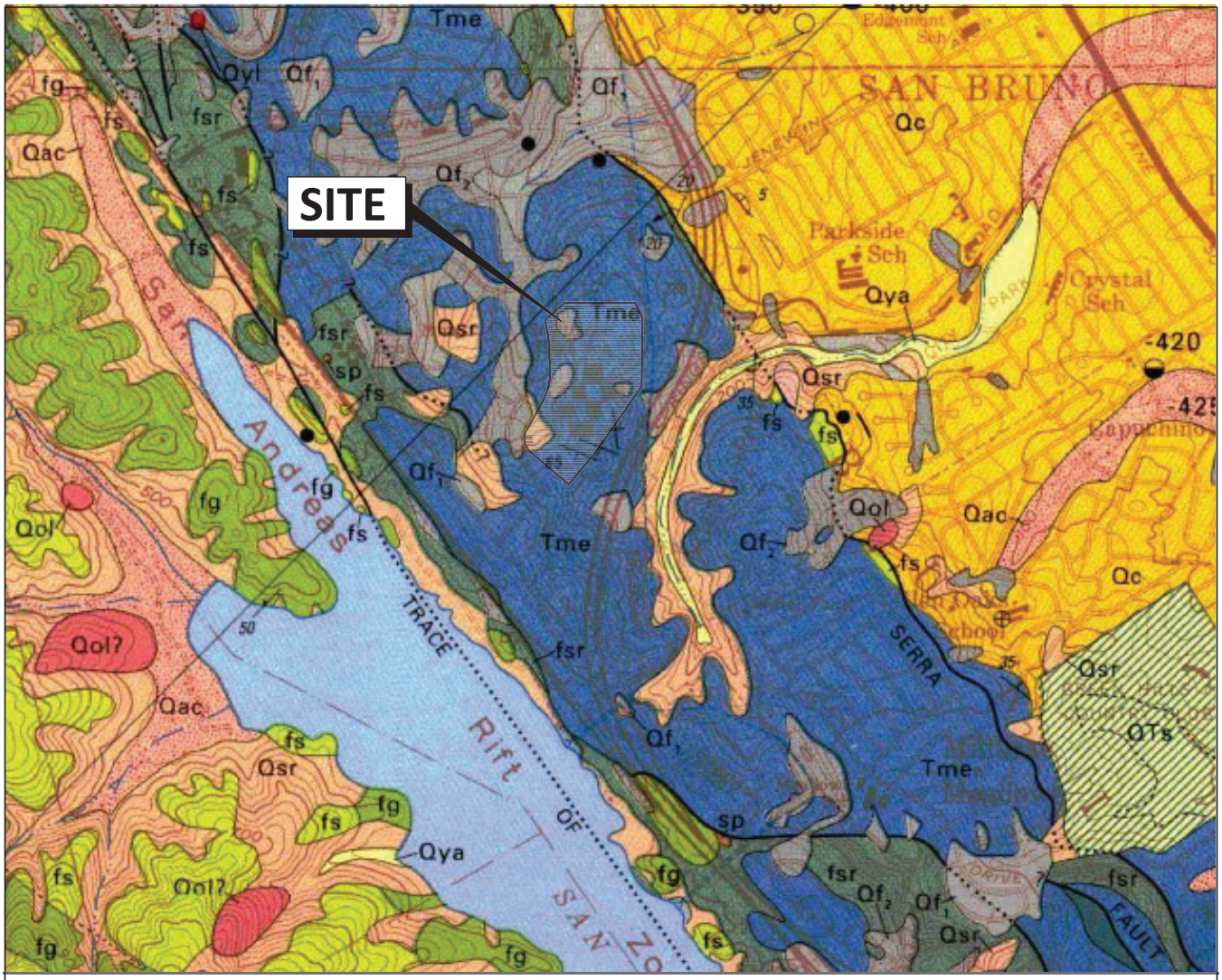
Reference: Base map from a drawing titled "Wall & Remedial Grading", by cbg Civil Engineers, dated August 3, 2023.

300 PIEDMONT AVENUE
San Bruno, California

WALL & REMEDIAL GRADING PLAN

Date 08/07/23	Project No. 22-2164	Figure 2b

ROCKRIDGE GEOTECHNICAL



Reference: Pampeyan, E.H., (1994). Geologic Map of the Montara Mountain and San Mateo 7.5' Quadrangles, San Mateo County, California. USGS Map I-2390.

Explanation

		water
	Qf	Artificial fill
	Qyl	Younger Landslide Deposits - Considered Active and/or unstable
	Qsr	Slope wash & ravine fill
	Tme	Merced Formation (sandstone, siltstone, clayey sandstone)
	fsr	Sheared rock
	fs	Sandstone
	fc	Chert
	fg	Greenstone

N

0 1000 2000 ft

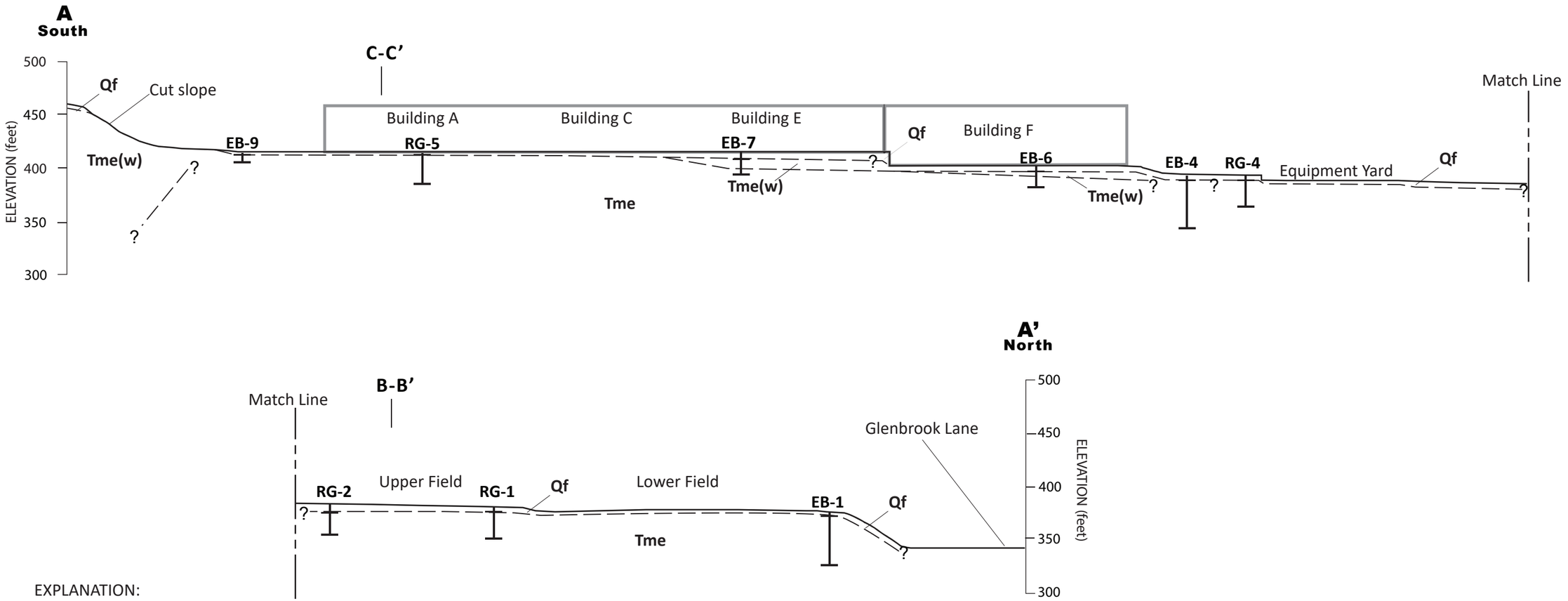
Approximate scale

300 PIEDMONT AVENUE
San Bruno, California

REGIONAL GEOLOGIC MAP

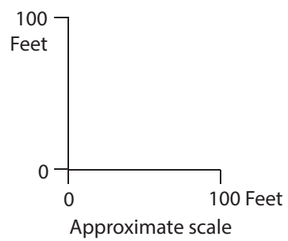
ROCKRIDGE GEOTECHNICAL

Date 07/24/23	Project No. 22-2164	Figure 3



EXPLANATION:

RG-1	Exploratory Boring performed by Rockridge Geotechnical, Inc., February 2022 and June 2023
EB-1	Exploratory Boring performed by Cleary Consultants, Inc., February 2020
Qf	Artificial Fill
Tme(w)	Silty Sandstone, Claystone, brownish yellow, highly weathered (Merced Formation)
Tme	Silty Sandstone, Claystone, gray (Merced Formation)
	Approximate Geologic Contact



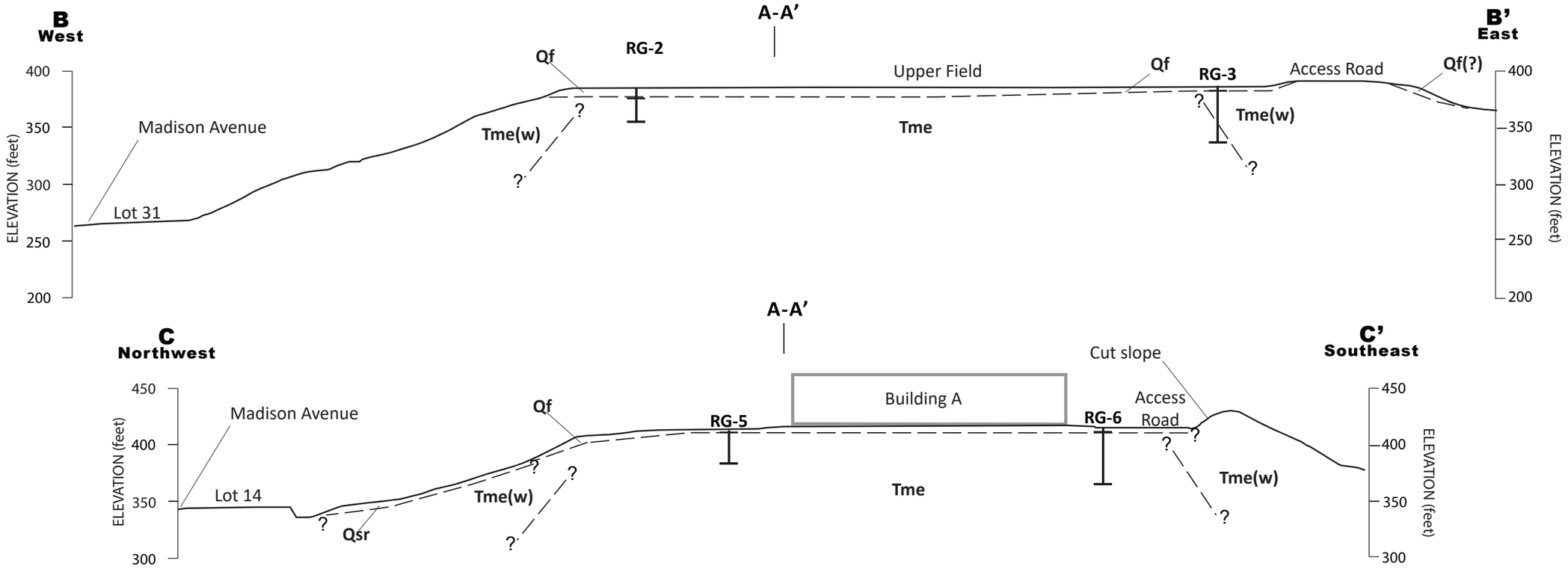
Notes:
1. Geologic interpretation based on limited subsurface exploration, actual conditions may vary and should be verified in the field by a representative from Rockridge Geotechnical.
2. Line of section shown on Existing Site Plan and Geologic Map, Figure 2a.
3. No vertical exaggeration (Horizontal = Vertical Scale).

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

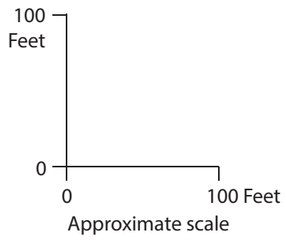
CROSS SECTION A-A'

Date 09/18/23 | Project No. 21-2164 | Figure 4



EXPLANATION:

	RG-1	Exploratory Boring performed by Rockridge Geotechnical, Inc., February 2022 and June 2023
	EB-1	Exploratory Boring performed by Cleary Consultants, Inc., February 2020
	Qf	Artificial Fill
	Qsr	Slope Wash, Ravin Fill and Colluvium
	Tme(w)	Silty Sandstone, Claystone, brownish yellow, highly weathered (Merced Formation)
	Tme	Silty Sandstone, Claystone, gray (Merced Formation)
		Approximate Geologic Contact



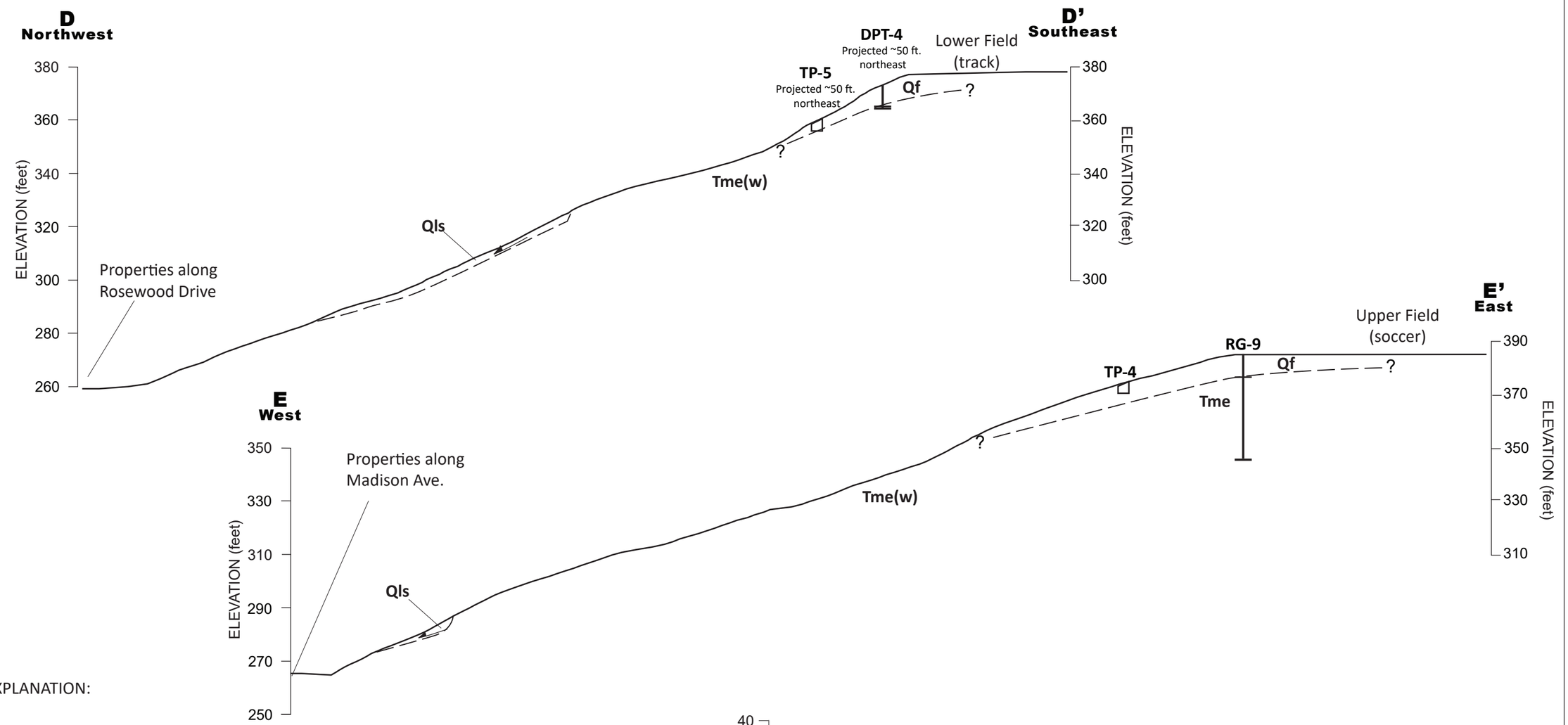
Notes:
1. Geologic interpretation based on limited subsurface exploration, actual conditions may vary and should be verfied in the field by a representative from Rockridge Geotechnical.
2. Line of section shown on Existing Site Plan and Geologic Map, Figure 2a.
3. No vertical exaggeration (Horizontal = Vertical Scale).

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

CROSS SECTIONS B-B' and C-C'

Date 09/18/23 | Project No. 21-2164 | Figure 5



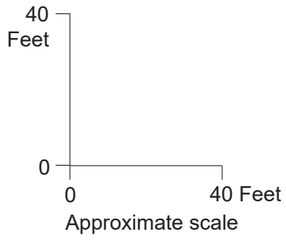
EXPLANATION:

RG-1 Exploratory Boring performed by Rockridge Geotechnical, Inc., February 2022 and June 2023

DPT-1 Dynamic Penetrometer Test performed by Rockridge Geotechnical, Inc., July 2023

TP-1 Test Pit performed by Rockridge Geotechnical, Inc., July 2023

Qf	Artificial Fill
Qls	Landslide (debris flow)
Tme(w)	Silty Sandstone, Claystone, brownish yellow, highly weathered (Merced Formation)
Tme	Silty Sandstone, Claystone, gray (Merced Formation)
	Approximate Geologic Contact



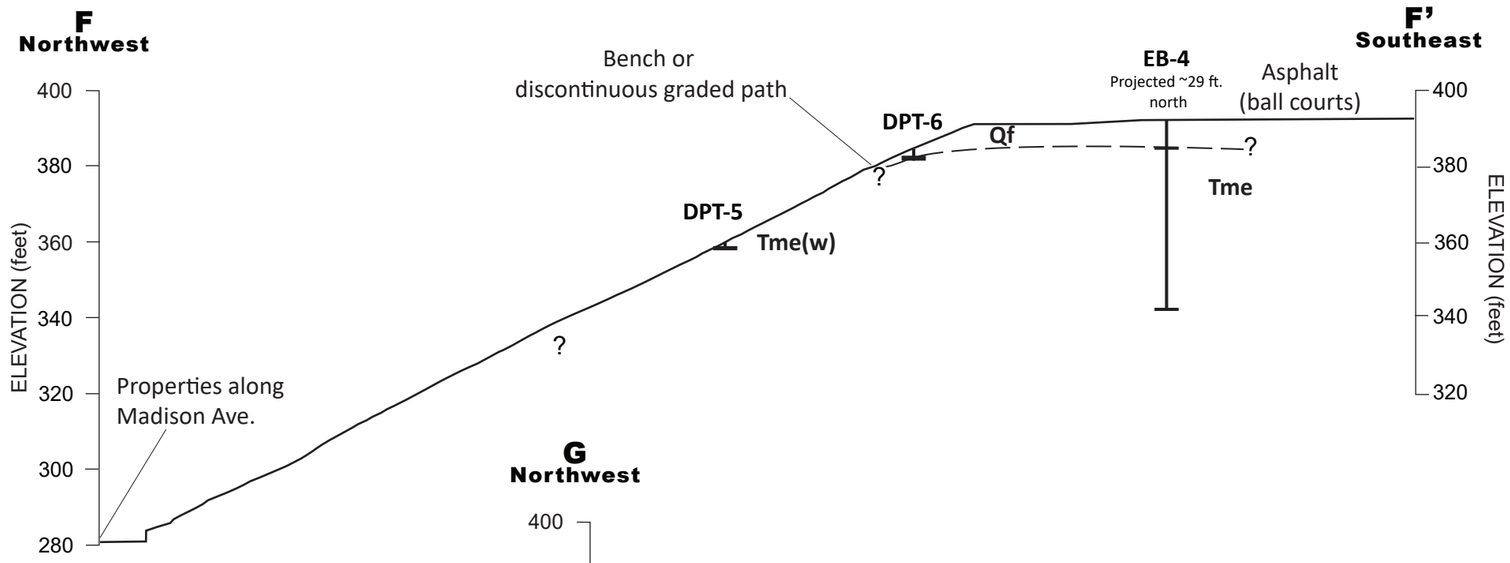
Notes:
1. Geologic interpretation based on limited subsurface exploration, actual conditions may vary and should be verfied in the field by a representative from Rockridge Geotechnical.
2. Line of section shown on Existing Site Plan and Geologic Map, Figure 2a.
3. No vertical exaggeration (Horizontal = Vertical Scale).

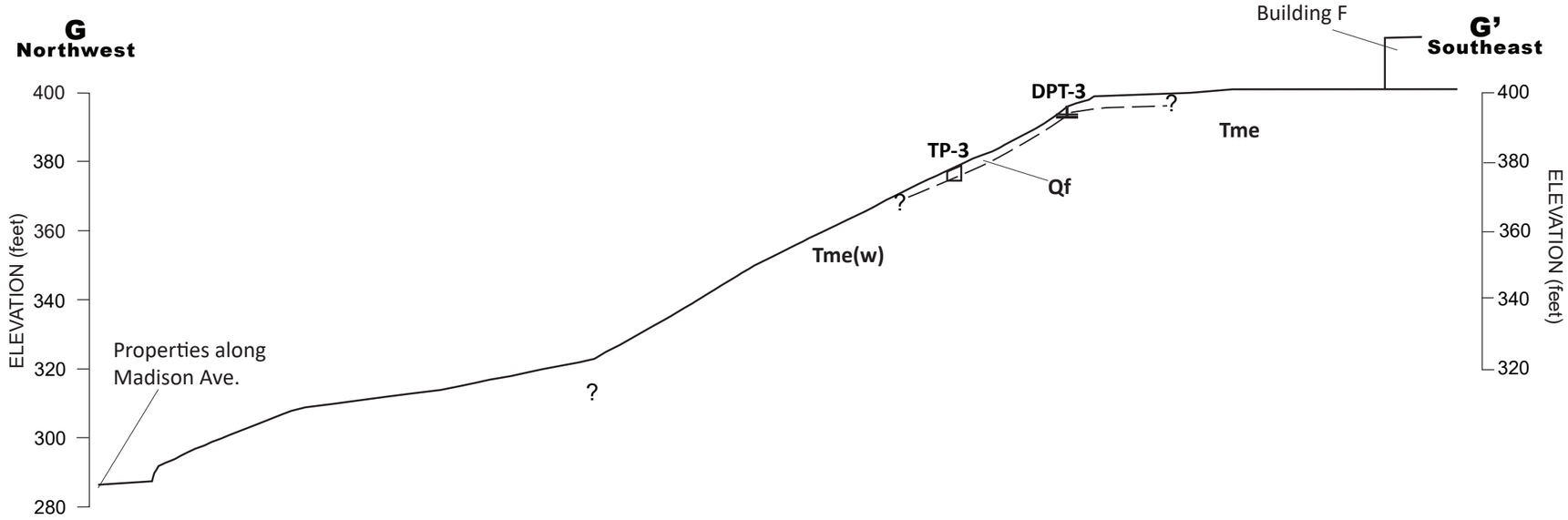
300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

CROSS SECTIONS D-D' AND E-E'

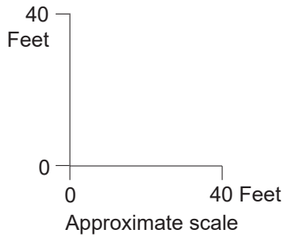
Date 09/18/23 | Project No. 21-2164 | Figure 6





EXPLANATION:

RG-1	Exploratory Boring performed by Rockridge Geotechnical, Inc., February 2022 and June 2023
EB-1	Exploratory Boring performed by Cleary Consultants, Inc., February 2020
DPT-1	Dynamic Penetrometer Test performed by Rockridge Geotechnical, Inc., July 2023
TP-1	Test Pit performed by Rockridge Geotechnical, Inc., July 2023
Qf	Artificial Fill
Tme(w)	Silty Sandstone, Claystone, brownish yellow, highly weathered (Merced Formation)
Tme	Silty Sandstone, Claystone, gray (Merced Formation)
	Approximate Geologic Contact



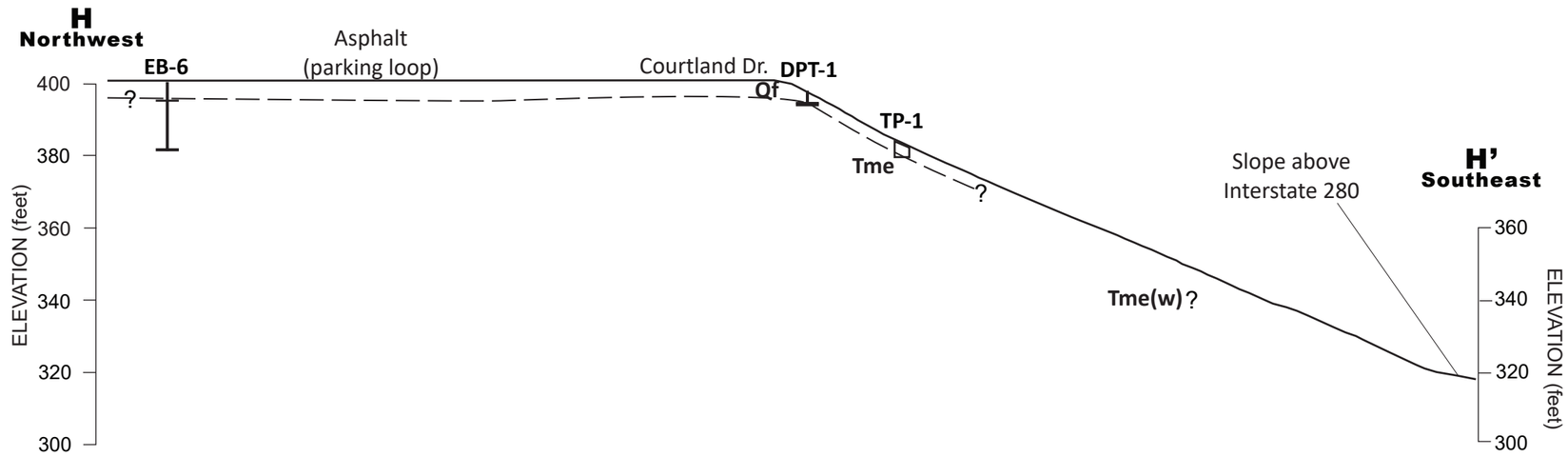
Notes:
1. Geologic interpretation based on limited subsurface exploration, actual conditions may vary and should be verfied in the field by a representative from Rockridge Geotechnical.
2. Line of section shown on Existing Site Plan and Geologic Map, Figure 2a.
3. No vertical exaggeration (Horizontal = Vertical Scale)

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

CROSS SECTIONS F-F' AND G-G'

Date 09/18/23 | Project No. 21-2164 | Figure 7



EXPLANATION:

RG-1 Exploratory Boring
performed by Rockridge Geotechnical, Inc., February 2022 and June 2023

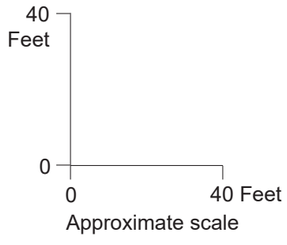
EB-1 Exploratory Boring
performed by Cleary Consultants, Inc., February 2020

DPT-1 Dynamic Penetrometer Test
performed by Rockridge Geotechnical, Inc., July 2023

TP-1 Test Pit
performed by Rockridge Geotechnical, Inc., July 2023

Qf Artifical Fill
Tme(w) Silty Sandstone, Claystone, brownish yellow, highly weathered (Merced Formation)
Tme Silty Sandstone, Claystone, gray (Merced Formation)

Approximate Geologic Contact



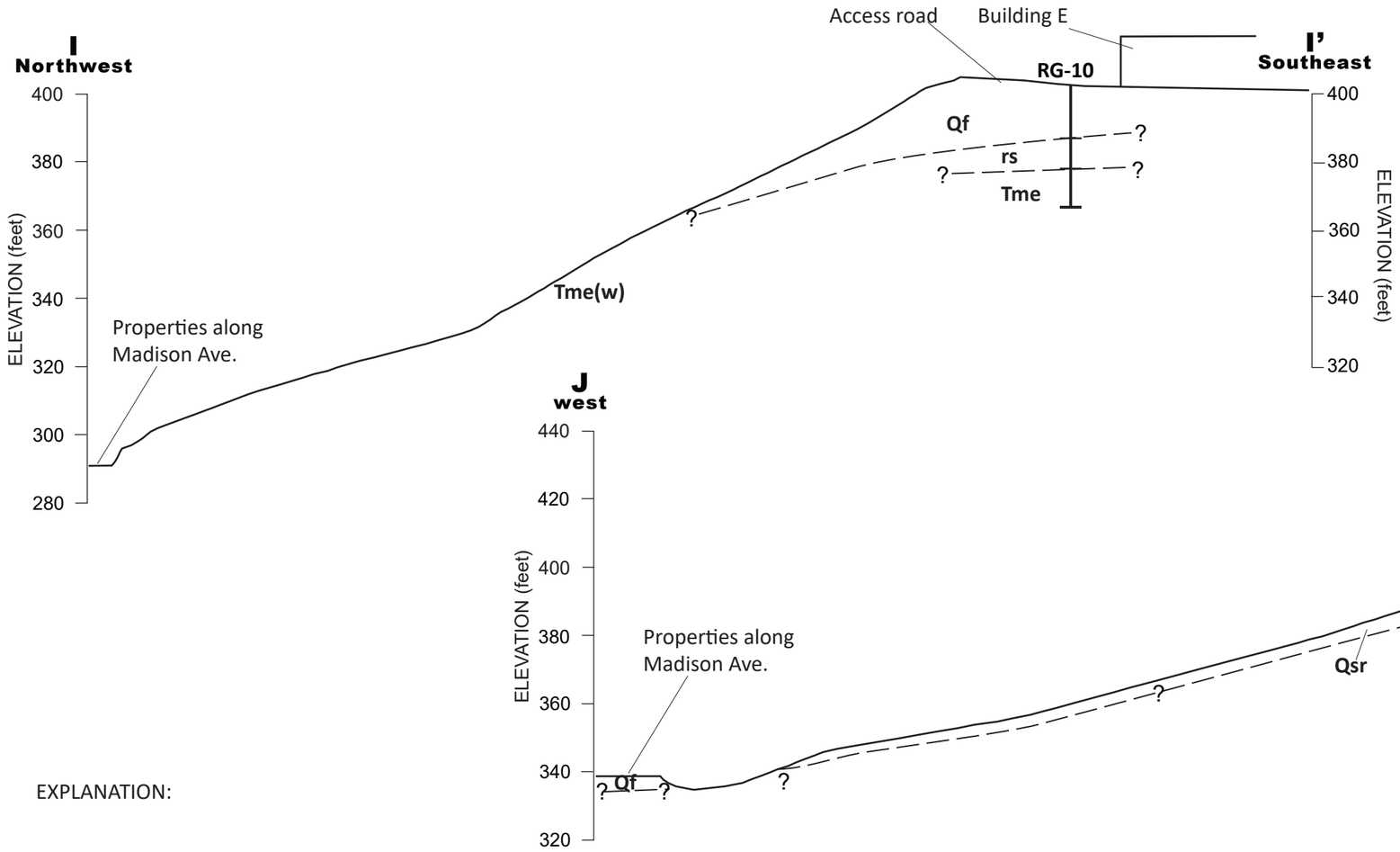
Notes:
1. Geologic interpretation based on limited subsurface exploration, actual conditions may vary and should be verfied in the field by a representative from Rockridge Geotechnical.
2. Line of section shown on Existing Site Plan and Geologic Map, Figure 2a.
3. No vertical exaggeration (Horizontal = Vertical Scale).

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

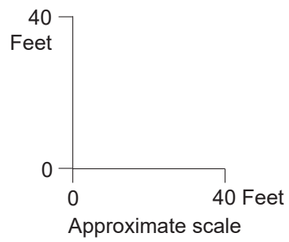
CROSS SECTION H-H'

Date 09/18/23 | Project No. 21-2164 | Figure 8



EXPLANATION:

RG-1	Exploratory Boring performed by Rockridge Geotechnical, Inc., February 2022 and June 2023
EB-1	Exploratory Boring performed by Cleary Consultants, Inc., February 2020
DPT-1	Dynamic Penetration Test performed by Rockridge Geotechnical, Inc., July 2023
TP-1	Test Pit performed by Rockridge Geotechnical, Inc., July 2023
Qf	Artificial Fill
Qsr	Slope Wash, Ravine Fill and Colluvium
rs	Sandy Clay (Completely Weathered Bedrock; Residual Soil)
Tme(w)	Silty Sandstone, Claystone, brownish yellow, highly weathered (Merced Formation)
Tme	Silty Sandstone, Claystone, gray (Merced Formation)
	Approximate Geologic Contact



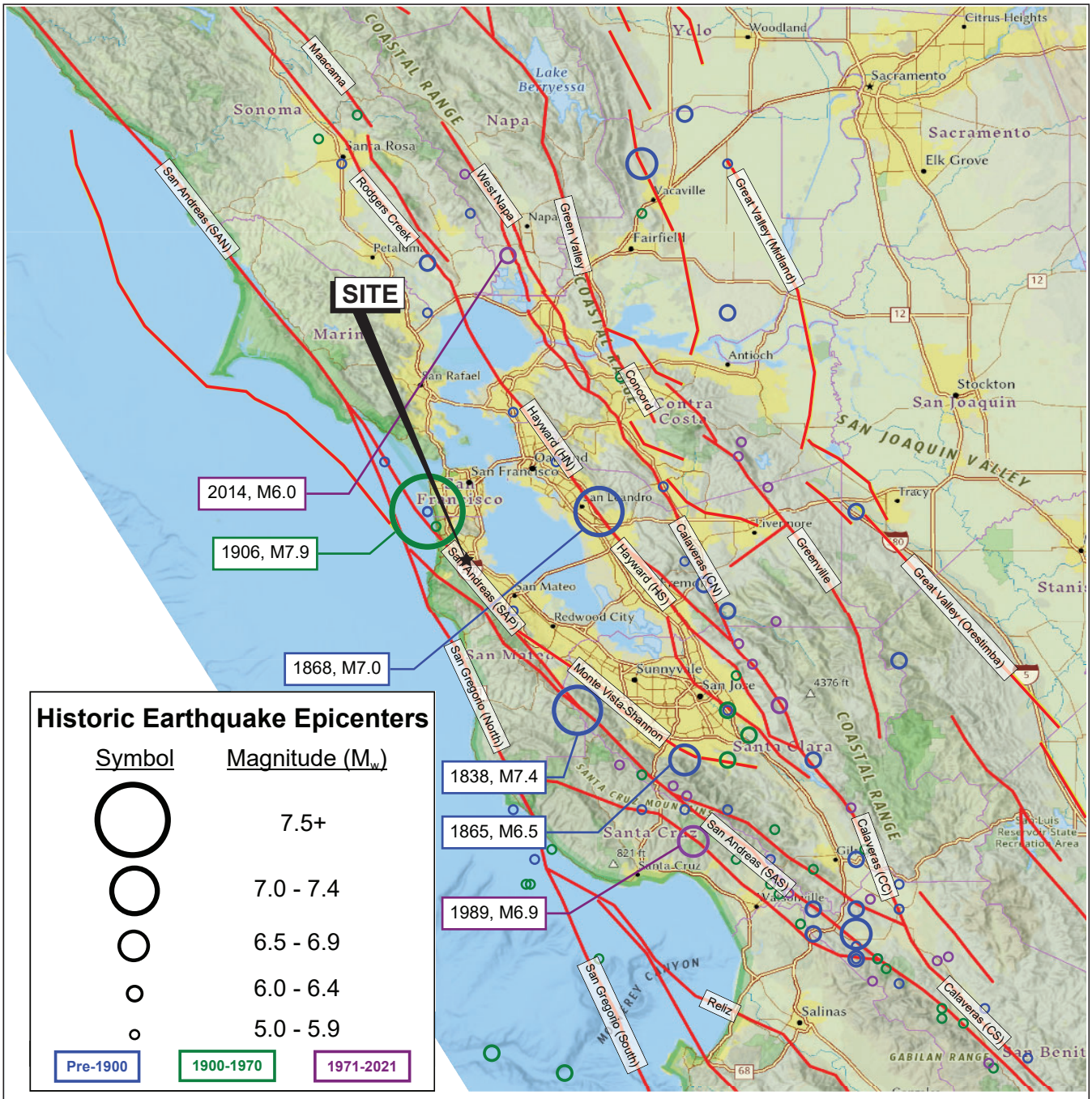
Notes:
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2. Line of section shown on Existing Site Plan and Geologic Map, Figure 2a.
3. No vertical exaggeration (Horizontal = Vertical Scale).

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

CROSS SECTIONS I-I' and J-J'

Date 09/18/23 | Project No. 21-2164 | Figure 9

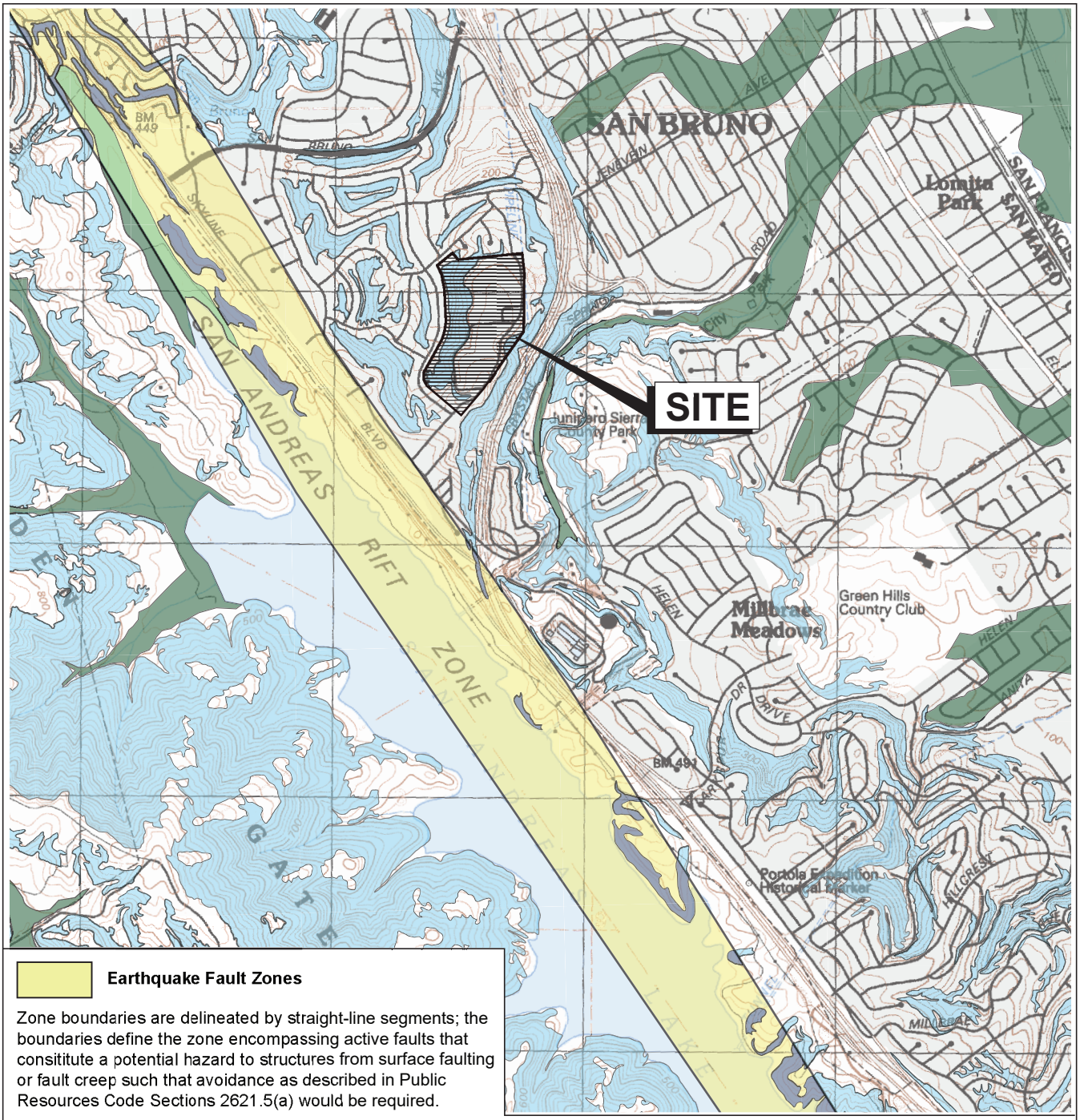


300 PIEDMONT AVENUE
San Bruno, California

REGIONAL FAULT AND HISTORIC SEISMICITY MAP

ROCKRIDGE GEOTECHNICAL

Date 09/18/23	Project No. 22-2164	Figure 10



Earthquake Fault Zones

Zone boundaries are delineated by straight-line segments; the boundaries define the zone encompassing active faults that consititute a potential hazard to structures from surface faulting or fault creep such that avoidance as described in Public Resources Code Sections 2621.5(a) would be required.

Liquefaction Zones

Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Earthquake-Induced Landslide Zones

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.

Reference:
Earthquake Zones of Required Investigation
Montara Mountain Quadrangle
California Geological Survey
Released April 4, 2019

0 2,000 4,000 Feet

Approximate scale

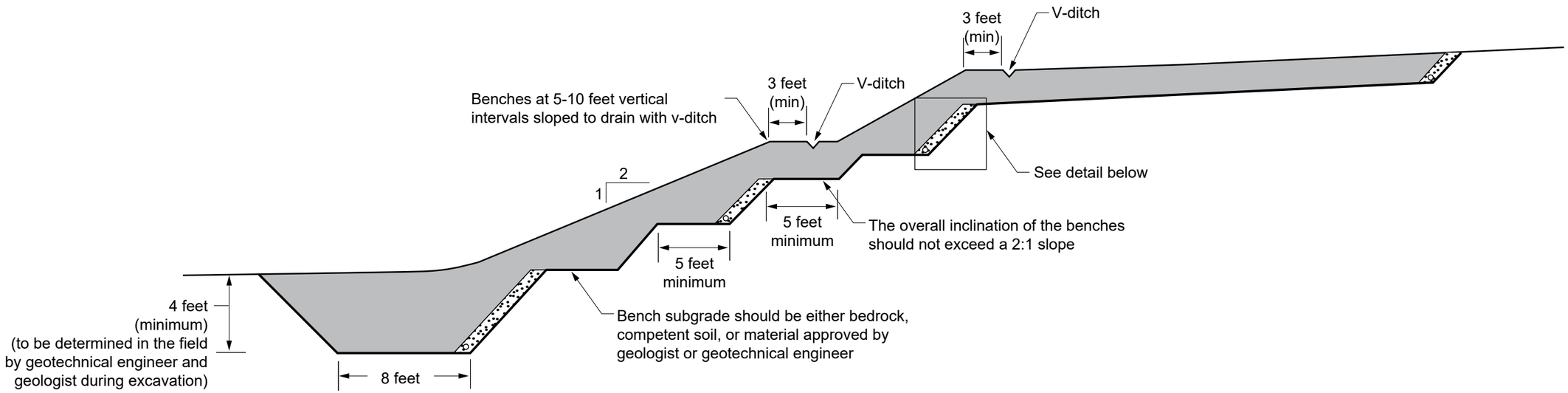
300 PIEDMONT AVENUE
San Bruno, California

EARTHQUAKE ZONES OF REQUIRED INVESTIGATION MAP

ROCKRIDGE GEOTECHNICAL

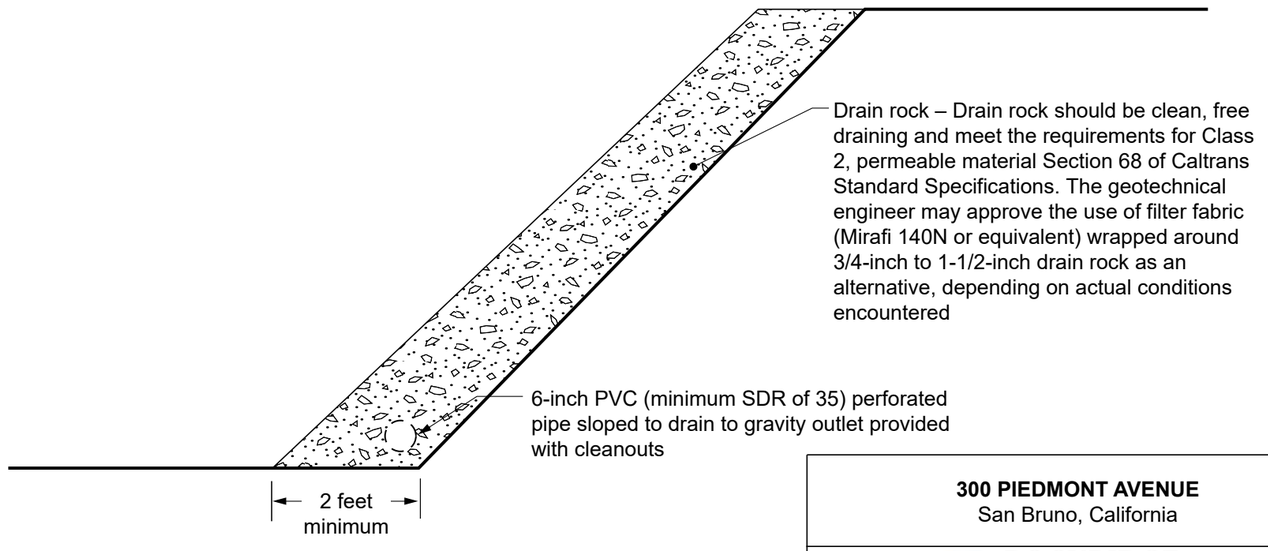
Date 09/18/23	Project No. 22-2164	Figure 11

Typical Buttress/Keyway Section – Fill Slope



Subdrain Detail

(not to scale)



Drawing not to scale; for preliminary design only

300 PIEDMONT AVENUE San Bruno, California	**TYPICAL BUTTRESS/KEYWAY FILL SLOPE**
ROCKRIDGE GEOTECHNICAL	Date 09/18/23 | Project No. 22-2164 | Figure 12

ROCKRIDGE GEOTECHNICAL

APPENDIX A

Logs of Test Borings, Dynamic Penetrometer Test Results, and Test Pit Logs

PROJECT:	**300 PIEDMONT AVENUE** San Bruno, California	**Log of Boring RG-1** PAGE 1 OF 1

Boring location:	See Site Plan, Figure 2	Logged by:	R. Ford
Date started:	02/02/2022	Drilled by:	Exploration Geoservices
Date finished:	02/02/2022	Rig:	Mobile B-61
Drilling method:	8-inch-diameter hollow-stem auger		
Hammer weight/drop:	140 lbs./30 inches	Hammer type:	Downhole Safety Hammer
Sampler:	Modified California (MC), Standard Penetration Test (SPT)		

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
1					SC	CLAYEY SAND (SC) dark brown, moist						
2	MC		5 15 20	22		gray-brown mottled brown and red-brown, medium dense						
3					CL	SANDY CLAY (CL) gray-brown mottled brown and red-brown, hard, moist						
4	SPT		15 15 15	33		Soil Corrosion Test; see Appendix B						
5						SILTY SANDSTONE (SS) gray-brown to gray with red-yellow oxidation, fine sand, low hardness, friable, moderately to deeply weathered, oxidized shell fragments						
6	MC		20 30 50/5"	50/ 11"								
7												
8												
9												
10						gray to dark gray						
11	SPT		17 21 22	47								
12												
13												
14												
15						moist to wet, weakly to moderately cemented						
16	SPT		21 31 36	74	SS							
17						▼ (02/02/2022; 10:30 AM)						
18												
19												
20						wet, fine gravel, moderately weathered						
21	SPT		21 50/5"	78/ 11"								
22												
23												
24												
25						dark gray						
26	SPT		17 21 30	56								
27												
28												
29												
30						trace shell fragments						
31	SPT		21 50/6"	78/ 12"								
32												

FILL

Boring terminated at a depth of 31 feet below ground surface.
Boring backfilled with cement grout.
Groundwater encountered at a depth of 17 feet during drilling.

[1]MC and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.63 and 1.1, respectively, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.:	Figure:
22-2164	A-1

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-2

Boring location: See Site Plan, Figure 2
Date started: 02/02/2022 Date finished: 02/02/2022
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: R. Ford
Drilled by: Exploration Geoservices
Rig: Mobile B-61
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC), Standard Penetration Test (SPT)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
1					SC	CLAYEY SAND (SC) dark brown, moist						
2	MC		11 13 21	21		SILTY SAND (SM) olive-gray mottled yellow-brown and red-yellow, medium dense, moist, shell fragments, trace gravel						
3												
4	SPT		6 7 10	19	SM							
5						orange-brown, fine shells						
6	MC		14 18 18	23								
7						dark gray with red-yellow oxidation						
8	SPT		4 6 18	26								
9					SP-SM	SAND with SILT (SP-SM) gray to dark gray with yellow-red red-brown oxidation, very dense, moist, fine sand, shell fragments, weakly to moderately cemented silty sandstone locally						
10	SPT		50/6"	55/6"								
11												
12						SILTY SANDSTONE (SS) dark gray, low hardness, friable, moderately weathered, moderately cemented, shell fragments						
13												
14												
15												
16	SPT		18 24 24	53								
17												
18												
19												
20												
21	SPT		18 24 46	77	SS							
22												
23												
24												
25												
26	SPT		18 36 26	68								
27												
28												
29												
30	SPT		50/6"	55/6"		abundant shell fragments						
31												
32												

FILL

Boring terminated at a depth of 30.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1]MC and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.63 and 1.1, respectively, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-2

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-3

Boring location: See Site Plan, Figure 2
Date started: 02/02/2022 Date finished: 02/02/2022
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: R. Ford
Drilled by: Exploration Geoservices
Rig: Mobile B-61
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC), Standard Penetration Test (SPT)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
1–2	MC		21 21 30	32		SILTY SAND (SM) yellow-brown with red-brown to yellow-red oxidation, dense, moist, fine sand						
3–4	SPT		16 21 24	50		very dense, weakly cemented						
5–6	MC		18 50/6"	43/ 12"		zones of yellow-brown, moderately cemented, friable silty sandstone						
7–8												
9–10												
10–11	SPT		18 18 14	35		dense, weakly cemented						
12–13												
14–15	SPT		20 50/5"	77/ 11"	SM	yellow, very dense						
16–17												
18–19												
20–21	SPT		20 50/6"	77/ 12"		yellow-brown with trace red to red-brown oxidation						
22–23												
24–25												
26–27	SPT		21 26 36	68		faint rock structure, vertical fractures with red iron stain, friable sandstone locally, notable increase in oxidation						
28–29												
30–31	SPT		21 26 40	73		yellow-brown, weakly cemented to friable sandstone locally						
32												

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-3a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-3

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
33						SILTY SAND (SM) (continued)						
34												
35	SPT		22 50/6"	79/ 12"	SM	olive to olive-gray mottled with yellow-red oxidation, faint rock structure						
36												
37												
38												
39												
40						moist to wet						
41	SPT		28 28 50	86								
42					SP-SM	SAND with SILT (SP-SM) gray, very dense, moist, fine sand, abundant shell fragments, weakly cemented						
43												
44						SILTY SANDSTONE (SS) low hardness, friable, moderately weathered wet zone at 45-45.5 feet						
45	SPT		40 50/6"	99/ 12"								
46												
47					SS							
48												
49												
50	SPT		50/4"	55/4"								
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												

Boring terminated at a depth of 50.3 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1]MC and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.63 and 1.1, respectively, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-3b

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-4

Boring location: See Site Plan, Figure 2
Date started: 02/02/2022 Date finished: 02/02/2022
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: R. Ford
Drilled by: Exploration Geoservices
Rig: Mobile B-61
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC), Standard Penetration Test (SPT)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
0						1-2 inches of asphalt concrete						
1	MC		10 16 26	26	SM	SILTY SAND (SM) yellow-brown mottled olive-gray and red-yellow, medium dense, moist Soil Corrosion Test; see Appendix B						
2												
3	SPT		7 12 18	33								
4												
5	MC		20 30 50/4"	50/ 10"	SP-SM	SAND with SILT (SP-SM) gray-brown, dense, moist						
6												
7	SPT		19 30 50	88		SANDSTONE (SS) gray to gray-brown with red-yellow oxidation, fine sand, low hardness, friable, moderately cemented, moderately weathered, trace shell fragments						
8												
9						weakly cemented						
10	SPT		50/6"	55/6"								
11						dark gray, moderately cemented						
12					SS							
13												
14												
15	SPT		32 50/6"	90/ 12"								
16												
17												
18												
19						SILTY SANDSTONE (SS) dark gray to dark green-gray, low hardness, friable, moderately weathered, zones of weakly cemented very dense silty sand, trace shell fragments						
20	SPT		28 31 41	79								
21												
22												
23												
24					SS							
25	SPT		32 50/6"	90/ 12"								
26												
27												
28												
29												
30	SPT		30 50/4"	88/ 10"								
31												
32												

FILL

Boring terminated at a depth of 30.8 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1] MC and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.63 and 1.1, respectively, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-4

PROJECT:	**300 PIEDMONT AVENUE** San Bruno, California	**Log of Boring RG-5** PAGE 1 OF 1

Boring location:	See Site Plan, Figure 2	Logged by:	R. Ford
Date started:	02/03/2022	Drilled by:	Exploration Geoservices
Date finished:	02/03/2022	Rig:	Mobile B-61
Drilling method:	8-inch-diameter hollow-stem auger		
Hammer weight/drop:	140 lbs./30 inches	Hammer type:	Downhole Safety Hammer
Sampler:	Modified California (MC), Standard Penetration Test (SPT)		

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
						asphalt						
1	MC		50/6"	32/6"		SILTY SANDSTONE (SS) yellow-brown with yellow-red oxidation, low hardness, friable, moderately to highly weathered, moderately cemented						
2												
3	SPT		25 50/4"	90/ 12"								
4						gray to dark gray, moderately weathered, shell fragments						
5	SPT		30 50/4"	83/ 10"								
6												
7												
8												
9												
10	SPT		50/6"	55/6"		weakly cemented						
11												
12												
13												
14												
15	SPT		50/5"	55/5"	SS							
16												
17												
18												
19												
20	SPT		50/6"	55/6"		weakly to moderately cemented						
21												
22												
23												
24												
25	SPT		50/6"	55/6"								
26												
27												
28												
29												
30	SPT		50/6"	55/6"								
31												
32												

Boring terminated at a depth of 30.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1]MC and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.63 and 1.1, respectively, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.:	Figure:
22-2164	A-5

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-6

Boring location: See Site Plan, Figure 2
Date started: 02/03/2022 Date finished: 02/03/2022
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: R. Ford
Drilled by: Exploration Geoservices
Rig: Mobile B-61
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC), Standard Penetration Test (SPT)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
0						1 inch of asphalt						
						8 inches of aggregate base						
1	MC		20 50/6"	44/ 12"		SILTY SANDSTONE (SS) gray-brown and dark yellow-brown with red oxidation, low hardness, friable, moderately to highly weathered, shell fragments						
2												
3												
4	SPT		25 40 50/6"	99/ 12"		blue-gray, moderately weathered						
5	MC		15 50/4"	72/ 10"		gray, weakly to moderately cemented						
6												
7												
8												
9												
10	SPT		25 50/6"	83/ 12"								
11												
12												
13												
14												
15	SPT		50/6"	55/6"	SS	gray to dark gray, decreased shell fragments						
16												
17												
18												
19												
20	SPT		50/6"	55/6"		olive-gray to dark gray, increased shell fragments						
21												
22												
23												
24												
25	SPT		50/6"	55/6"		weakly cemented						
26												
27												
28												
29												
30	SPT		50/6"	55/6"		dark green-gray, moderately cemented						
31												
32												

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-6a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-6

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
33						SILTY SANDSTONE (SS) (continued)						
34												
35												
36	SPT		50/4"	55/4"		dark green-gray, moderately cemented						
37												
38												
39												
40	SPT		50/5"	55/5"		dark gray, weakly cemented, shale fragments						
41					SS							
42												
43												
44												
45	SPT		50/6"	55/6"		moderately cemented, increased rock structure						
46												
47												
48												
49												
50	SPT		50/6"	55/6"		weakly cemented						
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												
61												
62												
63												
64												

Boring terminated at a depth of 50.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1]MC and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.63 and 1.1, respectively, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-6b

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-7

Boring location: See Site Plan, Figure 2
Date started: 06/27/2023 Date finished: 06/27/2023
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: J. Graham
Drilled by: Exploration Geoservices, Inc.
Rig: Mobile B61
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
						Topsoil						
1–5	MC		25 30 32	39	SM	SILTY SAND with GRAVEL (SM) yellow-brown, dense, moist, fine to coarse sand, fine to coarse subangular gravel, rootlets						
3–5	MC		16 19 22	26	SM	medium dense FILL						
5–6	MC		12 24 35	37	CL	SANDY CLAY (CL) yellow-brown, hard, moist, fine sand, rootlets						
7–8	MC		28 50/4"	32/4"	SM	SILTY SAND (SM) yellow-brown mottled with yellow, very dense, moist, fine sand, rootlets, rock fragments						
10–12	MC		13 18 21	25	SM	SILTY SAND (SM) red-yellow, medium dense, moist, fine sand Direct Shear Test; see Appendix B	DS	500 1,000 2,000	408 1,114 1,788		16.1 19.5 17.6	89 97 88
15–16	MC		26 50/5"	32/5"	ML	SANDY SILT (ML) yellow-brown, hard, moist, fine sand, trace shells [SILTY SANDSTONE] TxUU Test; see Appendix B Particle Size Distribution; see Appendix B	TxUU	2,000	5,600	66	16.9	114
20–21	MC		36 50/4"	32/4"	SM	SILTY SAND (SM) olive, very dense, moist, fine sand [SILTY SANDSTONE]						
25–26	MC		48 50/3"	32/3"	SM	SILTY SAND (SM) olive-brown, very dense, moist, fine sand [SILTY SANDSTONE]						

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-7a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-7

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
30	MC		50/6"	32/6"	SM	SILTY SAND (SM) (continued)						
31						SILTY SAND (SM) gray, very dense sand, moist [SILTY SANDSTONE]						
32												
33					SM							
34												
35												
36	MC		37 50/5"	32/5"								
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												

Boring terminated at a depth of 36 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1] MC blow count for the last two increments were converted to SPT N-Values using a factor of 0.63 to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-7b

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-8

Boring location: See Site Plan, Figure 2
Date started: 06/27/2023 Date finished: 06/27/2023
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: C. Velasquez
Drilled by: Exploration Geoservices, Inc.
Rig: Mobile B61
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
0						Topsoil						
1	MC		18 21 26	30	ML	SANDY SILT (ML) yellow-brown, very stiff, moist, fine to coarse sand, trace fine to coarse subangular gravel, rootlets Particle Size Distribution; see Appendix B				79	7.4	114
2												
3	MC		11 21 21	26	CL	SANDY CLAY (CL) brown, very stiff, moist, coarse to fine sand, trace fine subangular gravel						
4					SC-SM	SILTY, CLAYEY SAND (SC-SM) yellow-brown, medium dense, moist, fine sand						
5	MC		11 30 50/4"	50/ 10"	SM	SILTY SAND (SM) olive-brown, very dense, moist, fine sand [SILTY SANDSTONE]						
6												
7	MC		23 40 48	55		SILT (ML) gray, hard, moist, medium to fine sand, trace fine subangular gravel [SILTY SANDSTONE] Particle Size Distribution; see Appendix B				89	17.7	112
8												
9												
10	MC		25 38 50	55								
11												
12												
13												
14												
15	MC		12 15 22	23	ML							
16												
17												
18												
19												
20	MC		30 50/5"	32/5"		shells in sample						
21												
22												
23												
24												
25	MC		36 40 50/3"	57/9"		SAND with SILT (SP-SM) gray, very dense, moist, fine sand, trace coarse subangular gravel, shell fragments [SILTY SANDSTONE]						
26					SP-SM							
27												
28												
29												
30												

FILL

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-8a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-8

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	MC		34 50/5"	32/5"	SP-SM	SAND with SILT (SP-SM) (continued) increase in shell fragments						
32												
33												
34												
35	MC		48 50/4"	32/4"								
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												

Boring terminated at a depth of 36 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1] MC blow count for the last two increments were converted to SPT N-Values using a factor of 0.63 to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-8b

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-9

Boring location: See Site Plan, Figure 2
Date started: 06/27/2023 Date finished: 06/27/2023
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: C. Velasquez
Drilled by: Exploration Geoservices, Inc.
Rig: Mobile B61
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC)

DEPTH (feet)	Sampler Type	Sample	Blows/ 6"	SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
0						Topsoil						
1	MC		25	62/	SM	SILTY SAND with GRAVEL (SM)						
2			49	11"		yellow-brown, very dense, moist, coarse to fine sand, coarse to fine subangular gravel						
3	MC		27	47								
4			36		SM	SILTY SAND (SM)						
5			38			olive-brown, dense, moist, trace subangular gravel FILL						
6	MC		19	33	SP-SM	SAND with SILT (SP-SM) yellow-brown, dense, moist, fine sand, trace coarse subrounded gravel, shells present						
7			22			olive-brown						
8	MC		13	26	ML	SANDY SILT (ML) gray, very stiff, moist, coarse to fine sand, shells	DS	500	1,008		15.0	113
9			9			Direct Shear Test; see Appendix B		1,000	1,512		16.2	111
10	MC		33					2,000	2,412		19.1	107
11			40	32/5"		SANDY SILT (ML) yellow-brown, hard, moist, fine sand, trace fine subangular gravel [SILTY SANDSTONE]						
12			50/5"		ML							
13												
14												
15	MC		50/6"	32/6"		SANDY SILT (ML) gray, hard, moist, fine sand, trace fine subangular gravel [SILTY SANDSTONE]	TxUU	1,950	6,170	64	13.2	117
16						Particle Size Distribution; see Appendix B						
17					ML							
18												
19												
20	MC		50/5"	32/5"		SILTY SAND (SM)	DS	500	1,092		12.2	106
21						gray, very dense, moist, medium to fine sand [SILTY SANDSTONE]		1,000	1,866		12.2	109
22					SM	Direct Shear Test; see Appendix B		2,000	3,180		12.9	111
23												
24												
25	MC		30	32/5"		SAND with SILT (SP-SM)						
26			50/5"			gray, very dense, moist, fine sand, shell fragments [SILTY SANDSTONE]						
27					SP-SM							
28												
29												
30												

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164 Figure: A-9a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-9

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	MC		50/6"	32/6"	SP-SM	SAND with SILT (SP-SM) (continued)						
32												
33												
34												
35	MC		50/6"	32/6"								
36												
37												
38												
39	MC		50/6"	32/6"								
40												
41												
42												
43												
44												
45												
46												
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Boring terminated at a depth of 39 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1] MC blow count for the last two increments were converted to SPT N-Values using a factor of 0.63 to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-9b

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-10

Boring location: See Site Plan, Figure 2
Date started: 06/29/2023 Date finished: 06/29/2023
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: C. Velasquez
Drilled by: Exploration Geoservices, Inc.
Rig: Mobile B40
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION		LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
0						2 inches of asphalt concrete							
						4 inches of aggregate base							
1–4	GRAB				SM	SILTY SAND with GRAVEL (SM) olive-brown, coarse to fine sand, moist, fine to coarse subrounded gravel							
5–6	MC		18 33 48	51	SM	SILTY SAND with GRAVEL (SM) yellow-brown mottled, very dense, moist, coarse subangular to subrounded gravel Soil Corrosivity Test; see Appendix B							
7–8	MC		23 16 17	21	SM	SILTY SAND with GRAVEL (SM) olive mottled with pale yellow and red-yellow, medium dense, moist, fine sand, fine subangular gravel fragments	FILL						
9–11	MC		21 17 24	26	SM	SILTY SAND (SM) olive, gray, dark gray-brown, medium sand, moist, fine sand, with fine subrounded gravel and clay pockets							
12–16	MC		9 11 13	15	SM	Direct Shear Test; see Appendix B		DS	500	1,044		13.8	115
16–17						SANDY CLAY (CL) brown, yellow-red, yellow, gray mottled, very stiff, moist, fine sand			1,000	1,788		12.9	118
17–18									2,000	2,796		12.6	116
19–21	MC		10 10 17	17	CL	red-yellow and pale yellow mottled light gray and dark brown, wih organic rootlets casts LL = 31, PI = 16; see Appendix B	RESIDUAL SOIL	TxUU	2,750	2,640		22.1	104
22–25	MC		25 41 50/5"	57/ 11"	Tme	CLAYEY SAND (SC) red-yellow, very dense, moist, fine sand, trace fine subangular gravel, with shell fragments [SANDSTONE]	BEDROCK						
26–30													

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-10a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-10

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	MC		26 50/3"	32/3"	Tme	SILTY SAND (SM) gray, very dense, moist, fine sand [SILTY SANDSTONE]						
32												
33												
34												
35	MC		37 50/2"	32/2"		BEDROCK						
36												
37												
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Boring terminated at a depth of 35.75 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1]MC blow count for the last two increments were converted to SPT N-Values using a factor of 0.63 to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-10b

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-11

Boring location: See Site Plan, Figure 2
Date started: 06/28/2023 Date finished: 06/29/2023
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: C. Velasquez
Drilled by: Exploration Geoservices, Inc.
Rig: Mobile B61 and B40
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC), Standard Penetration Test (SPT), Hand-Auger (HA)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION
0						Topsoil
2	GRAB				SC	CLAYEY SAND with GRAVEL (SC) olive-brown, moist, subrounded gravel present Resistance Value Test; see Appendix B
4						FILL
5	GRAB				SC	CLAYEY SAND (SC) yellow-brown, trace gravel, increase in fines contents
7	MC		35 50/5"	32/5"	SM	SILTY SAND (SM) red-yellow, very dense, moist, fine sand, calcite veins [SILTY SANDSTONE]
10	MC		40 50/3"	32/3"		SILTY SAND (SM) yellow-brown, very dense, moist, some calcited material, fine sand [SILTY SANDSTONE]
15	MC		50/6"	32/6"	SM	
20	MC		50/6"	32/6"		
25	MC		46 50/2"	32/2"		SILTY SAND (SM) yellow-brown, very dense, moist, fine sand [SILTY SANDSTONE]
27					SM	
30						

LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-5a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-11

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	MC		49 50/3"	32/3"	SM	SILTY SAND (SM) olive-brown, very dense, moist, fine sand [SILTY SANDSTONE]						
32												
33												
34												
35	SPT		50/3"	32/3"	SP	SAND with GRAVEL (SP) olive-gray, very dense, moist, fine sand, coarse to fine angular gravel [SILTY SANDSTONE]						
36												
37												
38												
39												
40												
41												
42												
43												
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Boring terminated at a depth of 36 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1]MC blow count for the last two increments were converted to SPT N-Values using a factor of 0.63 to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-11b

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-12

Boring location: See Site Plan, Figure 2
Date started: 06/29/2023 Date finished: 06/29/2023
Drilling method: 8-inch-diameter hollow-stem auger
Logged by: C. Velasquez
Drilled by: Exploration Geoservices, Inc.
Rig: Mobile B40
Hammer weight/drop: 140 lbs./30 inches Hammer type: Downhole Safety Hammer
Sampler: Modified California (MC), Hand-Auger (HA)

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content,%	Dry Density Lbs/Cut Ft
1						Topsoil						
2					SP	SAND (SP) light brown, moist, fine sand FILL						
3	GRAB											
4												
5	MC		48 50/2"	32/2"	SM	SILTY SAND (SM) light brown, very dense, molist, fine sand [SILTY SANDSTONE]						
6												
7	MC		50/5"	32/5"		SILT with SAND (ML) gray, hard, moist, fine sand [SILTY SANDSTONE] Laboratory Compaction Test; see Appendix B Particle Size Distribution; see Appendix B Soil Corrosivity Test; see Appendix B				83	12.7	120
8												
9												
10	MC		38 50/5"	32/5"	ML							
11												
12												
13												
14												
15												
16	MC		14 22 30	33		SANDY SILT (ML) gray, hard, moist, fine to medium sand, pocket of clay fragments shells occasionally, increase in fines [SILTY SANDSTONE]	TxUU	2,000	1,350	70	12.5	117
17					ML	Particle Size Distribution; see Appendix B						
18												
19												
20	MC		31 50/4"	32/4"		SILTY SAND (SM) gray, very dense, moist, fine to medium sand [SILTY SANDSTONE]					14.1	
21												
22												
23												
24												
25	MC		50/4"	32/4"	SM							
26												
27												
28												
29												
30												

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164
Figure: A-12a

PROJECT: **300 PIEDMONT AVENUE**
San Bruno, California

Log of Boring RG-12

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31					SM	SILTY SAND (SM) (continued)						
32												
33												
34												
35	MC		50/6"	32/6"								
36												
37												
38												
39												
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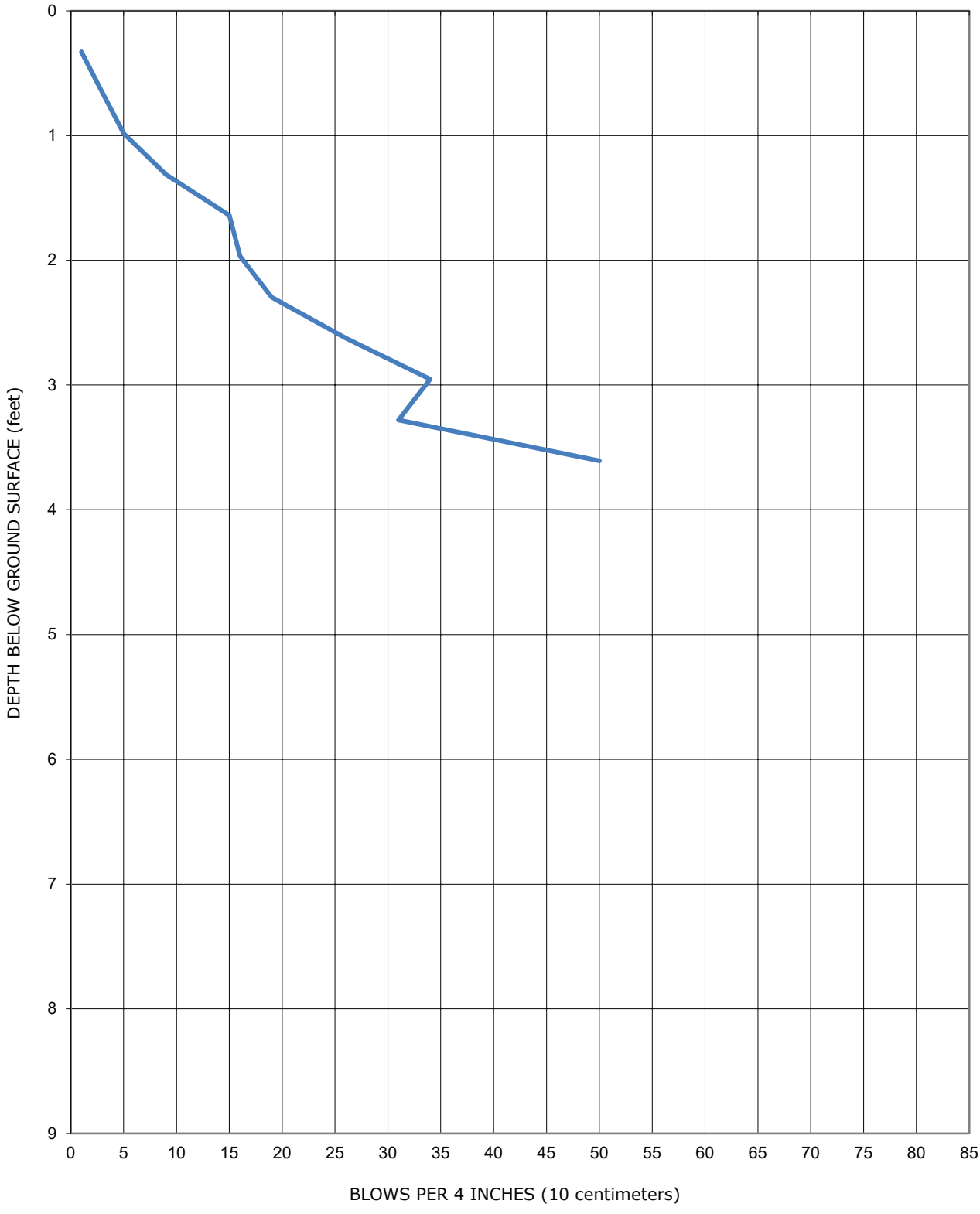
Boring terminated at a depth of 35.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater not encountered during drilling.

[1] MC blow count for the last two increments were converted to SPT N-Values using a factor of 0.63 to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 22-2164

Figure: A-12b

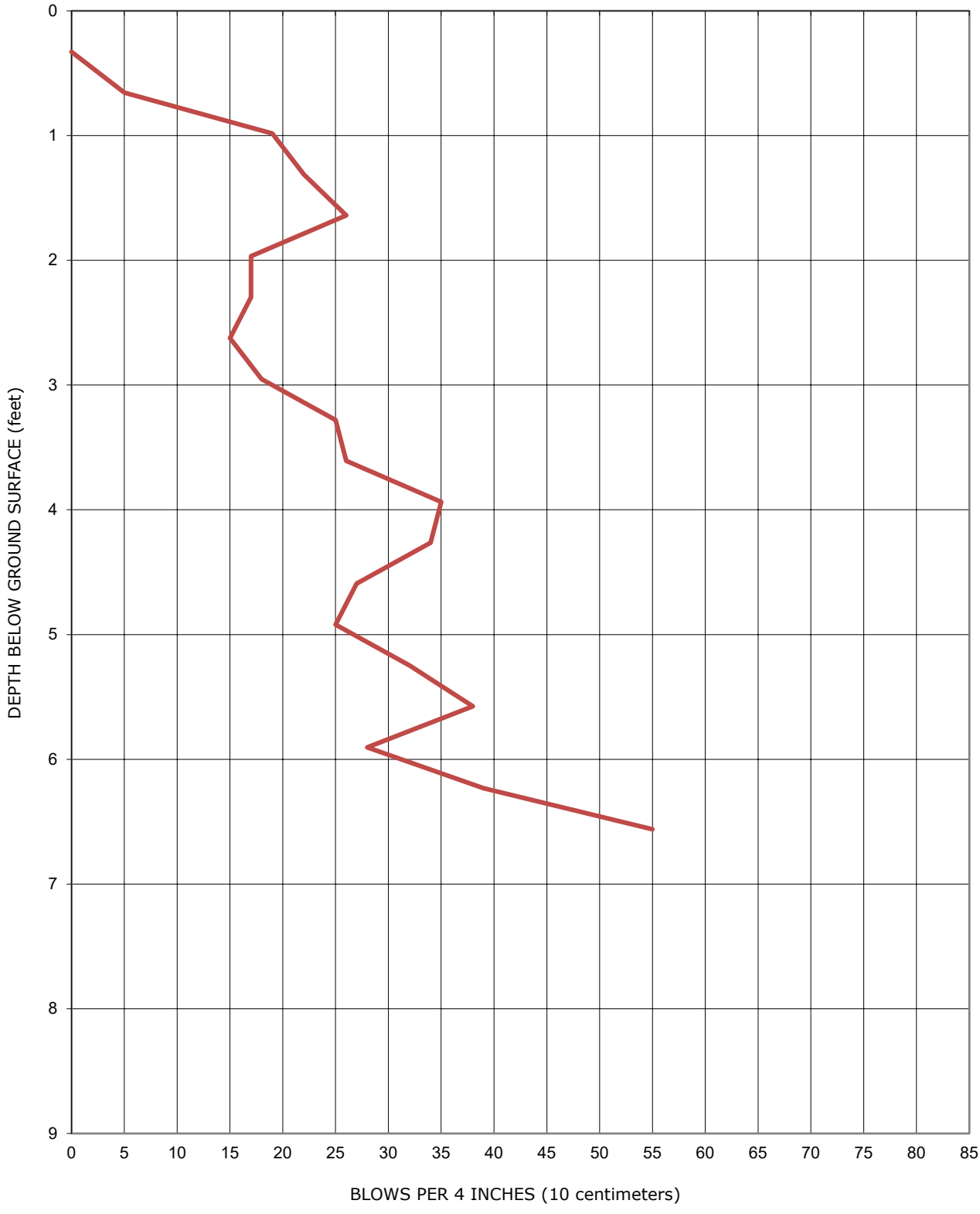


300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

DYNAMIC PENETROMETER TEST RESULTS
DPT-1

Date 07/24/23	Project No. 22-2164	Figure A-13

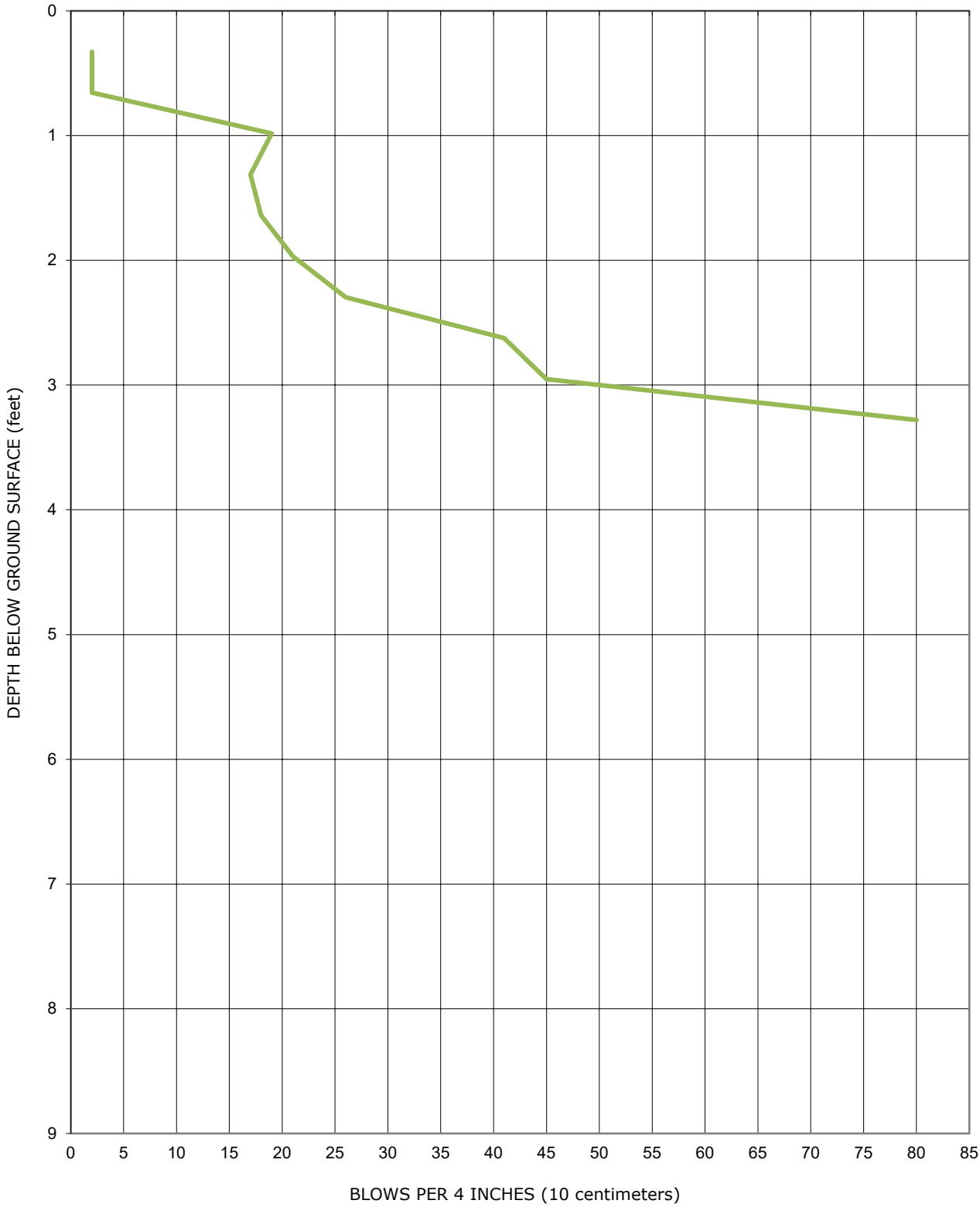


300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

DYNAMIC PENETROMETER TEST RESULTS
DPT-2

Date 07/24/23	Project No. 22-2164	Figure A-14

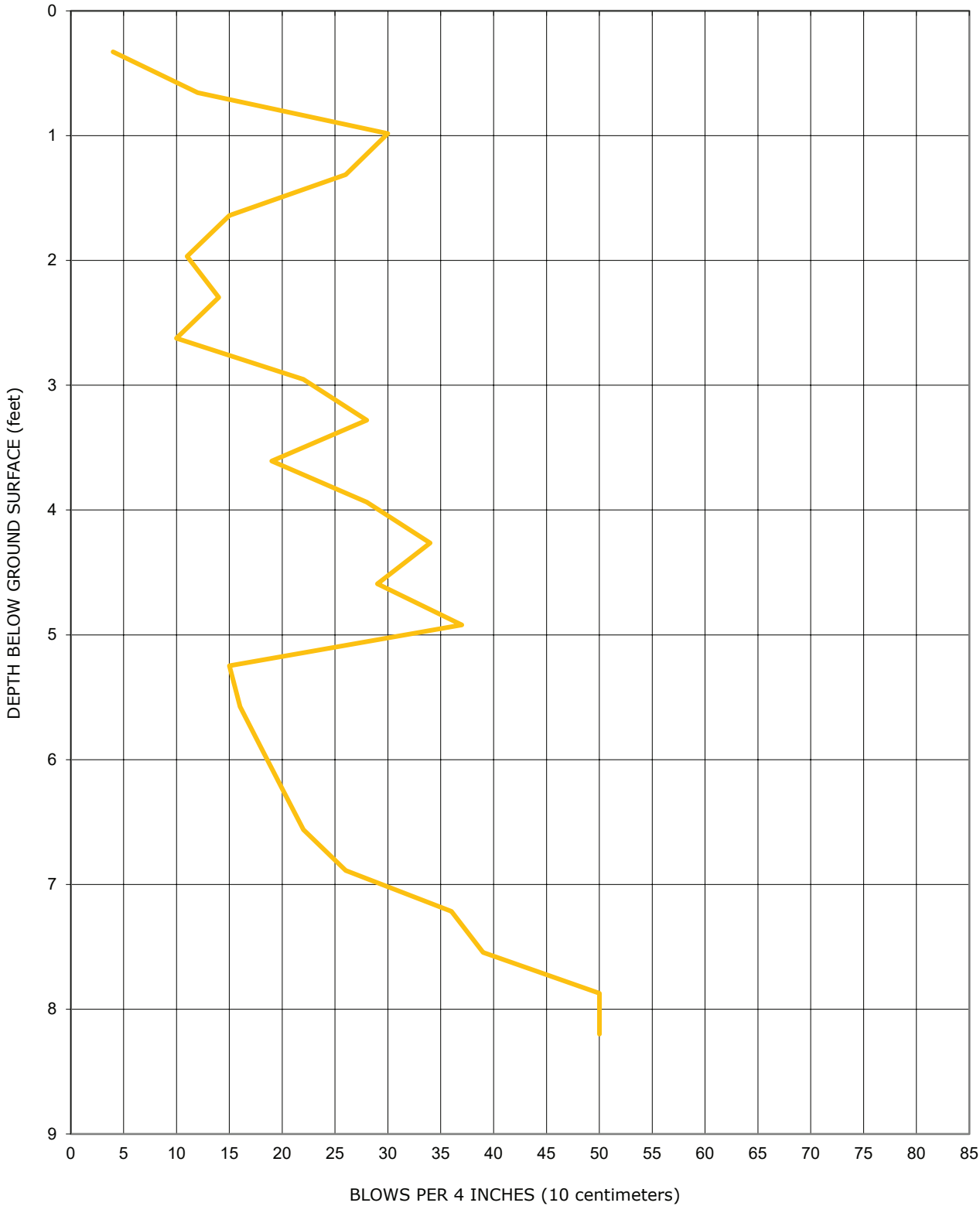


300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

DYNAMIC PENETROMETER TEST RESULTS
DPT-3

Date 07/24/23	Project No. 22-2164	Figure A-15

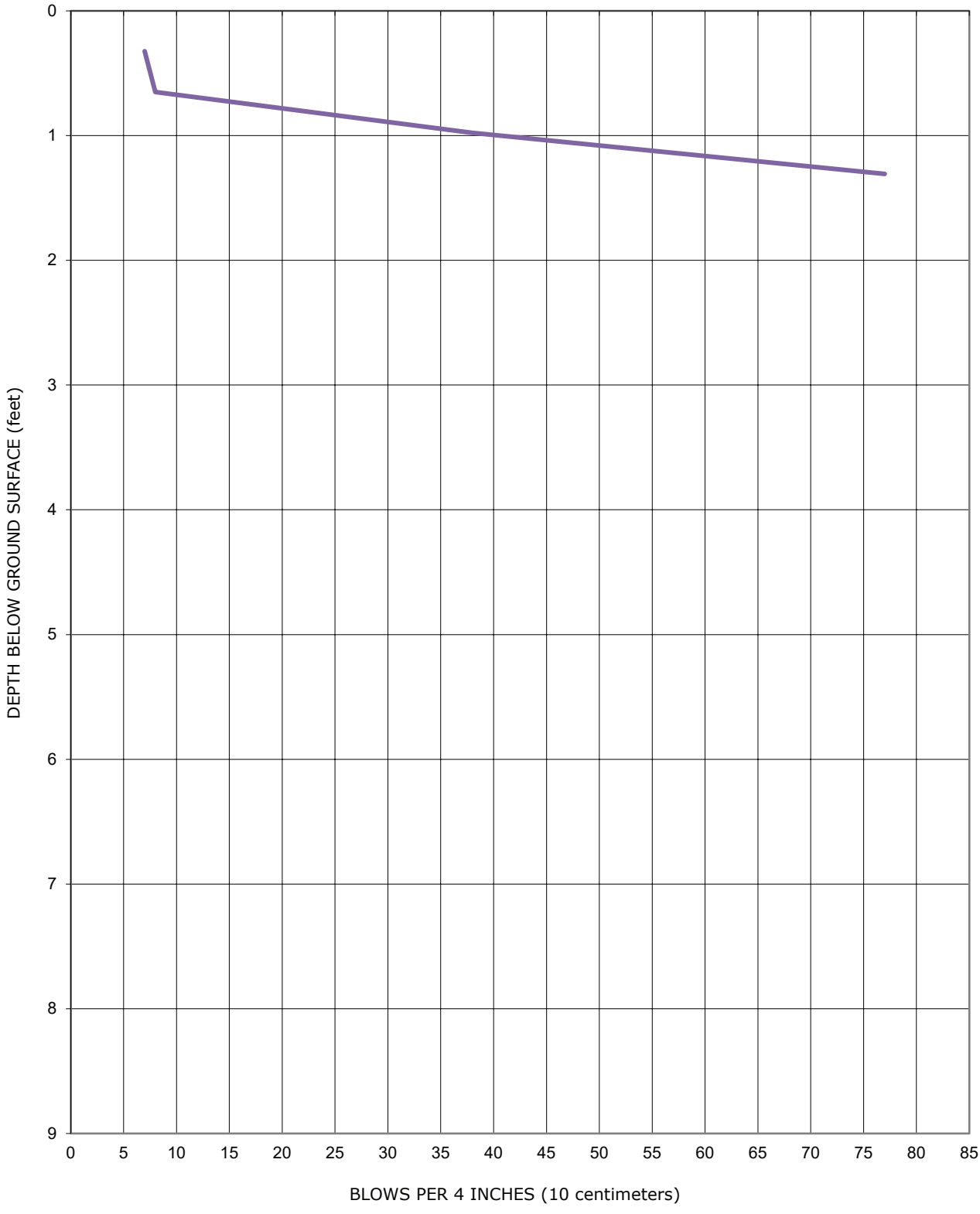


300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

DYNAMIC CONE PENETROMETER TEST RESULTS
DPT-4

Date 07/24/23	Project No. 22-2164	Figure A-16

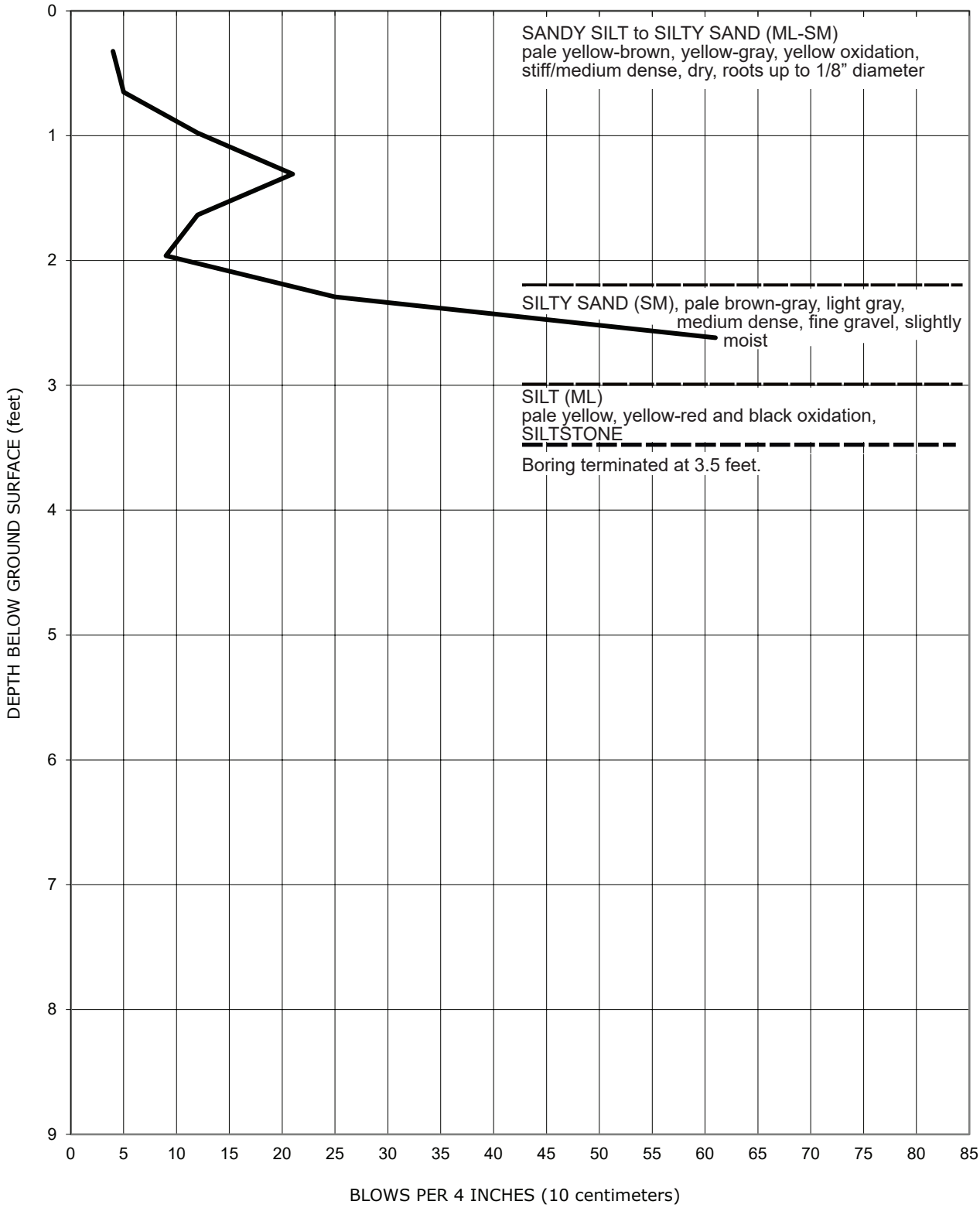


300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

DYNAMIC PENETROMETER TEST RESULTS
DPT-5

Date 07/24/23	Project No. 22-2164	Figure A-17

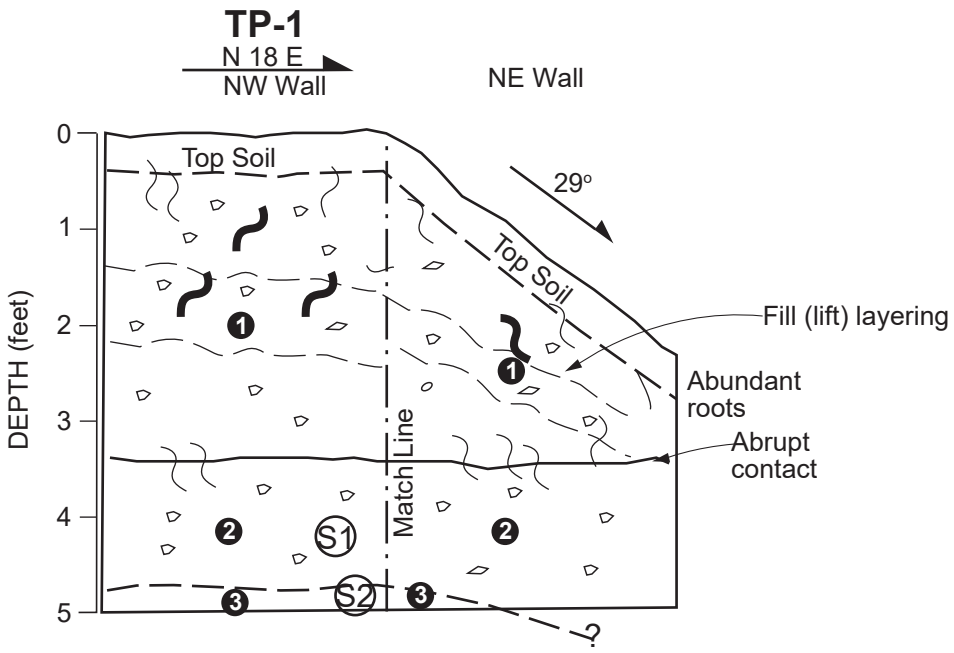


300 PIEDMONT AVENUE
San Bruno, California

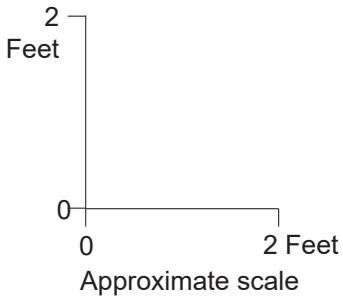
ROCKRIDGE GEOTECHNICAL

DYNAMIC PENETROMETER TEST AND BORING RESULTS DPT-6/ HA-1

Date 08/02/23	Project No. 22-2164	Figure A-18



1-1/2 inch metal pipe crosses the east side of the test pit 1-foot below the ground surface.



UNIT DESCRIPTIONS

❶ SILTY SAND to SANDY SILT with GRAVEL (SM-ML), yellowish gray and pale yellow (layered), stiff/medium dense, dry, abundant fine to coarse gravel, shell and coquina fragments, abundant roots to 2 inches in diameter (Fill)

❷ SANDY CLAY with GRAVEL (CL), olive yellow, grayish brown, with reddish yellow mottling, moist, very stiff, moist, fine to coarse gravel, abundant roots, Sample S1 (Colluvium?)

❸ SAND (SW), reddish brown, reddish yellow and gray mottled, dense, moist, fine to coarse sand to pebbles, shell and coquina fragments, Fe cement, dark grayish brown clay (cross-beds) Sample S2 (Merced Formation)

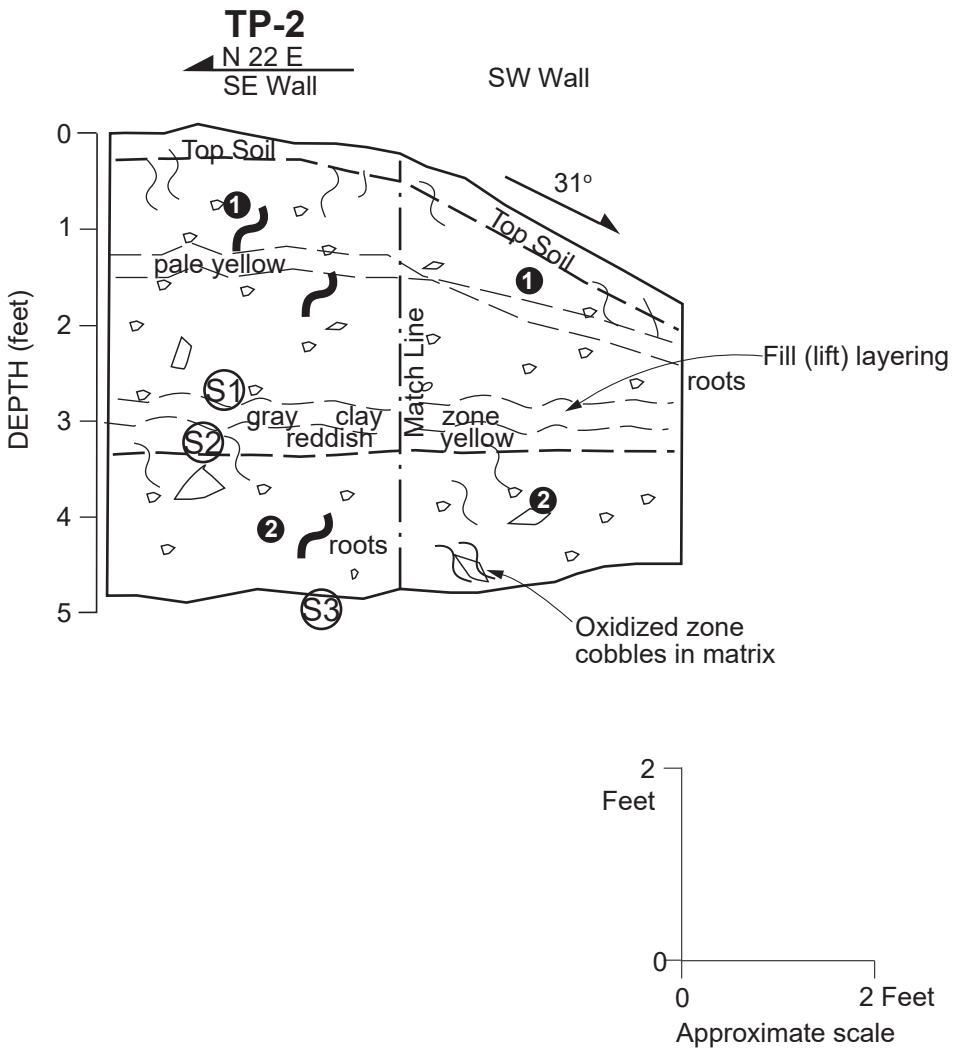
Notes:
1. See figure 2 for test pit locations.
2. Ground surface profiles constructed using hand level and tape.
3. Horizontal = Vertical Scale.
4. Hand excavated by pick and shovel

300 PIEDMONT AVENUE
San Bruno, California

LOG OF TEST PIT 1

ROCKRIDGE GEOTECHNICAL

Date 07/31/23	Project No. 22- 2164	Figure A-19



UNIT DESCRIPTIONS

❶ SILTY SAND to SANDY SILT with GRAVEL (SM-ML), light brownish gray, yellowish gray and olive yellow, reddish yellow (layered), stiff, loose to medium dense, dry, abundant fine to coarse gravel, abundant roots to 1/4 " diameter, Sample S1, Sample S2 (Fill)

❷ SILTY SAND to SANDY SILT with GRAVEL (SM-ML), light grayish brown, yellow and olive-yellow, medium dense/hard, dry, abundant resistant rounded fine to coarse gravel, occasional roots to 1/4" diameter, Sample S3 (Fill or Residual Soil?)

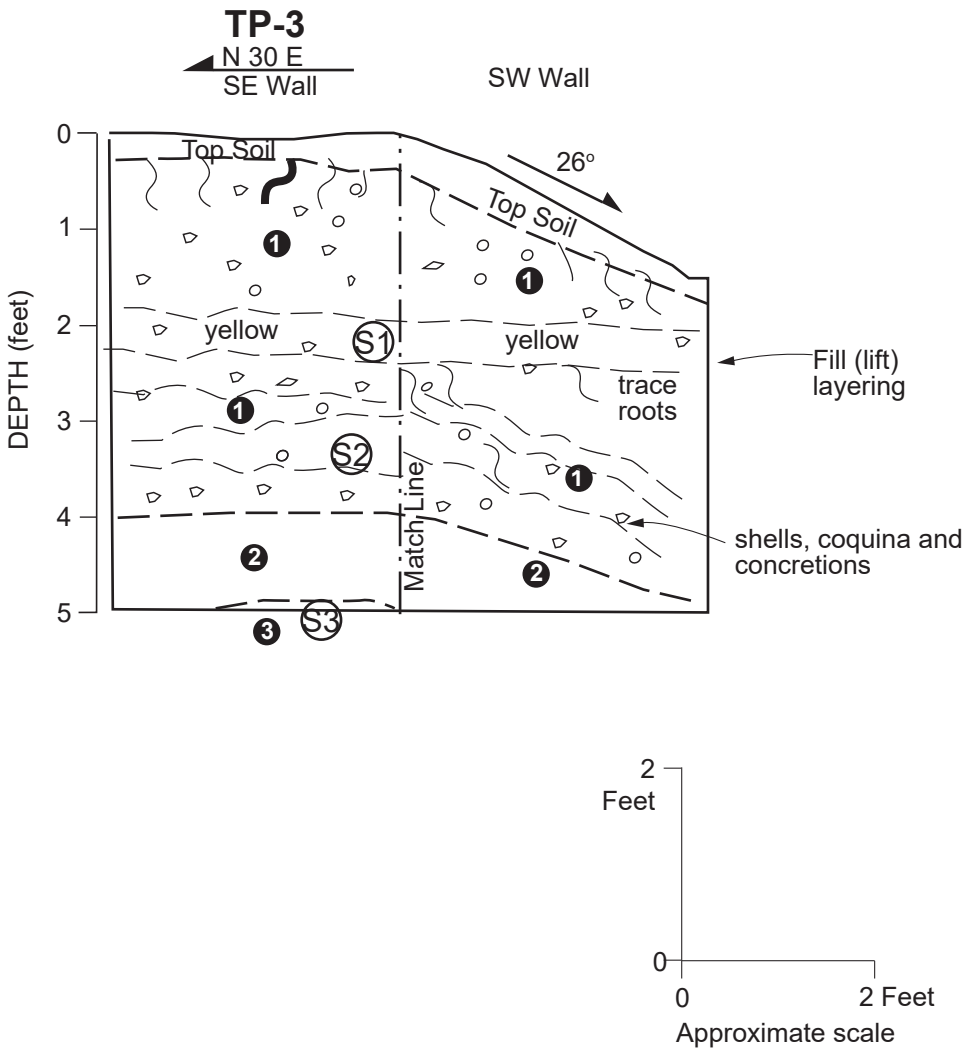
Notes:
1. See figure 2 for test pit locations.
2. Ground surface profiles constructed using hand level and tape.
3. Horizontal = Vertical Scale.
4. Hand excavated by pick and shovel

300 PIEDMONT AVENUE
San Bruno, California

LOG OF TEST PIT 2

ROCKRIDGE GEOTECHNICAL

Date 07/28/23	Project No. 22- 2164	Figure A-20



UNIT DESCRIPTIONS

❶ SILTY SAND to SANDY SILT with GRAVEL (SM-ML), light brownish gray, yellowish gray to olive yellow and reddish yellow (layered), stiff/loose to medium dense, dry, abundant fine to coarse gravel, abundant roots to 3/4 " diameter, Sample S1 (Fill)

❷ SILTY SAND to SANDY SILT with GRAVEL (SM-ML), light grayish brown, yellow and olive-yellow, medium dense/hard, dry, abundant resistant sub-rounded fine to coarse gravel, shell fragments, concretions, etc., Sample S2 (Fill or Residual Soil?)

❸ SILTY SANDSTONE, light grayish brown, reddish brown oxidation, fine sand, low hardness friable, poorly consolidated, deeply weathered, abundant shell fragments, Sample S3 (Merced Formation)

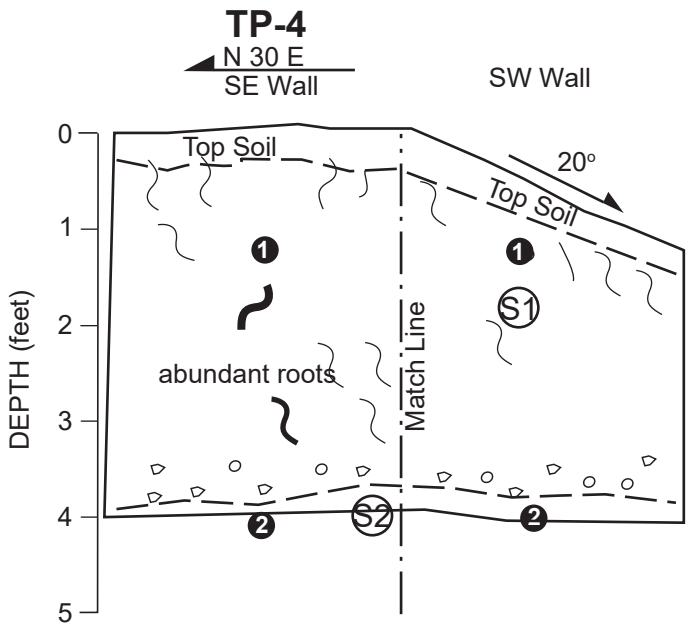
Notes:
1. See figure 2 for test pit locations.
2. Ground surface profiles constructed using hand level and tape.
3. Horizontal = Vertical Scale.
4. Hand excavated by pick and shovel

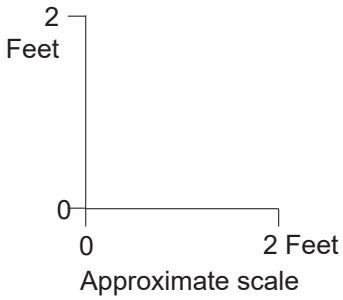
300 PIEDMONT AVENUE
San Bruno, California

LOG OF TEST PIT 3

ROCKRIDGE GEOTECHNICAL

Date 07/28/23	Project No. 22- 2164	Figure A-21





UNIT DESCRIPTIONS

❶ SILTY SAND to SANDY SILT (SM-ML), light grayish brown, pale olive yellow, medium dense, very stiff, dry, abundant fine to coarse gravel only at the base of the unit at 3.5 feet, roots to 2 inches in diameter, leafy debris to 3.7 feet Sample S1 (Fill)

❷ CLAYEY SAND (SC), light olive gray, reddish yellow oxidized, dense, moist, fine grained sand, Sample S2 (Fill or Residual Soil?)

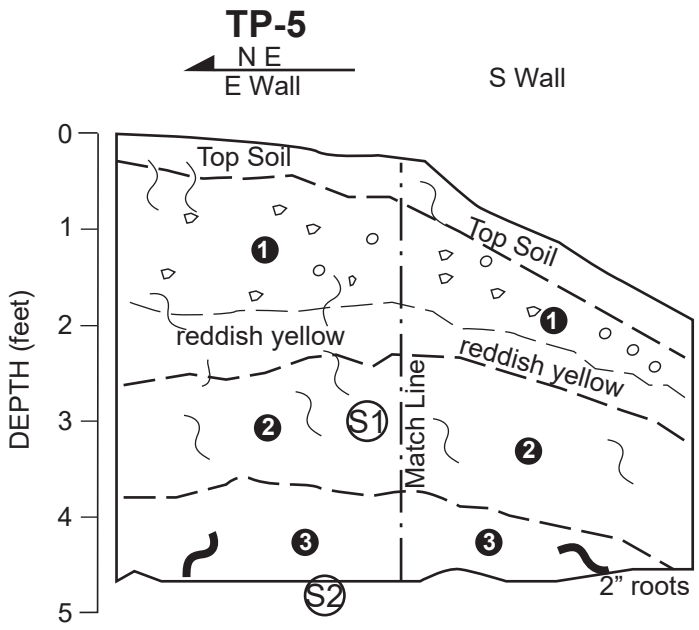
Notes:
1. See figure 2 for test pit locations.
2. Ground surface profiles constructed using hand level and tape.
3. Horizontal = Vertical Scale.
4. Hand excavated by pick and shovel

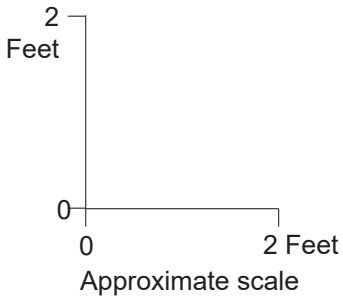
300 PIEDMONT AVENUE
San Bruno, California

LOG OF TEST PIT 4

ROCKRIDGE GEOTECHNICAL

Date 07/28/23	Project No. 22- 2164	Figure A-22





UNIT DESCRIPTIONS

❶ SILTY SAND with GRAVEL (SM), light grayish brown, reddish yellow (layered), medium dense, fine sub-rounded to sub-angular gravel (Fill)

❷ SILTY SAND (SM), brown, medium dense, moist, fine grained sand, organic rich, soil development, Sample S1 (Colluvium/buried soil)

❸ CLAYEY SAND to SANDY CLAY (SC-CL), light brownish gray, reddish yellow oxidized, medium dense/very stiff, moist, fine grained sand, occasional fine roots, roots to 2 inches in diameter at 4.5 feet, Sample S2 (Colluvium/Residual soil?)

Notes:
1. See figure 2 for test pit locations.
2. Ground surface profiles constructed using hand level and tape.
3. Horizontal = Vertical Scale.
4. Hand excavated by pick and shovel

300 PIEDMONT AVENUE
San Bruno, California

LOG OF TEST PIT 5

ROCKRIDGE GEOTECHNICAL

Date 07/28/23	Project No. 22- 2164	Figure A-23

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		Symbols	Typical Names
Coarse-Grained Soils (more than half of soil > no. 200 sieve size)	Gravels (More than half of coarse fraction > no. 4 sieve size)	GW	Well-graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	Sands (More than half of coarse fraction < no. 4 sieve size)	SW	Well-graded sands or gravelly sands, little or no fines
		SP	Poorly-graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
Fine -Grained Soils (more than half of soil < no. 200 sieve size)	Silts and Clays LL = < 50	ML	Inorganic silts and clayey silts of low plasticity, sandy silts, gravelly silts
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL	Organic silts and organic silt-clays of low plasticity
	Silts and Clays LL = > 50	MH	Inorganic silts of high plasticity
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic silts and clays of high plasticity
Highly Organic Soils		PT	Peat and other highly organic soils

GRAIN SIZE CHART

Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	Grain Size in Millimeters
Boulders	Above 12"	Above 305
Cobbles	12" to 3"	305 to 76.2
Gravel coarse fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
Sand coarse medium fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.075 4.76 to 2.00 2.00 to 0.420 0.420 to 0.075
Silt and Clay	Below No. 200	Below 0.075

Unstabilized groundwater level

Stabilized groundwater level

SAMPLE DESIGNATIONS/SYMBOLS

Sample taken with California or Modified California split-barrel sampler. Darkened area indicates soil recovered

Classification sample taken with Standard Penetration Test sampler

Undisturbed sample taken with thin-walled tube

Disturbed sample

Sampling attempted with no recovery

Core sample

Analytical laboratory sample

Sample taken with Direct Push sampler

Sonic

SAMPLER TYPE

C Core barrel

CA California split-barrel sampler with 2.5-inch outside diameter and a 1.93-inch inside diameter

D&M Dames & Moore piston sampler using 2.5-inch outside diameter, thin-walled tube

O Osterberg piston sampler using 3.0-inch outside diameter, thin-walled Shelby tube

PT Pitcher tube sampler using 3.0-inch outside diameter, thin-walled Shelby tube

MC Modified California sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter

SPT Standard Penetration Test (SPT) split-barrel sampler with a 2.0-inch outside diameter and a 1.38- or 1.5-inch inside diameter (refer to text)

ST Shelby Tube (3.0-inch outside diameter, thin-walled tube) advanced with hydraulic pressure

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

CLASSIFICATION CHART

Date 07/31/23 | Project No. 22-2164 | Figure A-24

I FRACTURING

Intensity	Size of Pieces in Feet
Very little fractured	Greater than 4.0
Occasionally fractured	1.0 to 4.0
Moderately fractured	0.5 to 1.0
Closely fractured	0.1 to 0.5
Intensely fractured	0.05 to 0.1
Crushed	Less than 0.05

II HARDNESS

1. **Soft** - reserved for plastic material alone.
2. **Low hardness** - can be gouged deeply or carved easily with a knife blade.
3. **Moderately hard** - can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and is readily visible after the powder has been blown away.
4. **Hard** - can be scratched with difficulty; scratch produced a little powder and is often faintly visible.
5. **Very hard** - cannot be scratched with knife blade; leaves a metallic streak.

III STRENGTH

1. **Plastic** or very low strength.
2. **Friable** - crumbles easily by rubbing with fingers.
3. **Weak** - an unfractured specimen of such material will crumble under light hammer blows.
4. **Moderately strong** - specimen will withstand a few heavy hammer blows before breaking.
5. **Strong** - specimen will withstand a few heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.
6. **Very strong** - specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.

IV WEATHERING - The physical and chemical disintegration and decomposition of rocks and minerals by natural processes such as oxidation, reduction, hydration, solution, carbonation, and freezing and thawing.

D. Deep - moderate to complete mineral decomposition; extensive disintegration; deep and thorough discoloration; many fractures, all extensively coated or filled with oxides, carbonates and/or clay or silt.

M. Moderate - slight change or partial decomposition of minerals; little disintegration; cementation little to unaffected. Moderate to occasionally intense discoloration. Moderately coated fractures.

L. Little - no megascopic decomposition of minerals; little of no effect on normal cementation. Slight and intermittent, or localized discoloration. Few stains on fracture surfaces.

F. Fresh - unaffected by weathering agents. No disintegration of discoloration. Fractures usually less numerous than joints.

ADDITIONAL COMMENTS:

V CONSOLIDATION OF SEDIMENTARY ROCKS: usually determined from unweathered samples. Largely dependent on cementation.

U = unconsolidated
P = poorly consolidated
M = moderately consolidated
W = well consolidated

VI BEDDING OF SEDIMENTARY ROCKS

Splitting Property	Thickness	Stratification
Massive	Greater than 4.0 ft.	very thick-bedded
Blocky	2.0 to 4.0 ft.	thick bedded
Slabby	0.2 to 2.0 ft.	thin bedded
Flaggy	0.05 to 0.2 ft.	very thin-bedded
Shaly or platy	0.01 to 0.05 ft.	laminated
Papery	less than 0.01	thinly laminated

300 PIEDMONT AVENUE
San Bruno, California

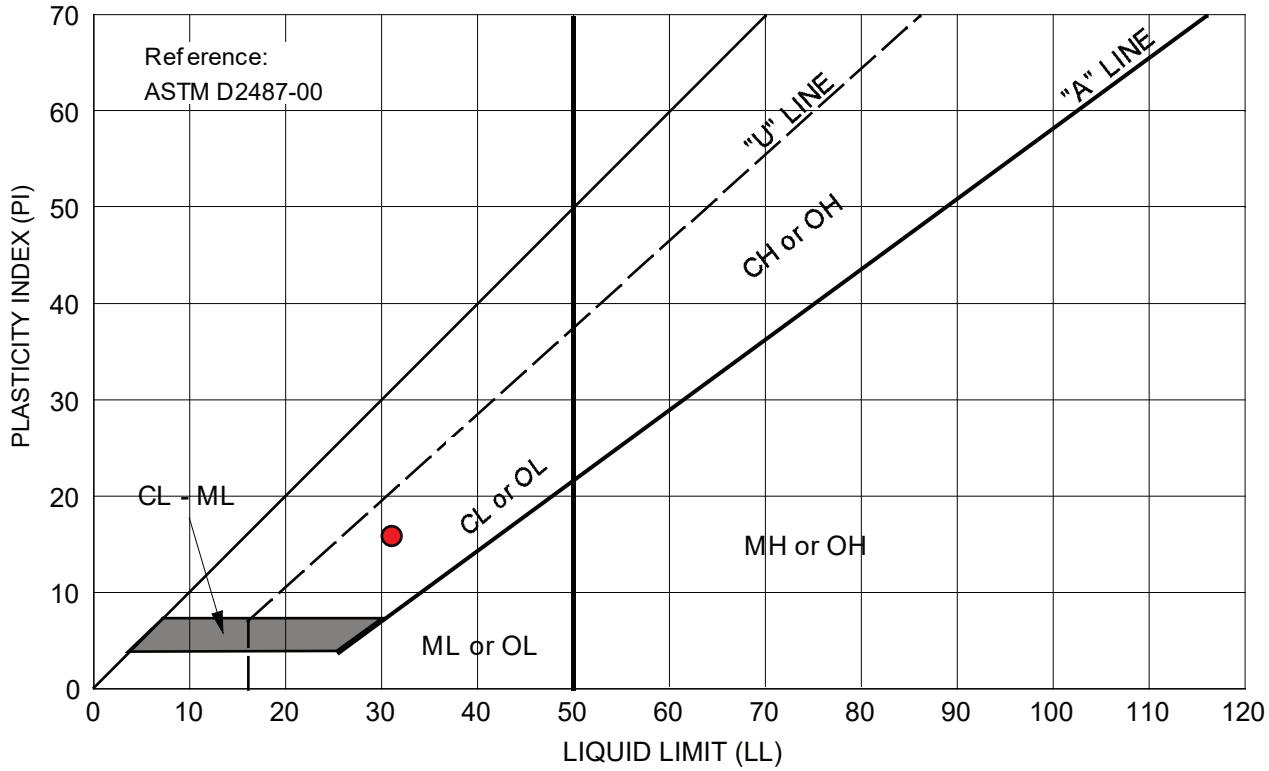
ROCKRIDGE GEOTECHNICAL

PHYSICAL PROPERTIES CRITERIA FOR ROCK DESCRIPTIONS

Date 07/31/23 | Project No. 22-2164 | Figure A-25

ROCKRIDGE GEOTECHNICAL

APPENDIX B
Laboratory Test Results



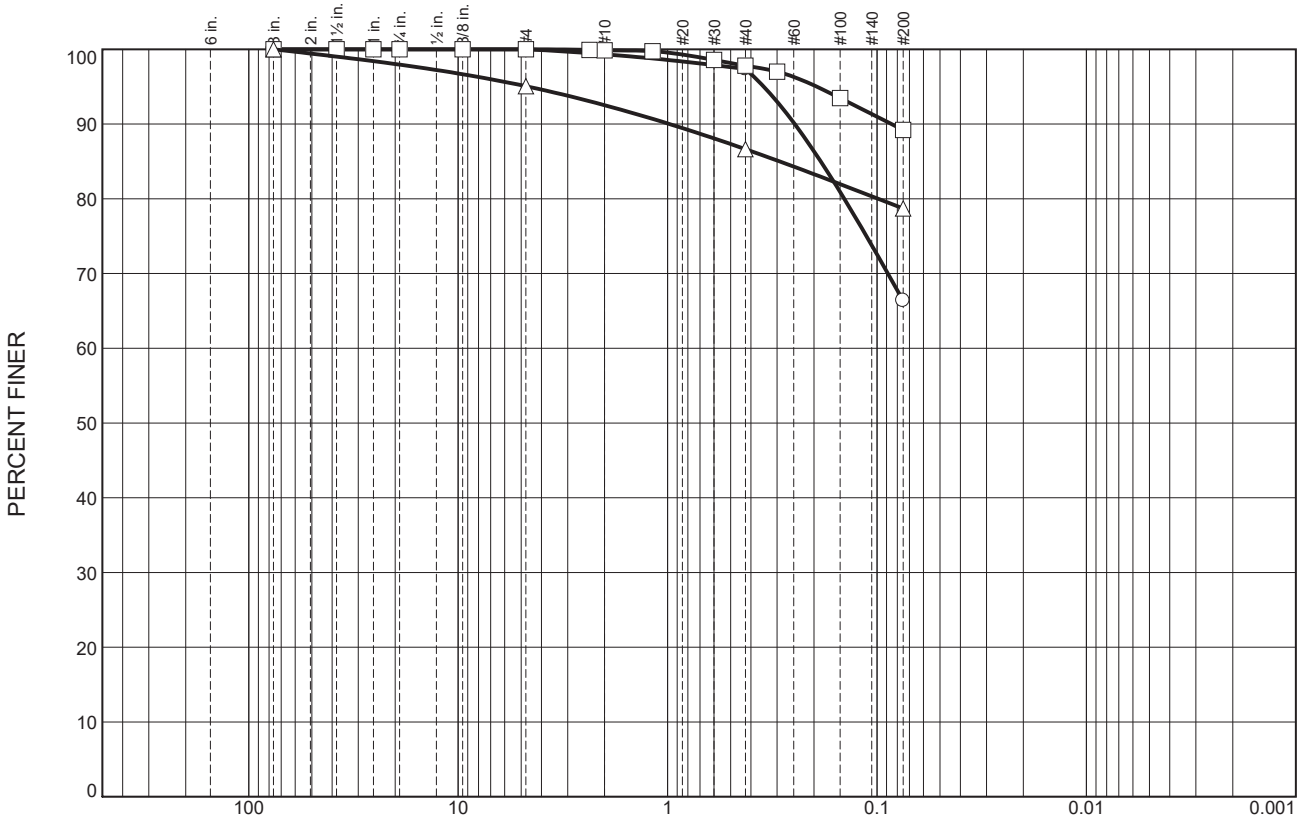
Symbol	Source	Description and Classification	Natural M.C. (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
●	RG-10 at 21.0 feet	SANDY CLAY (CL), red-yellow	22.1	31	16	--

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PLASTICITY CHART

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Date 07/25/23 | Project No. 22-2164 | Figure B-1



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.7	1.9	31.0	66.4	
□	0.0	0.0	0.0	0.1	2.1	8.6	89.2	
△	0.0	2.0	2.9	2.6	5.9	7.9	78.7	

SOIL DATA

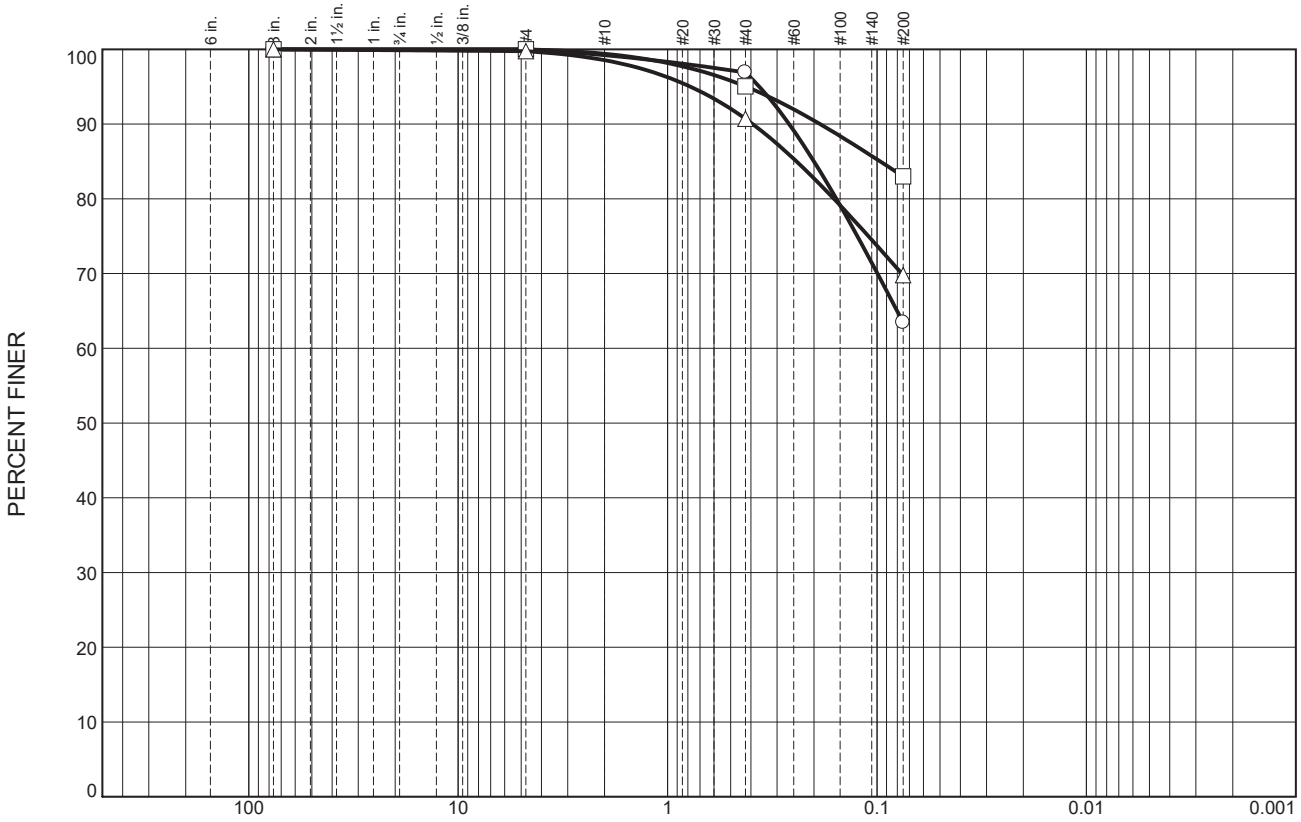
SYMBOL	SOURCE	DEPTH (ft.)	Material Description	USCS
○	RG-7	15.5'	SANDY SILT, yellow-brown	ML
□	RG-8	7.8'	SILT, gray	ML
△	RG-8	1.0'	SANDY SILT, yellow-brown	ML

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ROCKRIDGE GEOTECHNICAL

PARTICLE SIZE DISTRIBUTION REPORT

Date 07/25/23 | Project No. 22-2164 | Figure B-2



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.8	2.3	33.4	63.5	
□	0.0	0.0	0.0	0.6	4.4	12.0	83.0	
△	0.0	0.1	0.2	1.2	7.8	20.9	69.8	
							SM	

SOIL DATA

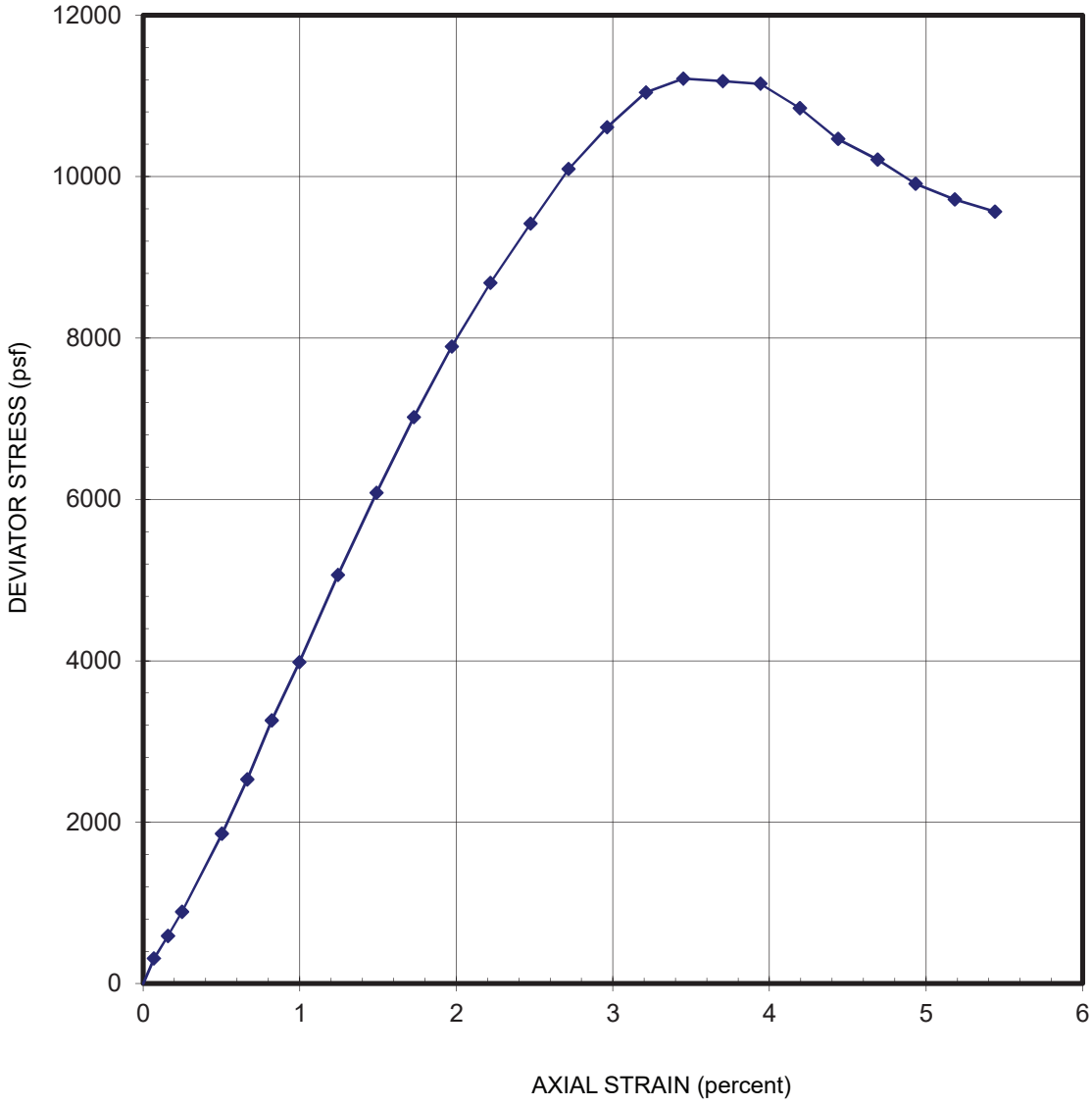
SYMBOL	SOURCE	DEPTH (ft.)	Material Description	USCS
○	RG-9	15.0'	SANDY SILT, gray	ML
□	RG-12	7.0 - 10.0'	SILT with SAND, gray	ML
△	RG-12	15.8'	SANDY SILT, gray	ML

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

PARTICLE SIZE DISTRIBUTION REPORT

Date 08/02/23 | Project No. 22-2164 | Figure B-3



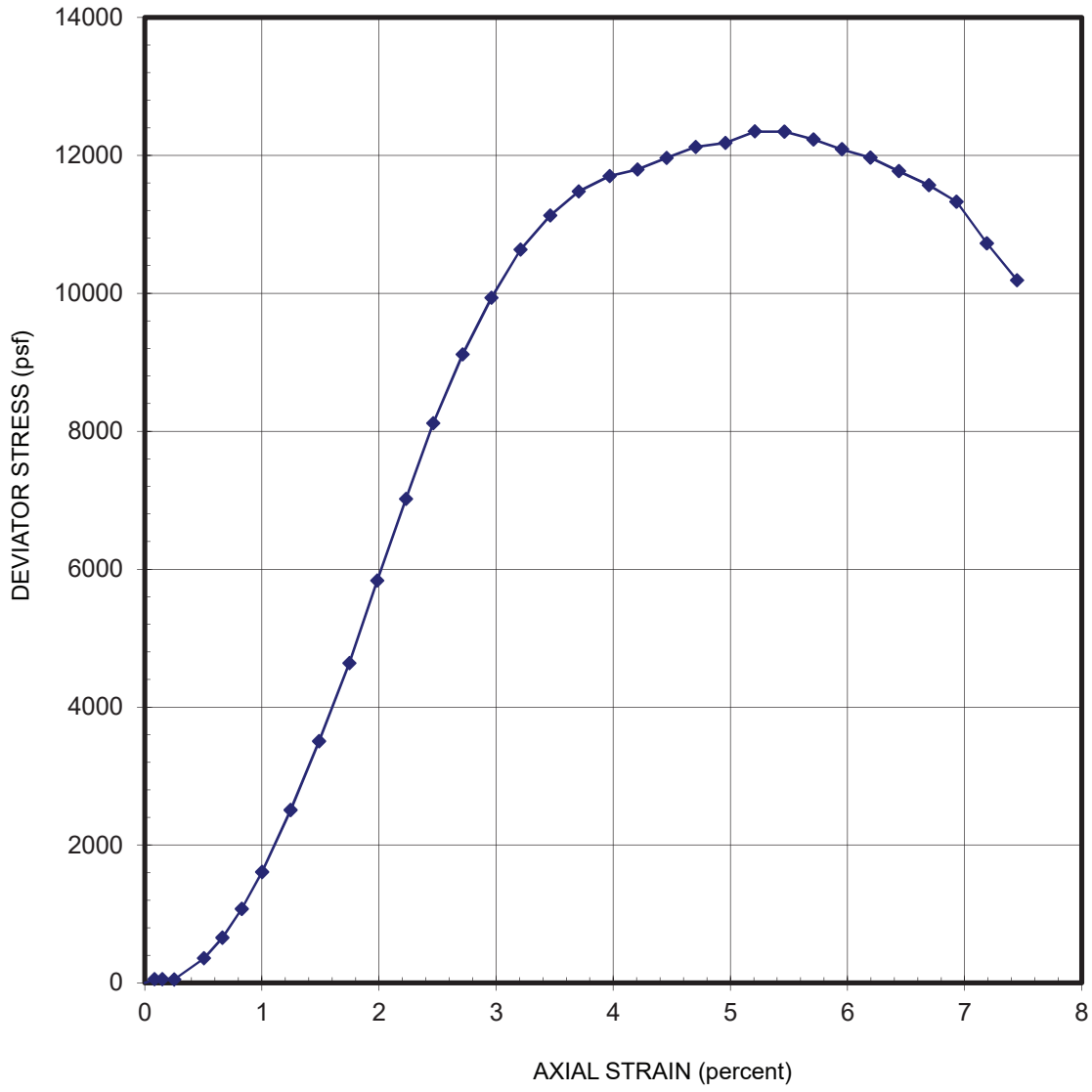
SAMPLER TYPE Modified California		SHEAR STRENGTH	5,600 psf
DIAMETER (in.) 2.39	HEIGHT (in.) 5.55	STRAIN AT FAILURE	3.5 %
MOISTURE CONTENT	16.9 %	CONFINING PRESSURE	2,000 psf
DRY DENSITY	114 pcf	STRAIN RATE	1 % / min.
DESCRIPTION SANDY SILT (ML), yellow-brown		SOURCE RG-7 at 15.5 feet	

300 PIEDMONT AVENUE
San Bruno, California

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

ROCKRIDGE GEOTECHNICAL

Date 08/02/23	Project No. 22-2164	Figure B-4



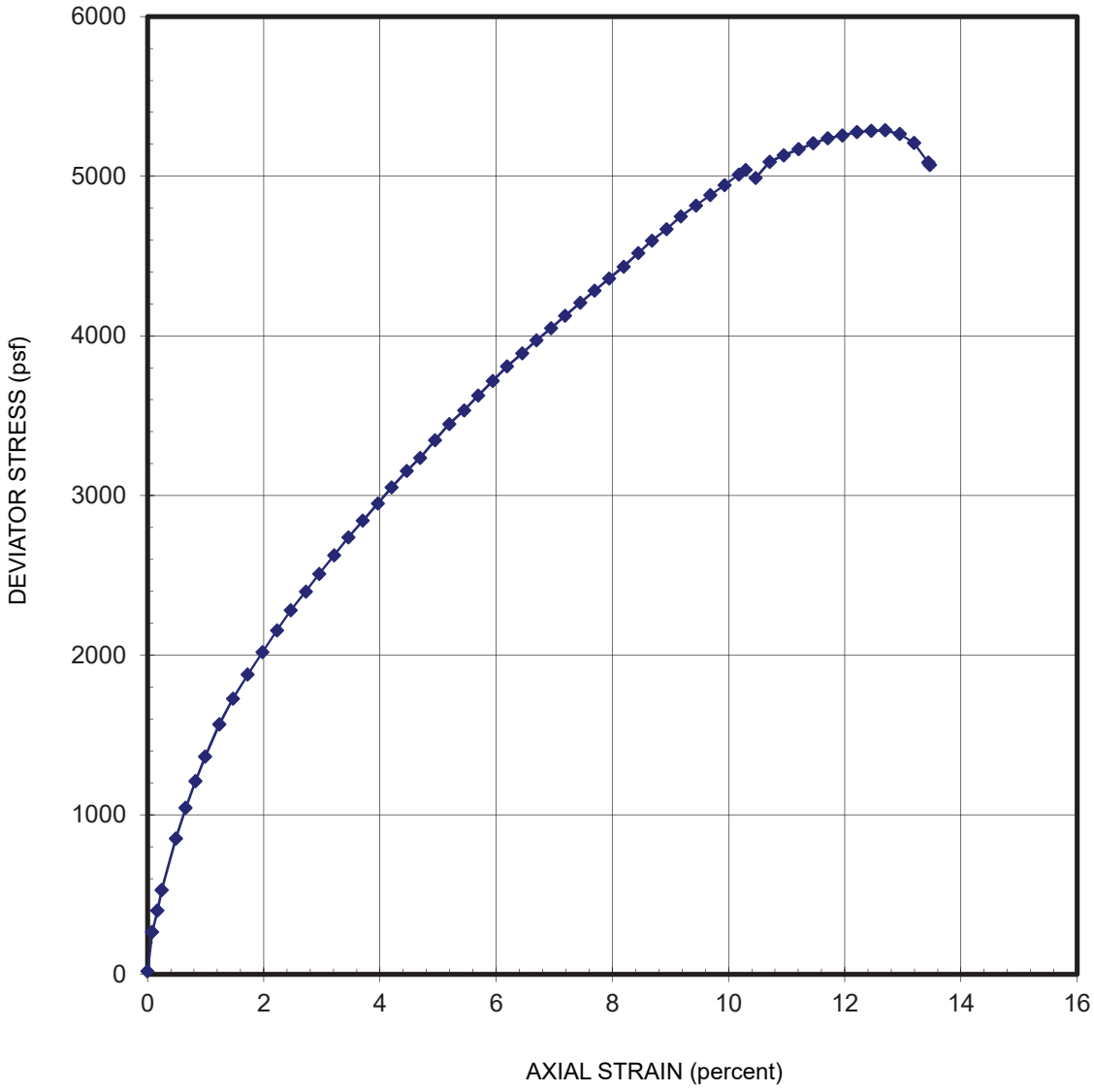
SAMPLER TYPE Modified California		SHEAR STRENGTH	6,170 psf
DIAMETER (in.) 2.39	HEIGHT (in.) 5.1	STRAIN AT FAILURE	5.2 %
MOISTURE CONTENT 13.2 %		CONFINING PRESSURE	1,950 psf
DRY DENSITY 117 pcf		STRAIN RATE	1 % / min.
DESCRIPTION SANDY SILT (ML), gray		SOURCE	RG-9 at 15.0 feet

300 PIEDMONT AVENUE
San Bruno, California

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

ROCKRIDGE GEOTECHNICAL

Date 08/02/23 | Project No. 22-2164 | Figure B-5



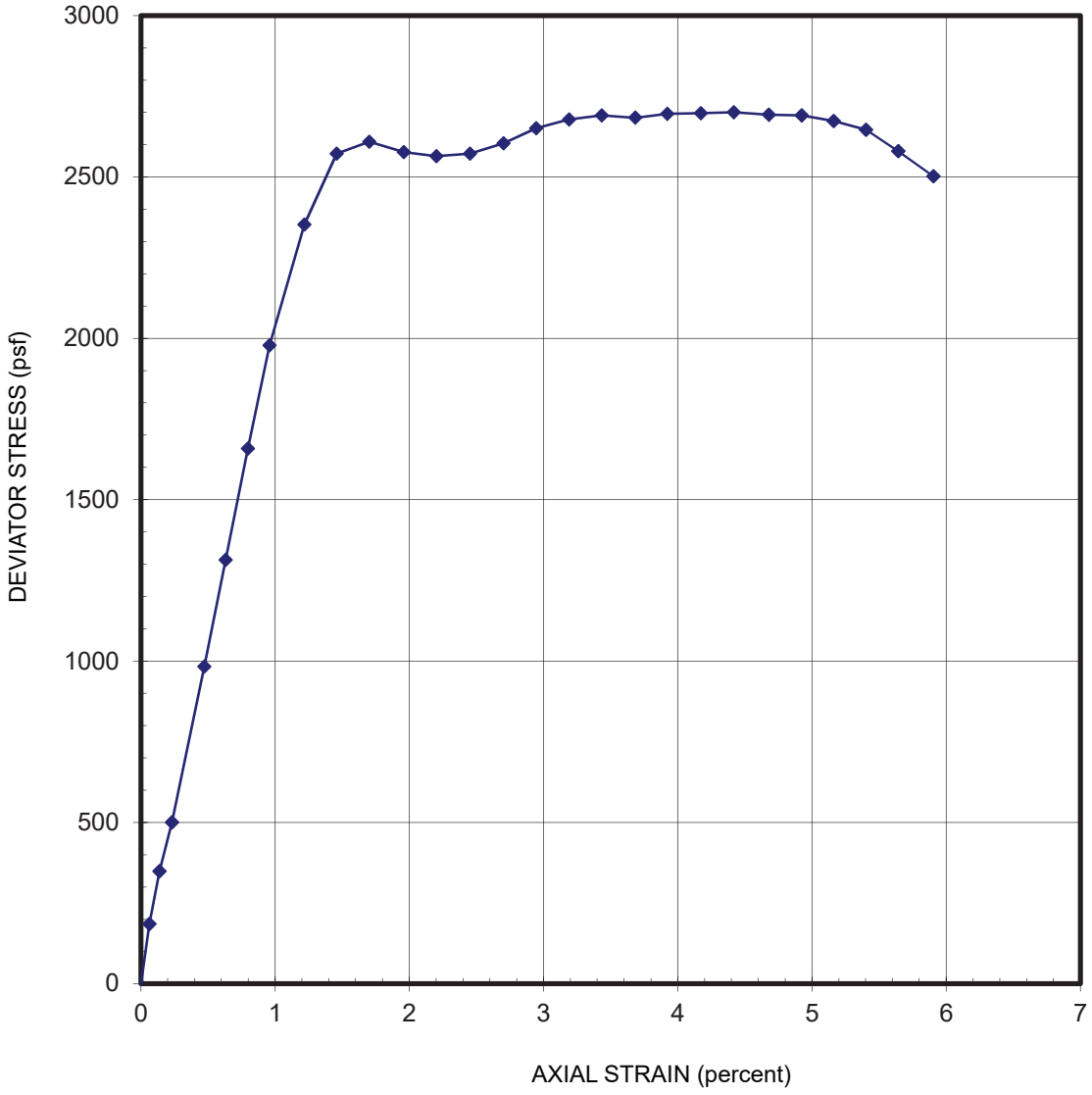
SAMPLER TYPE Modified California		SHEAR STRENGTH	2,640 psf
DIAMETER (in.) 2.39	HEIGHT (in.) 4.95	STRAIN AT FAILURE	12.7 %
MOISTURE CONTENT	22.1 %	CONFINING PRESSURE	2,750 psf
DRY DENSITY	104 pcf	STRAIN RATE	1 % / min.
DESCRIPTION SANDY CLAY (CL), red-yellow		SOURCE	RG-10 at 21.0 feet

300 PIEDMONT AVENUE
San Bruno, California

UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

ROCKRIDGE GEOTECHNICAL

Date 08/02/23 | Project No. 22-2164 | Figure B-6



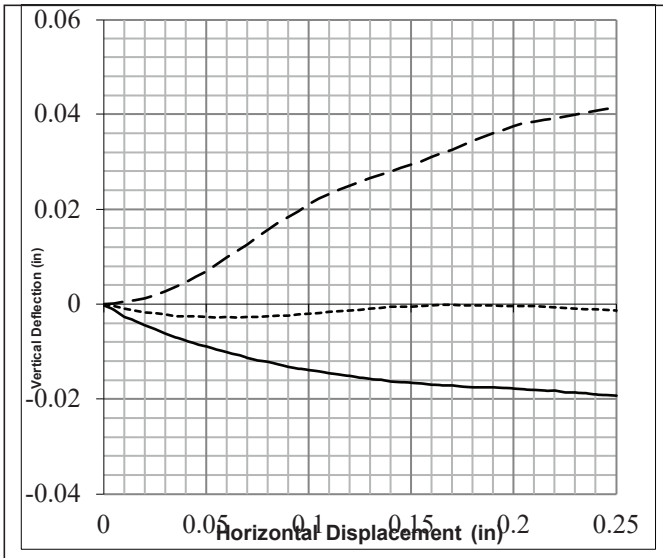
SAMPLER TYPE Modified California		SHEAR STRENGTH	1,350 psf
DIAMETER (in.) 2.39	HEIGHT (in.) 5.11	STRAIN AT FAILURE	4.4 %
MOISTURE CONTENT	12.5 %	CONFINING PRESSURE	2,000 psf
DRY DENSITY	117 pcf	STRAIN RATE	1 % / min.
DESCRIPTION SANDY SILT (ML), gray		SOURCE RG-12 at 15.8 feet	

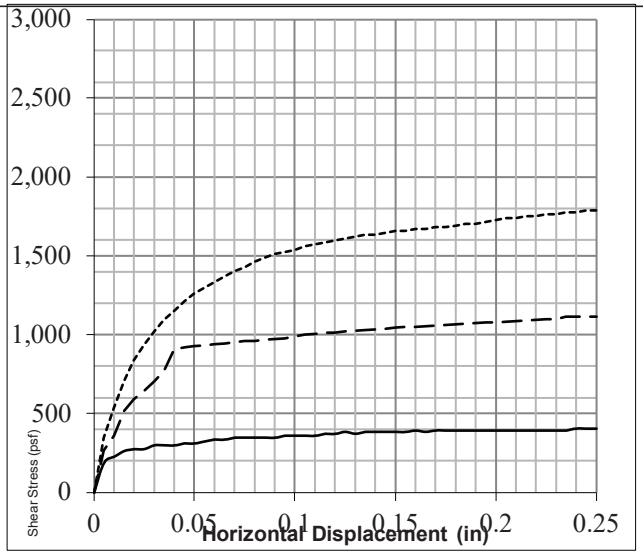
300 PIEDMONT AVENUE
San Bruno, California

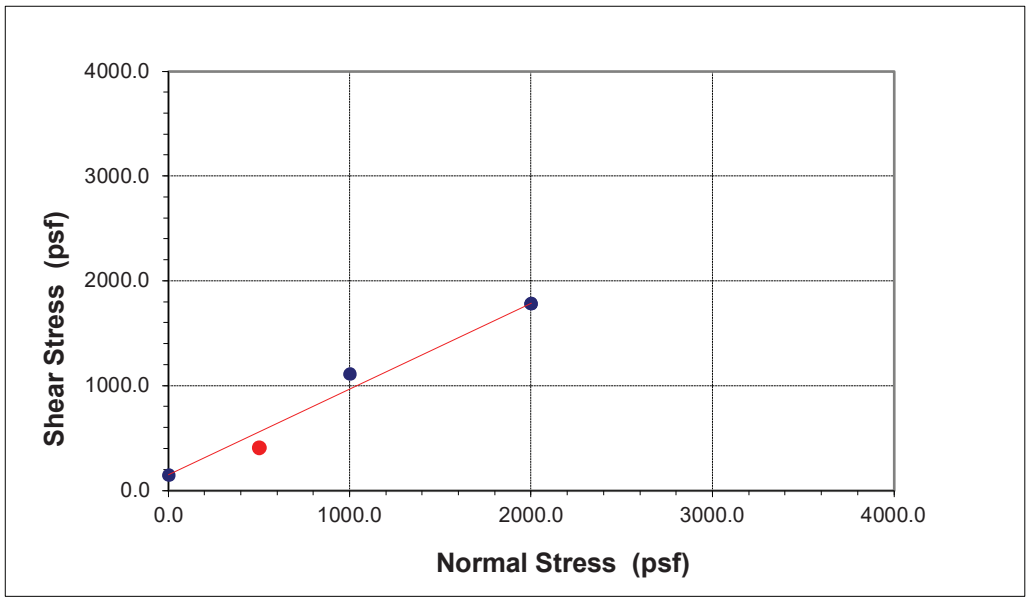
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

ROCKRIDGE GEOTECHNICAL

Date 08/02/23 | Project No. 22-2164 | Figure B-7







Legend

Test 1
Test 2
Test 3

Results

C = 150 psf
phi = 39 deg.

Gs = 2.70
Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	500	408	0.240	0.18	16.1	88.8	48	0.898	1.00	2.416	20.8	89.6	64	0.881	0.991
2	1000	1114	0.065	0.18	19.5	97.0	71	0.738	1.00	2.416	18.7	91.7	60	0.837	1.057
3	2000	1788	0.245	0.18	17.6	88.3	52	0.909	1.00	2.416	16.9	90.9	53	0.855	0.972

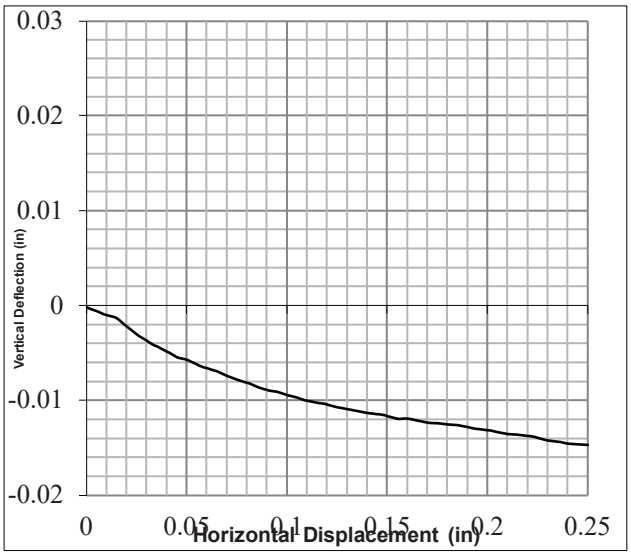
Client:	**Rockridge Geotechnical**	Boring #: **RG-7**	Sample #: **5**
Project:	**300 Piedmont Ave., San Bruno**	Depth (ft): **10**	
Project #:	**22-2164**	Soil:	**Undisturbed brown silty sand**

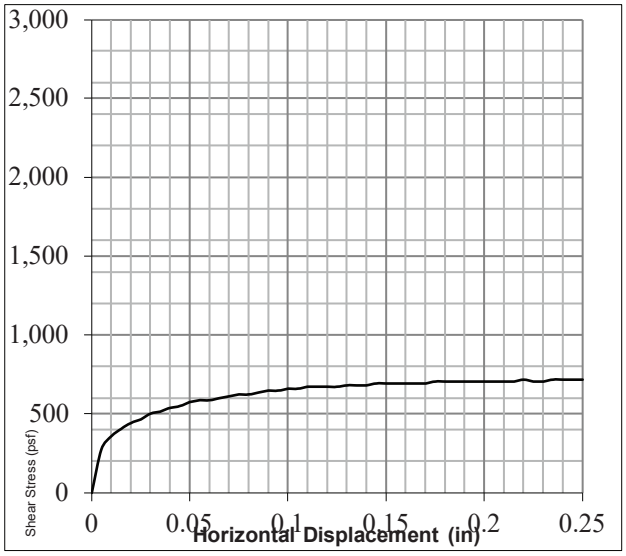
300 PIEDMONT AVENUE
San Bruno, California

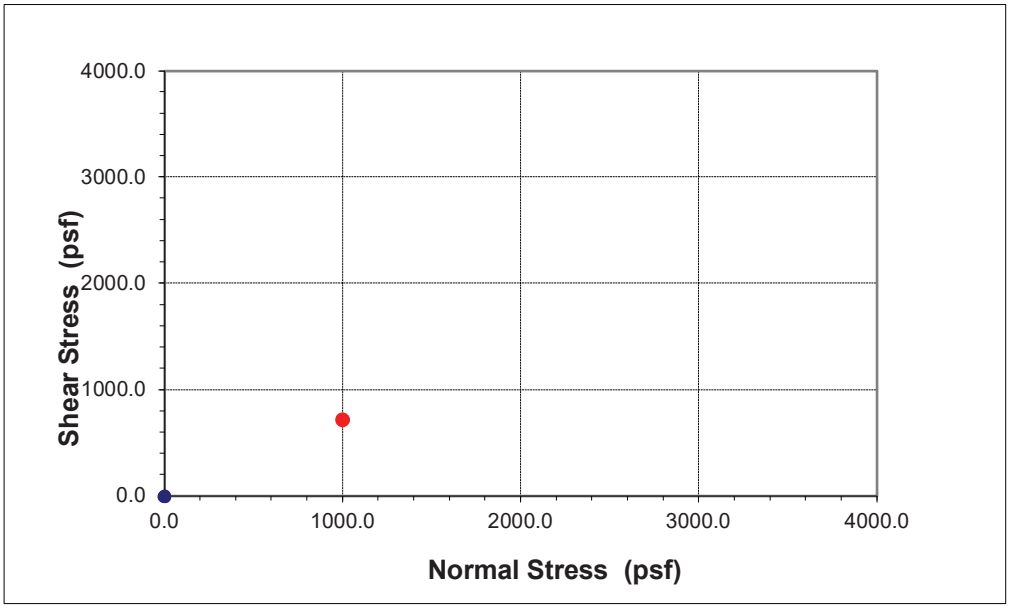
ROCKRIDGE GEOTECHNICAL

DIRECT SHEAR - INUNDATED, CONSOLIDATED, & DRAINED TEST

Date 07/26/23 | Project No. 22-2164 | Figure B-8







Legend

Test 1
Test 2
Test 3

Results

C = 0 psf
phi = ##### deg.

Gs = 2.70
Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	1000	720	0.220	0.18	18.2	86.6	52	0.946	1.00	2.416	29.3	86.9	84	0.940	0.997

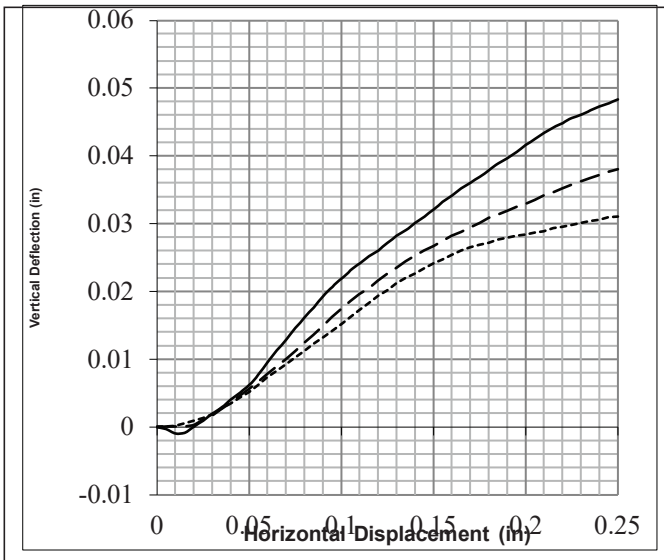
Client:	**Rockridge Geotechnical**	Boring #: **RG-7**	Sample #: **5**
Project:	**300 Piedmont Ave., San Bruno**	Depth (ft): **10**	
Project #:	**22-2164**	Soil:	**Undisturbed brown silty sand**

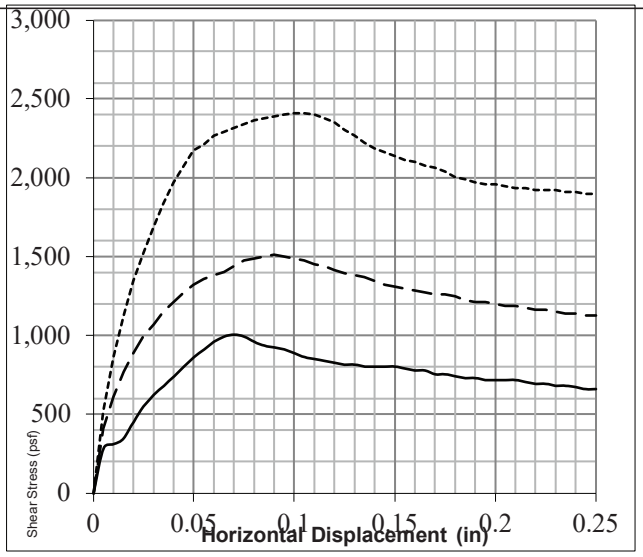
300 PIEDMONT AVENUE
San Bruno, California

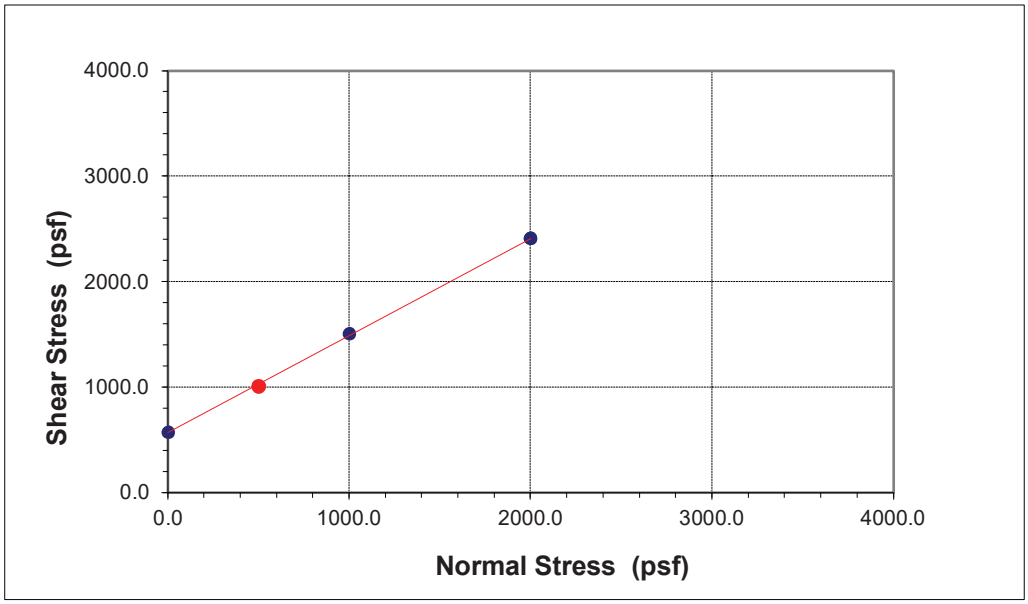
ROCKRIDGE GEOTECHNICAL

DIRECT SHEAR - INUNDATED, CONSOLIDATED, & DRAINED TEST

Date 07/26/23	Project No. 22-2164	Figure B-9







Legend

Test 1
Test 2
Test 3

Results

C = 575 psf
phi = 43 deg.

Gs = 2.70
Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	500	1008	0.070	0.09	15.0	112.7	82	0.496	1.00	2.416	14.2	108.4	69	0.555	1.040
2	1000	1512	0.090	0.09	16.2	110.7	84	0.523	1.00	2.416	15.1	105.3	68	0.601	1.051
3	2000	2412	0.100	0.09	19.1	106.9	89	0.576	1.00	2.416	17.8	100.6	71	0.675	1.063

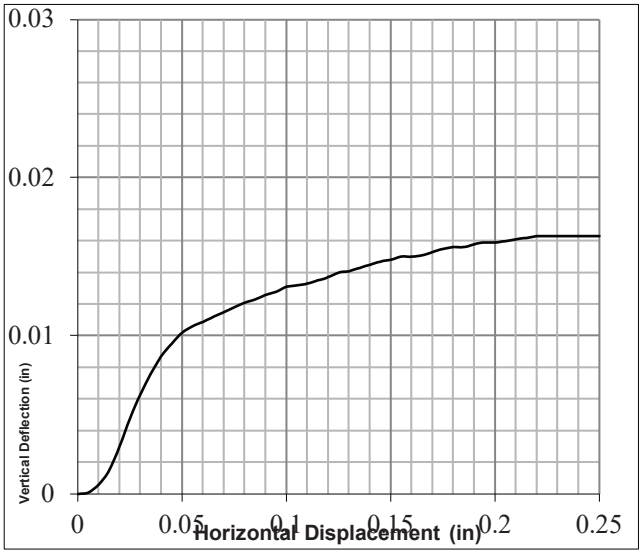
Client:	**Rockridge Geotechnical**	Boring #: **RG-9**	Sample #: **4b**
Project:	**300 Piedmont Ave., San Bruno**	Depth (ft): **7.8**	
Project #:	**22-2164**	Soil:	**Undisturbed gray sandy silt**

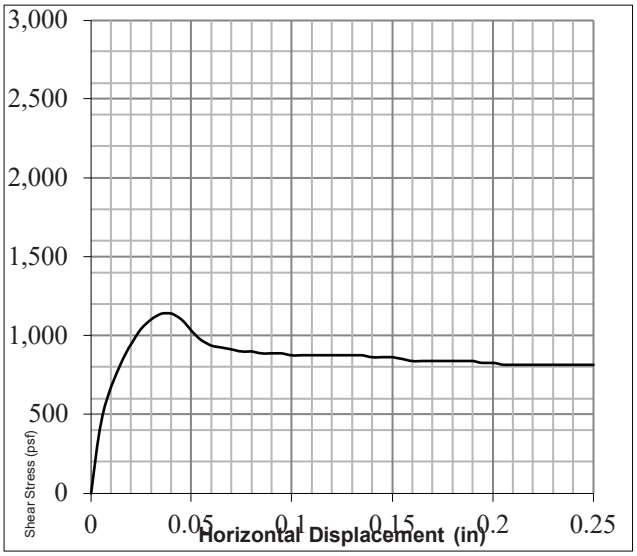
300 PIEDMONT AVENUE
San Bruno, California

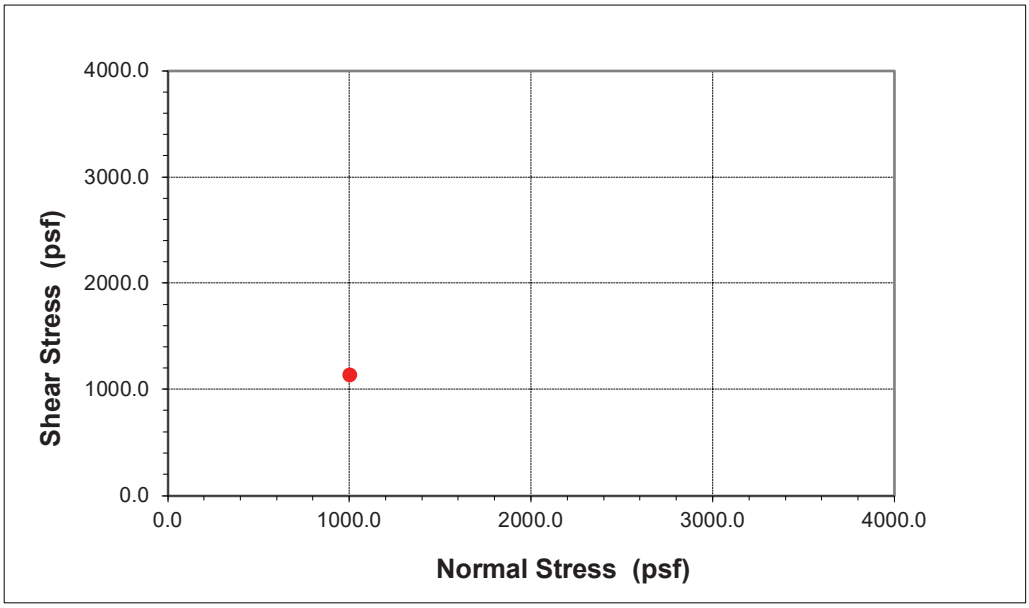
ROCKRIDGE GEOTECHNICAL

DIRECT SHEAR - INUNDATED, CONSOLIDATED, & DRAINED TEST

Date 07/26/23 | Project No. 22-2164 | Figure B-10







Legend

Test 1
Test 2
Test 3

Results

C = 0 psf
phi = ##### deg.

Gs = 2.70
Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	1000	1140	0.035	0.09	19.4	106.5	90	0.582	1.00	2.416	20.9	103.6	90	0.627	1.028

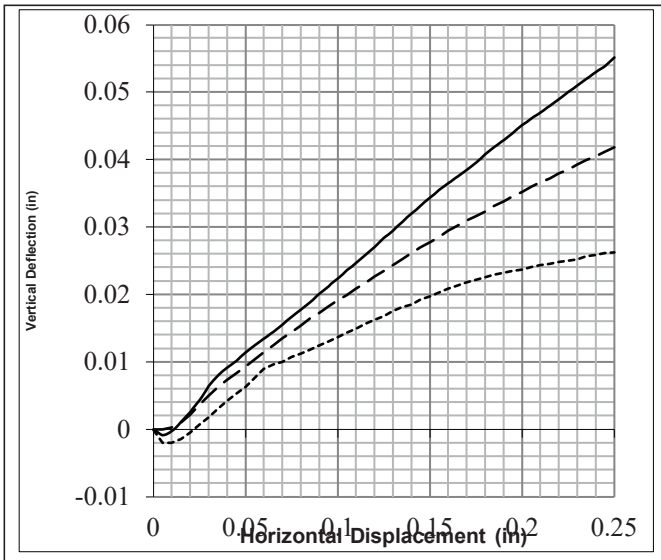
Client:	**Rockridge Geotechnical**	Boring #: **RG-9**	Sample #: **4b**
Project:	**300 Piedmont Ave., San Bruno**	Depth (ft): **7.8**	
Project #:	**22-2164**	Soil:	**Undisturbed gray sandy silt**

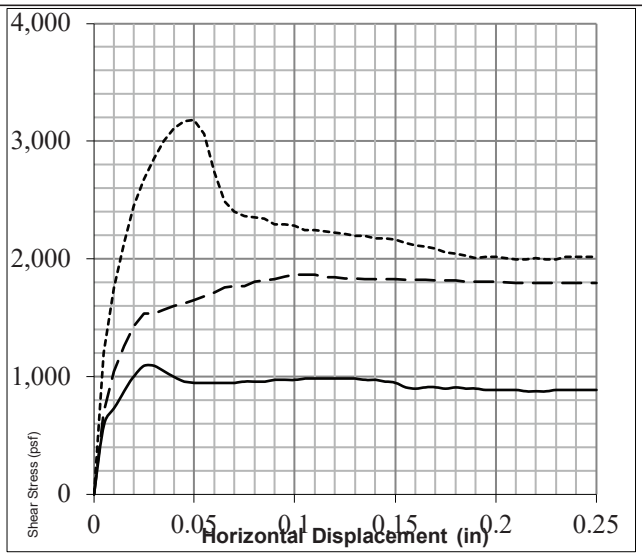
300 PIEDMONT AVENUE
San Bruno, California

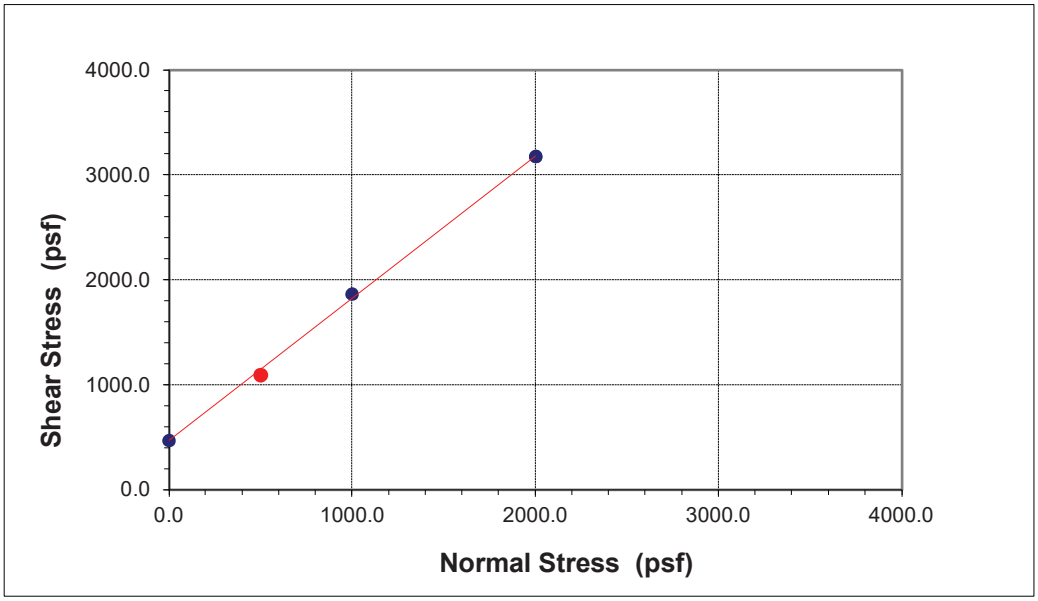
ROCKRIDGE GEOTECHNICAL

DIRECT SHEAR - INUNDATED, CONSOLIDATED, & DRAINED TEST

Date 07/26/23 | Project No. 22-2164 | Figure B-11







Legend

Test 1

Test 2

Test 3

Results

C = 475 psf

phi = 54 deg.

Gs = 2.70

Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	500	1092	0.025	0.09	12.2	105.8	56	0.593	1.00	2.416	11.9	100.0	47	0.686	1.058
2	1000	1866	0.025	0.09	12.2	108.9	60	0.548	1.00	2.416	11.6	103.8	50	0.624	1.049
3	2000	3180	0.050	0.09	12.9	111.3	68	0.514	1.00	2.416	12.5	107.6	59	0.567	1.035

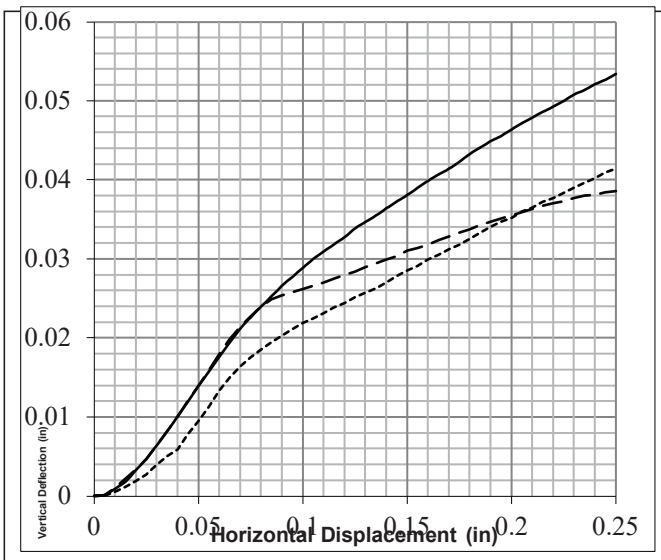
Client:	**Rockridge Geotechnical**	Boring #: **RG-9**	Sample #: **7**
Project:	**300 Piedmont Ave., San Bruno**	Depth (ft): **20**	
Project #:	**22-2164**	Soil:	**Undisturbed gray silty sand**

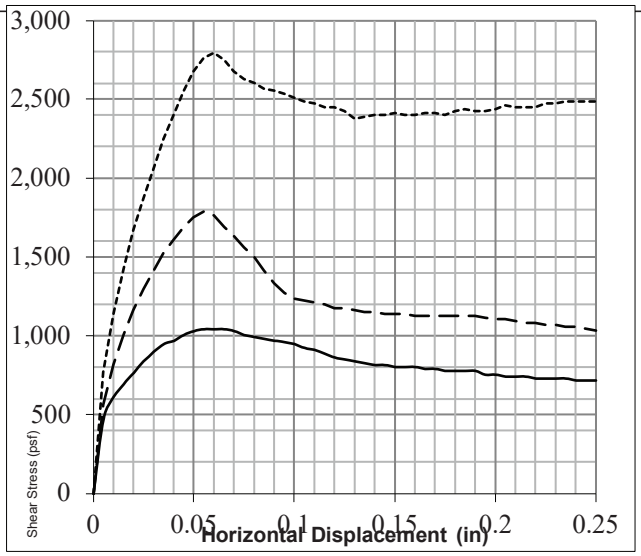
300 PIEDMONT AVENUE
San Bruno, California

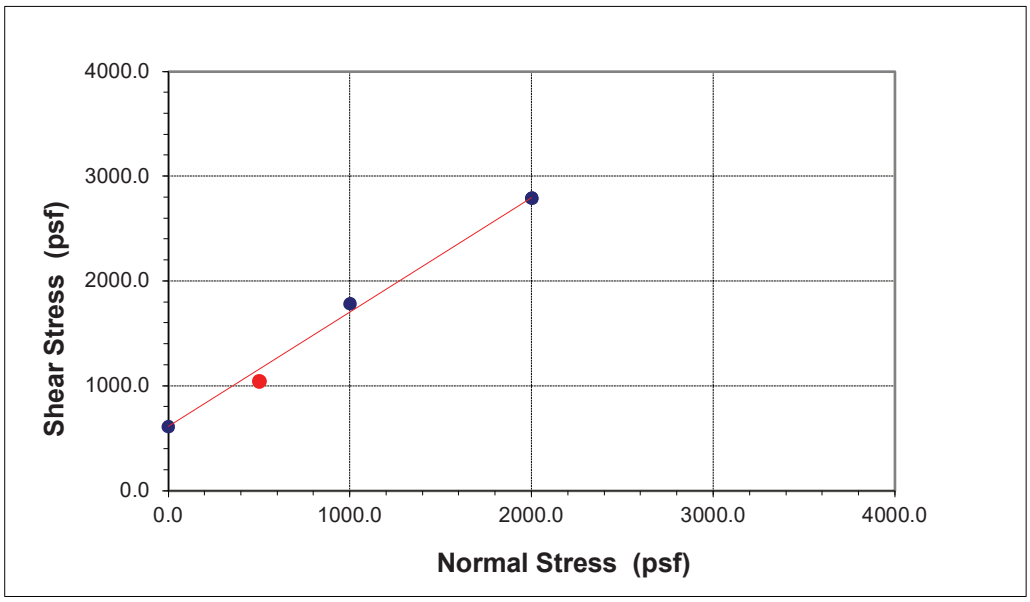
ROCKRIDGE GEOTECHNICAL

DIRECT SHEAR - INUNDATED, CONSOLIDATED, & DRAINED TEST

Date 07/26/23 | Project No. 22-2164 | Figure B-12







Legend

Test 1
Test 2
Test 3

Results

C = 615 psf
phi = 47 deg.

Gs = 2.70
Type = undisturbed

Test no.	SigN psf	Peak Shear str., psf	Displ. in.	Strain Rate in./hr	Initial MC %	Initial DD pcf	Initial Sat. %	Initial Void Ratio	Initial Ht. in.	Initial Dia. in.	Final MC %	Final DD pcf	Final Sat. %	Final Void Ratio	Final Ht. in.
1	500	1044	0.055	0.09	13.8	115.0	80	0.466	1.00	2.416	13.4	108.6	66	0.552	1.059
2	1000	1788	0.055	0.09	12.9	118.5	83	0.422	1.00	2.416	12.0	113.3	67	0.488	1.047
3	2000	2796	0.060	0.09	12.6	115.6	74	0.459	1.00	2.416	11.7	109.3	58	0.542	1.057

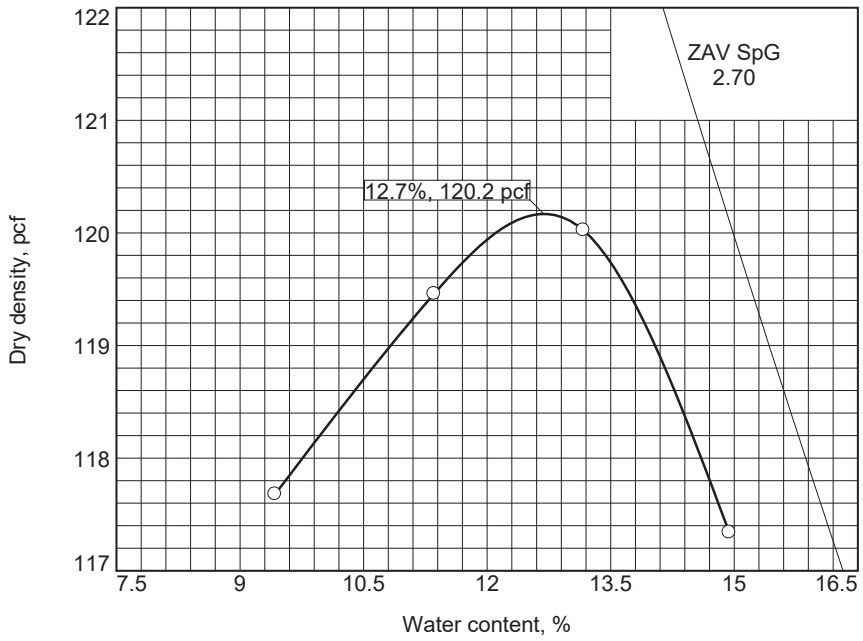
Client:	**Rockridge Geotechnical**	Boring #: **RG-10**	Sample #: **4b**
Project:	**300 Piedmont Ave., San Bruno**	Depth (ft): **15**	
Project #:	**22-2164**	Soil:	**Undisturbed gray silty sand**

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

DIRECT SHEAR - INUNDATED, CONSOLIDATED, & DRAINED TEST

Date 07/26/23	Project No. 22-2164	Figure B-13



Curve No.
1

Test Specification:
ASTM D 1557-12 Method A Modified

Hammer Wt.:	10 lb.
Hammer Drop:	18 in.
Number of Layers:	five
Blows per Layer:	25
Mold Size:	0.03333 cu. ft.

Test Performed on Material Passing #4 **Sieve**

Soil Data

NM		**Sp.G.**	
LL		**PI**	
%>#4		**%<#200**	
USCS		**AASHTO**	

TESTING DATA

	1	2	3	4	5	6
WM + WS	3917.2	3981.5	4023.9	4009.4		
WM	1970.4	1970.4	1970.4	1970.4		
WW + T #1	2311.6	2281.3	2280.3	2260.4		
WD + T #1	2150.9	2076.7	2047.1	2000.6		
TARE #1	446.0	275.0	276.2	261.5		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	9.4	11.4	13.2	14.9		
DRY DENSITY	117.7	119.5	120.0	117.3		

TEST RESULTS

Maximum dry density = 120.2 pcf

Optimum moisture = 12.7 %

Material Description

Olive brown SILT with sand. Bulk sample from 7 - 10'. Sample dropped off 7/1/2023.

Project No. 22-2164 **Client:** Rockridge Geotechnical

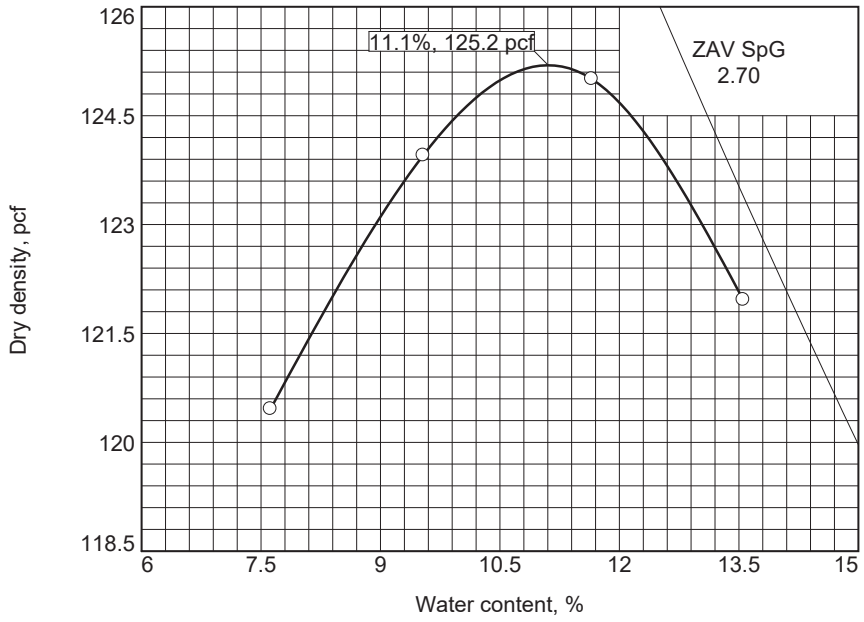
Project: 300 Piedmont Ave.

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

COMPACTION TEST REPORT

Date 07/26/23 | Project No. 22-2164 | Figure B-14



Curve No.
2

Test Specification:
ASTM D 1557-12 Method A Modified

Hammer Wt.: 10 lb.
Hammer Drop: 18 in.
Number of Layers: five
Blows per Layer: 25
Mold Size: 0.03333 cu. ft.

Test Performed on Material Passing #4 **Sieve**

Soil Data

NM _____ **Sp.G.** _____
LL _____ **PI** _____
%>#4 _____ **%<#200** _____
USCS _____ **AASHTO** _____

TESTING DATA

	1	2	3	4	5	6
WM + WS	3930.3	4023.1	4080.5	4064.2		
WM	1970.4	1970.4	1970.4	1970.4		
WW + T #1	2204.0	2491.2	2325.8	2245.8		
WD + T #1	2068.7	2313.1	2110.6	2010.7		
TARE #1	292.9	445.6	263.9	276.2		
WW + T #2						
WD + T #2						
TARE #2						
MOISTURE	7.6	9.5	11.7	13.6		
DRY DENSITY	120.5	124.0	125.0	122.0		

TEST RESULTS

Maximum dry density = 125.2 pcf

Optimum moisture = 11.1 %

Material Description

zOlive brown silty SAND. TP-3 Fill. Sample dropped off 7/19/2023.

Project No. 22-2164 **Client:** Rockridge Geotechnical
Project: 300 Piedmont Ave.

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

COMPACTION TEST REPORT

Date 07/26/23 | Project No. 22-2164 | Figure B-15

Project X
Corrosion Engineering
Corrosion Control – Soil, Water, Metallurgy Testing Lab

REPORT S220225F

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51	ASTM G200	SM 4500-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
RG-1: SANDY CLAY (CL), gray-brown mottled brown and red-brown	3	488.0	0.0488	21.4	0.0021	1,407	1,206	7.5	183	0.36	6.8	4.8	0.02	70.7	6.7	261.6	517.6	5.6	0.9
RG-4: SILTY SAND (SM) yellow-brown mottled olive-gray and red-yellow	2	4,298.8	0.4299	36.7	0.0037	3,685	1,139	6.8	208	0.33	2.4	0.3	0.02	86.7	7.6	79.5	1,280.8	8.9	6.4

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

29990 Technology Dr., Suite 13, Murrieta, CA 92563 Tel: 213-928-7213 Fax: 951-226-1720
www.projectxcorrosion.com

300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

SOIL CORROSIVITY TEST RESULTS

Date 07/26/23 | Project No. 22-2164 | Figure B-16a

Project X
Corrosion Engineering
Corrosion Control – Soil, Water, Metallurgy Testing Lab

REPORT S230718H

	Method	ASTM D4327		ASTM D4327		ASTM G187		ASTM G51	ASTM G200	SM 4500-D	ASTM D4327	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D6919	ASTM D4327	ASTM D4327
Bore# / Description	**Depth**	**Sulfates** SO_4^{2-}		**Chlorides** Cl^-		**Resistivity** As Rec'd | Minimum		**pH**	**Redox**	**Sulfide** S^{2-}	**Nitrate** NO_3^-	**Ammonium** NH_4^+	**Lithium** Li^+	**Sodium** Na^+	**Potassium** K^+	**Magnesium** Mg^{2+}	**Calcium** Ca^{2+}	**Fluoride** F_2^{--}	**Phosphate** PO_4^{3-}
	(ft)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(Ohm-cm)	(Ohm-cm)		(mV)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
RG-10: SILTY SAND with GRAVEL (SM), yellow-brown	5.8	3,600.3	0.3600	14.8	0.0015	7,370	1,139	7.0	161	ND	1.7	3.8	ND	55.7	11.3	42.0	1,702.8	2.0	2.4
RG-12: SILTY SAND (SM), gray	7.0	861.4	0.0861	14.1	0.0014	6,700	1,072	7.0	147	0.2	1.5	9.2	ND	69.0	14.7	41.7	522.3	3.2	0.8

Cations and Anions, except Sulfide and Bicarbonate, tested with Ion Chromatography
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
ND = 0 = Not Detected | NT = Not Tested | Unk = Unknown
Chemical Analysis performed on 1:3 Soil-To-Water extract
PPM = mg/kg (soil) = mg/L (Liquid)

Note: Sometimes a bad sulfate hit is a contaminated spot. Typical fertilizers are Potassium chloride, ammonium sulfate or ammonium sulfate nitrate (ASN). So this is another reason why testing full corrosion series is good because we then have the data to see if those other ingredients are present meaning the soil sample is just fertilizer-contaminated soil. This can happen often when the soil samples collected are simply surface scoops which is why it's best to dig in a foot, throw away the top and test the deeper stuff. Dairy farms are also notorious for these items.

29990 Technology Dr., Suite 13, Murrieta, CA 92563 Tel: 213-928-7213 Fax: 951-226-1720
www.projectxcorrosion.com

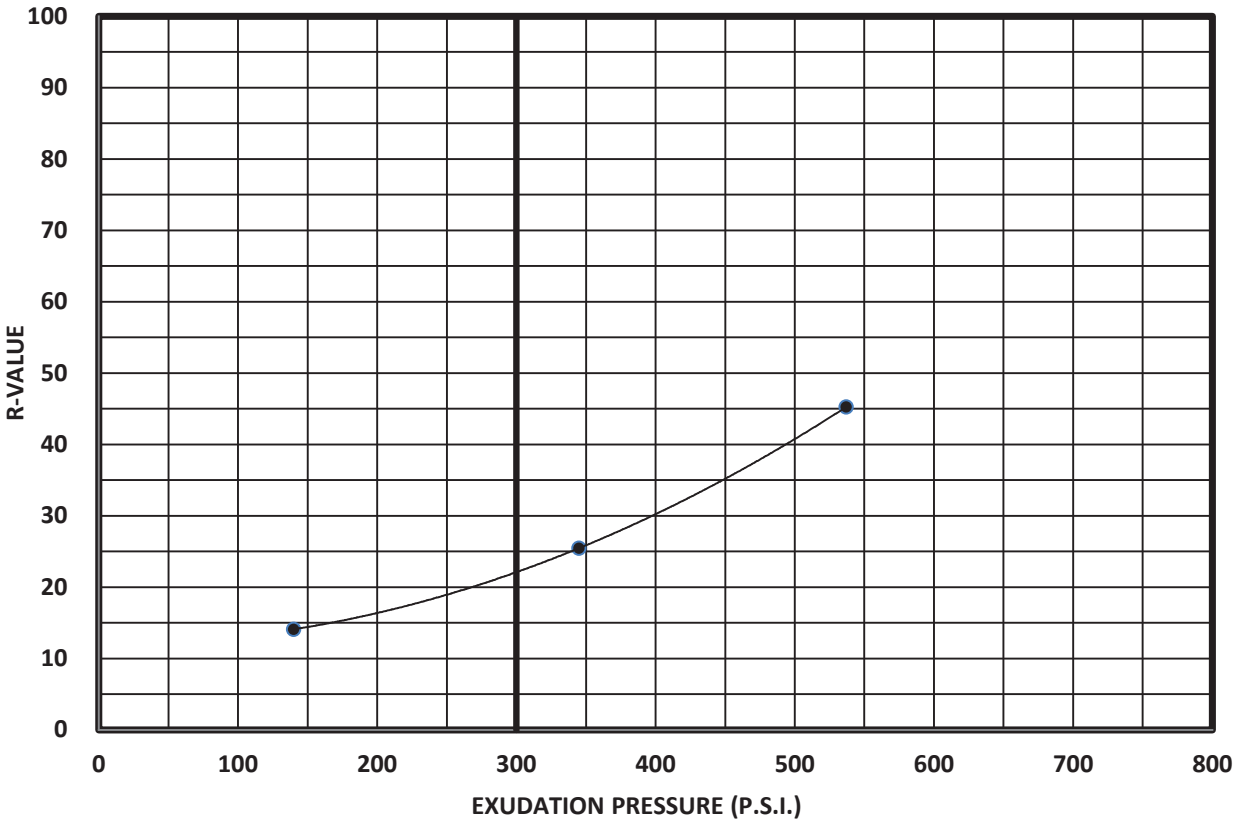
300 PIEDMONT AVENUE
San Bruno, California

ROCKRIDGE GEOTECHNICAL

SOIL CORROSIVITY TEST RESULTS

Date 07/26/23 | Project No. 22-2164 | Figure B-16b

R-VALUE CAL-TEST 301



Exudation (psi)	Compaction (psi)	Expansion (0.0001")	Expansion (psf)	Moisture %	Dry Density	Resistance Value
537	350	17	74	15.9	111.3	45
345	195	1	4	17.4	108.1	25
140	119	0	0	18.7	104.9	14

Test Results	Material Description
R-Value at 300 psi exudation pressure = 22	CLAYEY SAND with GRAVEL (SC), olive-brown; and CLAYEY SAND (SC), yellow-brown
	Sample Source: RG-11 at 1-5 feet

300 PIEDMONT AVENUE
San Bruno, California

RESISTANCE VALUE TEST REPORT

ROCKRIDGE GEOTECHNICAL

Date 08/02/23	Project No. 22-2164	Figure B-17

ROCKRIDGE GEOTECHNICAL

APPENDIX C

Boring Logs and Laboratory Test Results by Cleary Consultants, Inc.

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISION
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines
			SC	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

U.S. STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

200	40	10	4	3/4"	3"	12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

GRAIN SIZES

SANDS AND GRAVELS	BLOWS/FOOT ✧
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

SILTS AND CLAYS	STRENGTH ☆	BLOWS/FOOT ✧
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

CONSISTENCY

✧ Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split barrel (ASTM D-1586).

☆ Unconfined compressive strength in tons/sq.ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

KEY TO EXPLORATORY BORING LOGS

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

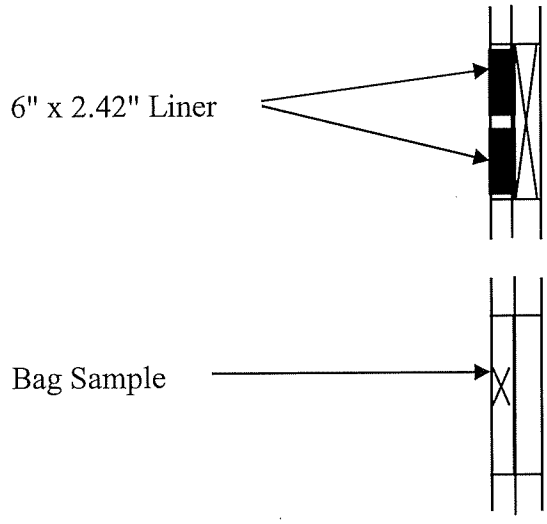
PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	6

FIELD SAMPLING PROCEDURES

The soils encountered in the borings were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D-2487).

Representative soil samples were obtained from the borings at selected depths appropriate to the soil investigation. All samples were returned to our laboratory for classification and testing.

In accordance with the ASTM D1586 procedure, the standard penetration resistance was obtained by dropping a 140 pound hammer through a 30-inch free fall. The 2-inch O.D. Standard split barrel sampler was driven 18 inches or to practical refusal and the number of blows were recorded for each 6-inch penetration interval. The blows per foot recorded on the boring logs represent the accumulated number of blows, or N-value, required to drive the penetration sampler the final 12 inches. In addition, 3-inch O.D. x 2.42-inch I.D. drive samples were obtained using a Modified California Sampler and 140 pound hammer. Blow counts for the Modified California Sampler were converted to standard penetration resistance by multiplying by 0.6. The sampler type is shown on the boring logs in accordance with the designation below.



Where obtained, the shear strength of the soil samples using either Torvane (TV) or Pocket Penetrometer (PP) devices is shown on the boring logs in the far right hand column.

CLEARY CONSULTANTS, INC. *Geotechnical Engineers and Geologists*	SUMMARY OF FIELD SAMPLING PROCEDURES GEOTECHNICAL FEASIBILITY INVESTIGATION Peninsula High School (APN 019-170-020) 300 Piedmont Ave, San Bruno, California		
	PROJECT NO.	**DATE**	**DRAWING NO.**
	1276.6C	May 2020	7

LABORATORY TESTING PROCEDURES

The laboratory testing program was directed toward a quantitative and qualitative evaluation of the physical and mechanical properties of the soils underlying the site.

The natural water content was determined on 102 samples of the materials recovered from the borings in accordance with the ASTM D2216 Test Procedure. These water contents are recorded on the boring logs at the appropriate sample depths.

Dry density determinations were performed on 80 samples to measure the unit weight of the subsurface soils in accordance with the ASTM D2937 Test Procedure. The results of these tests are shown on the boring logs at the appropriate sample depths.

Atterberg Limit determinations were performed on 12 samples of the subsurface soils in accordance with the ASTM D4318 Test Procedure to determine the range of water contents over which the materials exhibited plasticity. The Atterberg Limits are used to classify the soils in accordance with the Unified Soil Classification System and to evaluate the soil's expansion potential. The results of these tests are presented on Drawings 24 and 25 and on the boring logs at the appropriate sample depths.

The percent soil fraction passing the #200 sieve and #4 sieves was determined on 29 samples of the subsurface soils in accordance with the ASTM D1140 Test Procedure to aid in the classification of the soils. The results of these tests are shown on the boring logs at the appropriate sample depths.

Free swell tests were performed on 29 soil samples to evaluate the swelling potential. The tests were performed by slowly pouring 10 ml of air-dried soil passing the No. 40 sieve into a 100 ml graduated cylinder filled with approximately 90 ml of distilled water. The suspension was stirred repeatedly to ensure thorough wetting of the soil specimen. The cylinder was then filled to 100 ml with distilled water and allowed to settle until equilibrium was reached (approximately 24 hours). The free swell volume of the soil was then noted. The percent free swell was calculated by subtracting the initial soil volume from the free swell volume, dividing by the initial volume, and multiplying the result by 100 percent. The test results are presented on the boring logs.

Corrosion testing was performed on a composite sample of the surficial soil materials by Cooper Testing Labs. Testing included resistivity, pH, chloride and sulfate testing performed in accordance with ASTM G57, ASTM G51, Caltrans 422 (modified) and Caltrans 417(modified), respectively. The results of these tests are presented on Drawing 26 and is discussed in Section C, Soil Corrosivity.

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	375' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/25/20

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
Irrigated Grass Playfield									
SANDY CLAY TO SANDY SILT, moist, fine to occasionally coarse grained sand, fine rootlets	Brown	Very Stiff	CL-ML	1					
@1.5': Liquid Limit = 26 % Plasticity Index = 7 % Finer Than #4 = 100% Finer Than #200 = 61% Free Swell = 40%				2		22	11 15	109 112	
@3.0': fine subangular gravel, no rootlets	Grayish Brown			3		24	16		
@4.0' (Bottom): some bivalve shell fragments		Hard		4					
						44	18 18	103 113	
CLAYEY TO SILTY SAND, moist, fine to occasionally coarse grained sand, slightly weathered sandstone clasts	Yellowish Brown	Very Dense	SC-SM	5					
@6.0': Liquid Limit = 25 % Plasticity Index =5 % Finer Than #4 = 62% Finer Than #200 = 32% Free Swell = 25%				6		53	11		
				7					
SANDSTONE, moist, fine to medium grained sand, moderately to intensely weathered, friable, massive, fossiliferous (bivalve shells), iron oxidation, mottled discoloration	Grayish Brown	(Very Dense)	(SC-SM)	8					
(Merced Formation)				9		30/5"	18	101	
				10					
@8.5': Finer Than #4 = 100% Finer Than #200 =39% Free Swell = 25%	Bluish Gray			11					
				12					
				13					
@13.5': slightly weathered, no oxidation discoloration Finer Than #4 = 100% Finer Than #200 = 37% Free Swell = 25%				14		30/6"	16	108	
				15					
				16					
				17					
				18					
				19		56/9"	16	114	
				20					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 1

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	9

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	375' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/25/20

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SANDSTONE, moist, continued... (Merced Formation)	Bluish Gray	(Very Dense)	(SC-SM)	21					
				22					
				23					
				24		57/9"	17	104	
				25					
				26					
				27					
				28					
				29		30/3"	16	104	
				30					
				31					
				32					
				33					
				34		30/5"	16	105	
				35					
				36					
				37					
				38					
				39		30/3"	17	105	
				40					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 1

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	10

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	375' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/25/20

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SANDSTONE, moist, continued	Bluish Gray	(Very Dense)	(SC-SM)	41					
				42					
				43					
@43.5': decreased fossil content					☒	30/3"	15	111	
				44					
				45					
				46					
				47					
				48					
					☒	30/2"	17	107	
Bottom of Boring = 48.75'				49					
				50					
				51					
				52					
				53					
				54					
				55					
				56					
				57					
				58					
				59					
				60					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 1

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	11

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	382' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	10.5'	DATE DRILLED	2/25/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Irrigated Grass Playfield SANDY SILT, moist, fine to medium grained sand, decomposed sandstone clasts, fine rootlets @1.5': Liquid Limit = 34 % Plasticity Index = 8 % Finer Than #4 = 99% Finer Than #200 = 61% Free Swell = 40%	Grayish Brown	Very Stiff	ML	1			12	86	
				2		31	14	110	
		Hard		3		46	13		
SANDY CLAY TO SANDY SILT, moist, fine to coarse grained sand, slightly weathered sandstone clasts, bivalve shell fragments @4.0': Liquid Limit = 30 % Plasticity Index = 7 % Finer Than #4 = 99% Finer Than #200 = 56% Free Swell = 40%	Gray	Hard	CL-ML	4		53	10	111	
				5					
				6		46	9		
CLAYEY TO SILTY SAND, moist, fine to coarse grained sand, slightly weathered sandstone clasts, bivalve shell fragments @9.0': Finer Than #4 = 93% Finer Than #200 = 47% Free Swell = 20%	Brown	Dense	SC-SM	7					
				8					
				9			10	97	
@9.5': Finer Than #4 = 99% Finer Than #200 = 47% Free Swell = 25%	Gray			10		34	11	114	
SANDSTONE, moist, fine to medium grained sand, moderately weathered, massive, iron and manganese oxidation (Merced Formation) @13.5': Finer Than #4 = 100% Finer Than #200 = 44% Free Swell = 30%	Brown	(Very Dense)	(SC-SM)	11					
				12					
				13					
				14		30/6"	14	110	
				15					
				16					
				17					
@18.5' (Bottom): mottled discoloration				18					
	Gray			19		30/5"	15	109	
				20					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

LOG OF EXPLORATORY BORING NO. 2

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	12

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	382' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	10.5'	DATE DRILLED	2/25/20

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SANDSTONE, moist, continued...	Gray	(Very Dense)	(SC-SM)	21					
(Merced Formation)	Bluish Gray			22					
				23					
@23.5': slightly to moderately weathered, no oxidation/discoloration				24	X	30/5"	17	104	
				25					
				26					
				27					
				28					
@28.5': fossiliferous (bivalve shells)				29	X	30/6"	16	105	
				30					
				31					
				32					
				33					
@33.5': no fossil content				34	X	30/5"	13	112	
Bottom of Boring = 34.5' (Practical Drilling Refusal)				35					
				36					
				37					
				38					
				39					
				40					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

LOG OF EXPLORATORY BORING NO. 2

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	13

EQUIPMENT	6" Diameter Solid Flight Auger*	ELEVATION	382' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	3.75'	DATE DRILLED	2/25/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Irrigated Grass Playfield SANDY CLAY, moist, fine to medium grained sand, decomposed sandstone clasts, fine rootlets @1.0': Liquid Limit = 29% Plasticity Index = 10% Finer Than #4 = 100% Finer Than #200 = 54% Free Swell = 50%	Dark Grayish Brown	Hard	CL	1			11	103	
				2		43	15	109	
SILTY SAND, moist, fine to medium grained sand	Yellowish Brown	Dense	SM	3		40	18		
@3.0': Liquid Limit = 28 % Plasticity Index = 5 % Finer Than #4 = 100% Finer Than #200 = 44% Free Swell = 35%		(Dense)	(SC-SM)	4		46	18 19	104 105	
		(Very Dense)		5					
SANDSTONE, moist, fine to medium grained sand, intensely weathered, friable, massive (Merced Formation) @4.0': Finer Than #4 = 100% Finer Than #200 = 45% Free Swell = 30% @6.0': mottled discoloration @8.5': iron oxidation, moderately weathered	Yellowish Brown			6		70	18		
				7					
				8					
				9		56"	19 18	 109	
				10					
				11					
	Gray			12					
				13					
				14		54"	18 18	106 111	
				15					
				16					
				17					
				18					
				19		50/9"	19	108	
Bottom of Boring = 19.25' * Drilled with CME-75 Truck Mounted Rig				20					

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 3

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	14

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	392' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/26/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Non-Irrigated Grass Landscaping SANDY CLAY TO SANDY SILT, moist, fine to medium grained sand, very intensely weathered to decomposed sandstone clasts, fine rootlets	Grayish Brown	Very Stiff	CL-ML	1		23	15	89	
@1.5': Liquid Limit = 28 % Plasticity Index = 6 % Finer Than #4 = 100% Finer Than #200 = 52% Free Swell = 30%	Yellowish Brown			2			15	110	
@3.0': no rootlets				3		27	19		
				4		28	19	106	
SANDY CLAY, moist, fine to medium grained sand, very intensely weathered to decomposed sandstone clasts, bivalve shell fragments	Gray	Hard	CL	5					
@6.0': Liquid Limit = 28 % Plasticity Index = 8 % Finer Than #4 = 97% Finer Than #200 = 52% Free Swell = 30%				6		37	16		
				7					
SANDSTONE, moist, fine to medium grained sand, moderately weathered, friable, massive	Bluish Gray	(Medium Dense)	(SC-SM)	8					
(Merced Formation)				9		26	19		
@9.5': Finer Than #4 = 84% Finer Than #200 = 47% Free Swell = 25%				10			14	116	
				11					
		(Dense)		12					
				13					
@13.5': fossiliferous (bivalve shells), possible 1/2" thick subvertical bed (very faint/indistict)				14		48	17	104	
				15			17	112	
				16					
		(Very Dense)		17					
				18					
@18.5': slightly weathered				19		51/11"	18	100	
				20			18	112	

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 4

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	15

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	392' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/26/20

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SANDSTONE, moist, continued...	Bluish Gray	(Very Dense)	(SC-SM)	21					
(Merced Formation)				22					
				23					
				24		53	22	108	
				25			21	106	
				26					
				27					
				28					
@28.75': decreased fossil content				29		46/9"	19	108	
				30					
				31					
				32					
				33					
@34.0': no fossil content				34		53/11"	17	111	
				35					
				36					
	Gray			37					
				38					
				39		51/7"	17	111	
* Drilled with CME-75 Truck Mounted Rig				40					

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 4

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	16

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	392' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/26/20

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SANDSTONE, moist, continued	Gray	(Very Dense)	(SC-SM)	41					
(Merced Formation)				42					
				43					
				44		43/9"	16	115	
				45					
				46					
	Dark Gray			47					
				48					
				49			16	115	
@49.0': fossiliferous (bivalve shells)						59/9"	18	115	
Bottom of Boring = 49.75'				50					
				51					
				52					
				53					
				54					
				55					
				56					
				57					
				58					
				59					
				60					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 4

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	17

EQUIPMENT	8" Diameter Hollow Stem Auger*	ELEVATION	394' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	3.5'	DATE DRILLED	2/25/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Parking Lot Island (Soil Landscaping) CLAYEY TO SILTY SAND, moist, fine to occasionally medium grained sand, mottled discoloration, iron oxidation @1.5': Liquid Limit = 27 % Plasticity Index = 6 % Finer Than #4 = 99% Finer Than #200 = 48% Free Swell = 40%	Grayish Brown	Medium Dense	SC-SM	1 2 3		14 26	12 13 18	90 108	
SANDSTONE, moist, fine to medium grained sand, mottled discoloration, iron oxidation, very intensely weathered, friable, massive (Merced Formation) @4.5': Liquid Limit = 27 % Plasticity Index = 6 % Finer Than #4 = 100% Finer Than #200 = 50% Free Swell = 20%	Gray	(Dense) (Very Dense)	(SC-SM)	4 5 6		46 54	18 19 18	105 106	
@9.0': intensely weathered				7 8 9 10		52	17 17	107 110	
@13.5': moderately weathered	Yellowish Brown	(Dense)		11 12 13 14		43	18 18	106 110	
Bottom of Boring = 19.5' * Drilled with CME-75 Truck Mounted Rig				15 16 17 18 19 20		48	18 18	105 111	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 5

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	18

EQUIPMENT	6" Diameter Solid Flight Auger*	ELEVATION	401' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	6.0'	DATE DRILLED	2/26/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Irrigated Grass Landscaping									
SANDY CLAY TO SANDY SILT, moist, fine to medium grained sand, intensely weathered sandstone clasts, iron oxidation, mottled discoloration	Brown	Very Stiff	CL-ML	1					
						32	11	115	
				2			17	112	
@1.5': Liquid Limit = 31 % Plasticity Index = 8 % Finer Than #4 = 94% Finer Than #200 = 54% Free Swell = 40%	Yellowish Brown	Stiff							
				3		12			
@3.0': Finer Than #4 = 98% Finer Than #200 = 56% Free Swell = 20%							20		
				4					
@4.0': saturated						13	22	104	
@4.5': moist Finer Than #4 = 92% Finer Than #200 = 52% Free Swell = 20%				5			17	112	
		Very Stiff							
				6		27			
		(Medium Dense)	(SC-SM)				22		
SANDSTONE, moist, fine to medium grained sand, fossiliferous (bivalve shells), very intensely weathered, friable, massive	Bluish Gray			7					
(Merced Formation)		(Very Dense)		8					
@8.75': moderately to slightly weathered Finer Than #4 = 100% Finer Than #200 = 52% Free Swell = 25%				9		55/9"	16	110	
				10					
				11					
				12					
				13					
@13.5': no fossil content, iron oxidation				14		30/6"	16	109	
				15					
				16					
				17					
				18					
@18.25': no oxidation				19		50/9"	14	112	
Bottom of Boring = 19.25' * Drilled with CME-75 Truck Mounted Rig				20					

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 6

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	19

EQUIPMENT	6" Diameter Solid Flight Auger*	ELEVATION	413' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/26/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Non-Irrigated Grass Landscaping	Brown	Stiff	CL	1					
SANDY CLAY, moist, fine to medium grained sand, fine rootlets									
@1.5': 1/2" diameter tree root Finer Than #4 = 99% Finer Than #200 = 59% Free Swell = 35%						16	12 14	102	
	Grayish Brown	Very Stiff		2					
				3		18	18		
@3.0': decomposed sandstone clasts,fine rootlets, iron oxidation, mottled discoloration Liquid Limit = 30 % Plasticity Index = 8 % Finer Than #4 = 96% Finer Than #200 = 56% Free Swell = 40%		Hard		4		49	17 19	109 111	
		Very Stiff		5					
@4.0': moderately weathered sandstone clasts						29			
@6.0': Finer Than #4 = 98% Finer Than #200 = 55% Free Swell = 30%				6			18		
				7					
CLAYSTONE, moist, fine to medium grained sand, intensely weathered, friable, massive, iron oxidation, mottled discoloration	Yellowish Brown	(Hard)	(CL)	8					
(Merced Formation)				9		52/11"	17 16	102 111	
@9.0': Finer Than #4 = 100% Finer Than #200 = 62% Free Swell = 40%				10					
				11					
				12					
				13					
@13.5'(Bottom): slightly weathered				14		30/6"	16	110	
				15					
				16					
SANDSTONE, moist, fine to medium grained sand, slightly weathered, massive	Bluish Gray	(Very Dense)	(SC-SM)	17					
(Merced Formation)				18					
				19		45/9"	16	110	
				20					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

LOG OF EXPLORATORY BORING NO. 7

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	20

EQUIPMENT	6" Diameter Solid Flight Auger*	ELEVATION	413' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	7.5'	DATE DRILLED	2/26/20

DESCRIPTION AND CLASSIFICATION				DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE						
SANDSTONE, moist, continued... (Merced Formation)	Bluish Gray	(Very Dense)	(SC-SM)	21 22 23					
@23.5': slightly fossiliferous (bivalve shell fragments)				24	X	36/5"	15		
Bottom of Boring = 24.0'				25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 7

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	21

EQUIPMENT	6" Diameter Solid Flight Auger*	ELEVATION	411' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	4.25'	DATE DRILLED	2/26/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Irrigated Grass Landscaping SANDY CLAY, moist, fine to medium grained sand, very intensely weathered to decomposed sandstone clasts, iron oxidation, mottled discoloration	Grayish Brown	Hard	CL	1					
@1.5': Liquid Limit = 35 % Plasticity Index = 13 % Finer Than #4 = 99% Finer Than #200 = 64% Free Swell = 40%				2		35	11 17	108 109	
@3.0': fresh sandstone clast	Yellowish Brown			3		70	15		
@4.0': Finer Than #4 = 99% Finer Than #200 = 59% Free Swell = 30%				4		52	16		
SANDSTONE, moist, fine to medium grained sand, very intensely weathered, fractured, iron oxidation, mottled discoloration, friable, massive (Merced Formation)	Grayish Brown	(Dense)	(SC-SM)	5					
				6		88/11"	17		
				7					
	Bluish Gray			8					
@8.5'(Top): moderately weathered, no fracturing, no discoloration @8.5'(Bottom): slightly to moderately weathered, no oxidation				9		36/6"	15	111	
				10					
				11					
				12					
				13		30/3"	16	106	
Bottom of Boring = 13.75'				14					
				15					
				16					
				17					
				18					
				19					
				20					

* Drilled with CME-75 Truck Mounted Rig

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 8

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	22

EQUIPMENT	6" Diameter Solid Flight Auger*	ELEVATION	414' MSL	LOGGED BY	CMc
DEPTH TO GROUNDWATER	Not Enc.	DEPTH TO BEDROCK	2.0'	DATE DRILLED	2/26/20

DESCRIPTION AND REMARKS	COLOR	CONSIST.	SOIL TYPE	DEPTH (FEET)	SAMPLER	PENETRATION RESISTANCE (BLOWS/FT)	WATER CONTENT (%)	DRY DENSITY (PCF)	SHEAR STRENGTH (KSF)
Parking Lot Island (Soil Landscaping) CLAYEY TO SILTY SAND, moist, fine to medium grained sand, slightly weathered sandstone clasts, fine rootlets @1.5': Finer Than #4 = 89% Finer Than #200 = 40% Free Swell = 30%	Grayish Brown	Medium Dense	SC-SM	1		20			
		(Hard)	(CL)	2		50/6"	8		
CLAYSTONE, dry, fine to occasionally medium grained sand, fresh (Merced Formation) @4.0': Finer Than #4 = 100% Finer Than #200 = 63% Free Swell = 30%	Light Bluish Gray			3					
				4		30/2"	6	91	
				5		50/3"			
	Bluish Gray			8					
				9		36/4"			
Bottom of Boring = 9.25" (Practical Drilling Refusal)				10					
				11					
				12					
				13					
				14					
				15					
				16					
				17					
				18					
				19					
				20					

* Drilled with CME-75 Truck Mounted Rig

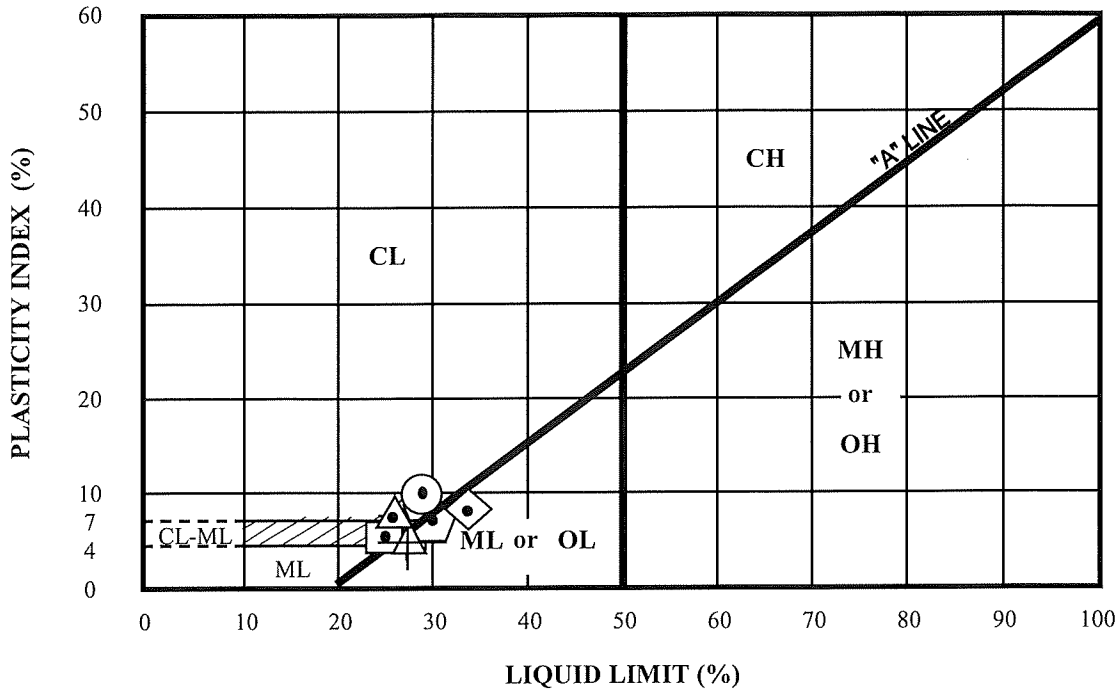
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

LOG OF EXPLORATORY BORING NO. 9

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	23



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
△	1	1.5	15	26	7	61	-0.6	CL - ML
□	1	6.0	11	25	5	32	-1.8	SC* - SM*
◇	2	1.5	14	34	8	61	-1.5	ML
▽	2	4.0	10	30	7	56	-1.9	CL - ML
○	3	1.0	11	29	10	54	-0.8	CL
⋔	3	3.0	18	28	5	44	-1.0	SM*
⊞	4	1.5	15	28	6	52	-1.2	CL - ML
⊕	4	6.0	16	28	8	52	-0.5	CL

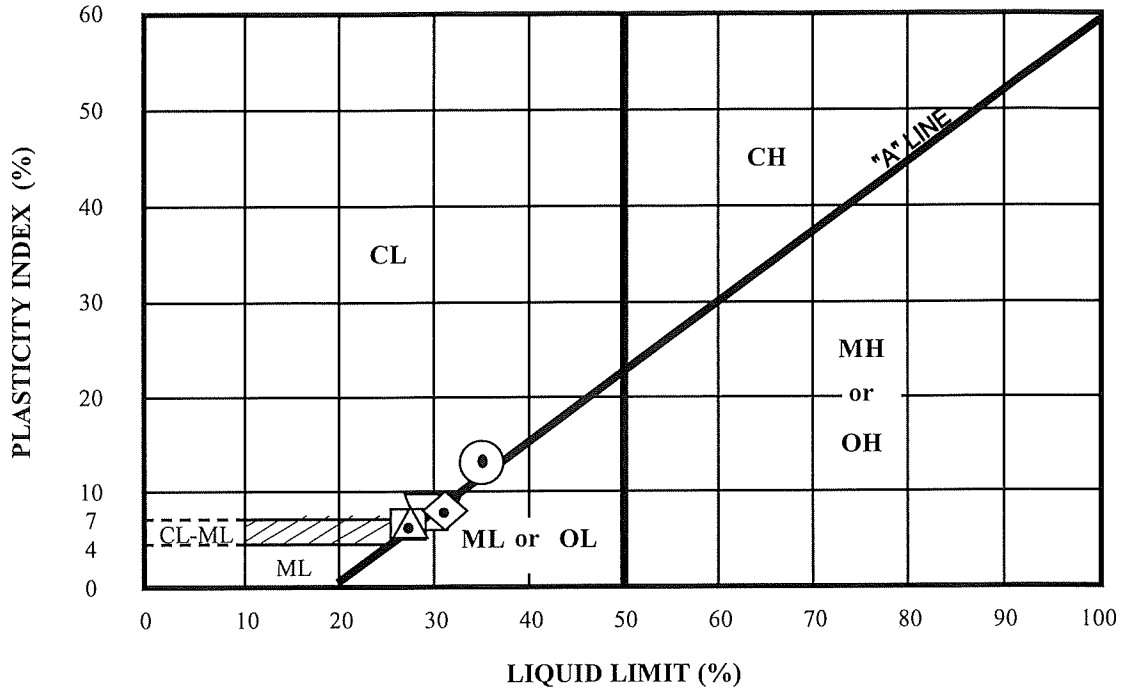
*Classified as coarse-grained soil since less than 50% passes #200 sieve

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

PLASTICITY CHART

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	24



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
△	5	1.5	13	27	6	48	-1.3	SC* - SM*
□	5	4.5	19	27	6	50	-0.3	(SC* - SM*)
◇	6	1.5	17	31	8	54	-0.8	CL - ML
▽	7	3.0	18	30	8	56	-0.5	CL
○	8	1.5	17	35	13	64	-0.4	CL

*Classified as coarse-grained soil since less than 50% passes #200 sieve

CLEARY CONSULTANTS, INC.
Geotechnical Engineers and Geologists

PLASTICITY CHART

GEOTECHNICAL FEASIBILITY INVESTIGATION
Peninsula High School (APN 019-170-020)
300 Piedmont Ave, San Bruno, California

PROJECT NO.	DATE	DRAWING NO.
1276.6C	May 2020	25

COOPER TESTING LABORATORY

Corrosivity Tests Summary

CTL # 018-1038 Date: 3/6/2020 Tested By: PJ Checked: PJ

Client: Cleary Consultants Project: Peninsula High School - Geotechnical Feasibility Investigation Proj. No: 1276.6C

Remarks:

Sample Location or ID			Resistivity @ 15.5 °C (Ohm-cm)			Chloride	Sulfate		pH	ORP (Redox)		Sulfide	Moisture	Soil Visual Description
			As Rec.	Min	Sat.	mg/kg	mg/kg	%				Qualitative	At Test	
						Dry Wt.	Dry Wt.	Dry Wt.		E_H (mv)	At Test	by Lead	%	
Boring	Sample, No.	Depth, ft.	ASTM G57	Cal 643	ASTM G57	ASTM D4327	ASTM D4327	ASTM D4327	ASTM G51	ASTM G200	Temp °C	Acetate Paper	ASTM D2216	
EB-1-9	-	0.5-3.0	-	-	1,393	7	2,606	0.2606	7.7	275	22	-	15.1	Dark Brown Sandy CLAY

DRAWING NO. 26

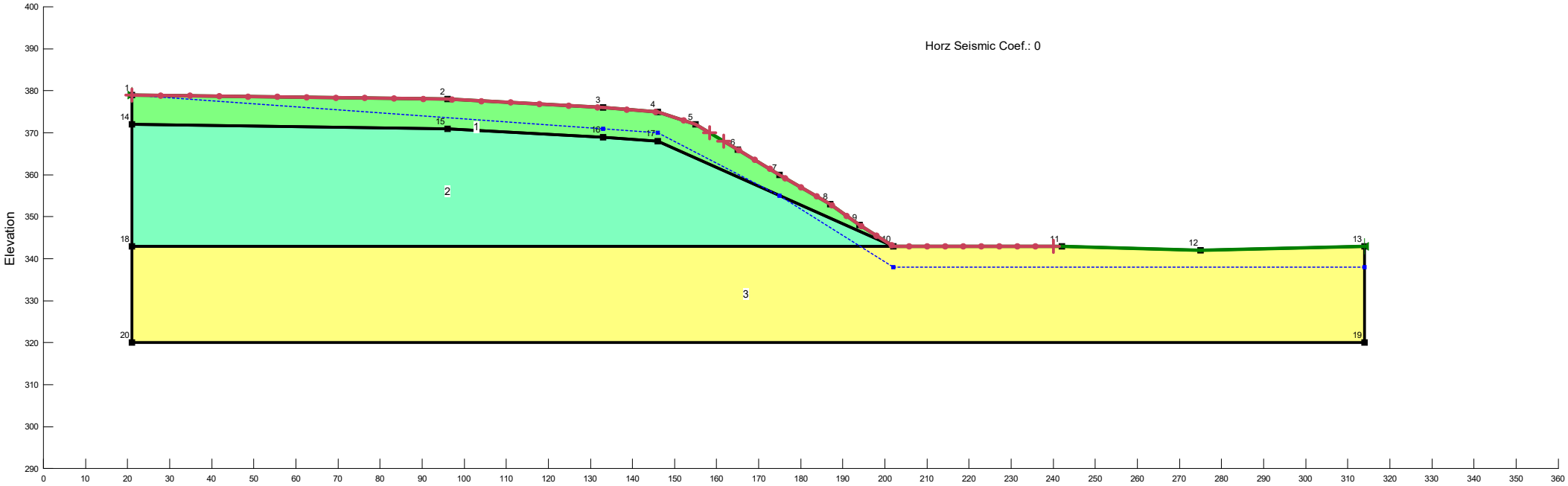
ROCKRIDGE GEOTECHNICAL

APPENDIX D
Slope Stability Analysis Results

Name: 300 Piedmont Slope Stability Evaluation Cross Section A-A'(5)

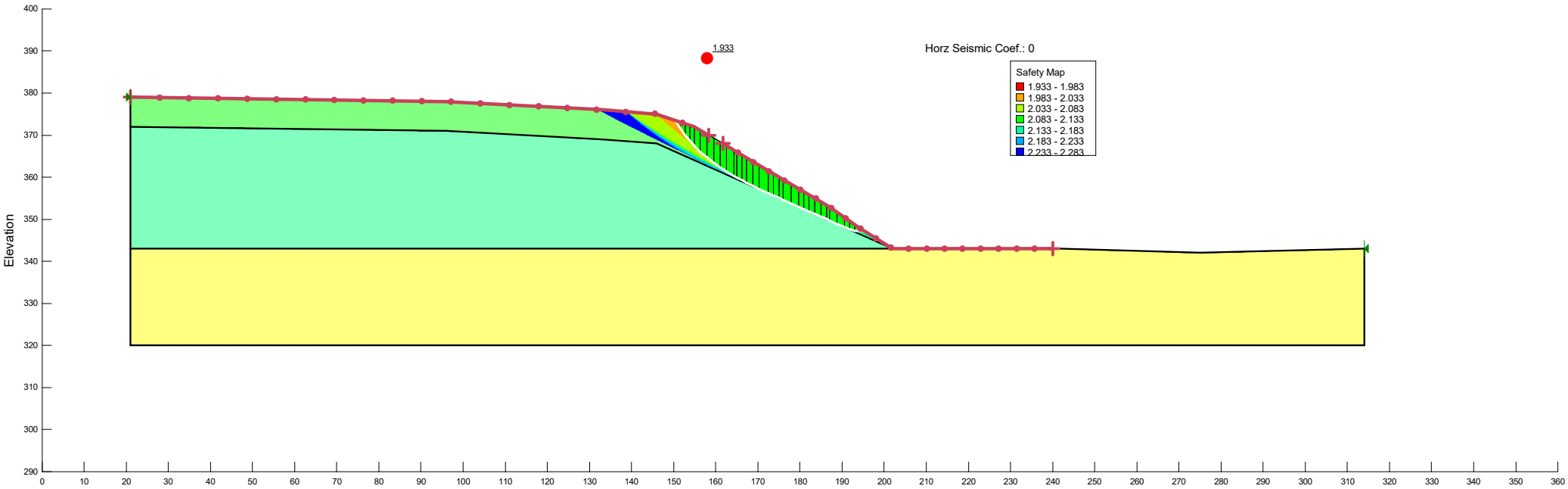
Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °

Horz Seismic Coef.: 0



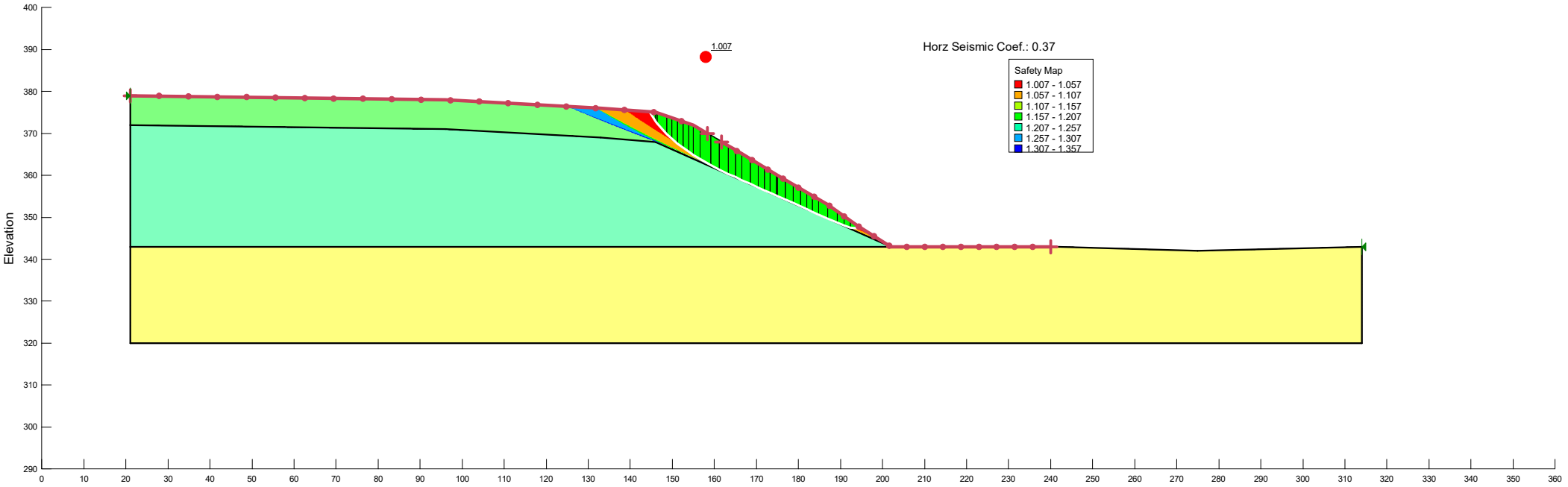
Name: 300 Piedmont Slope Stability Evaluation Cross Section A-A'(5)_no GWT

Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °



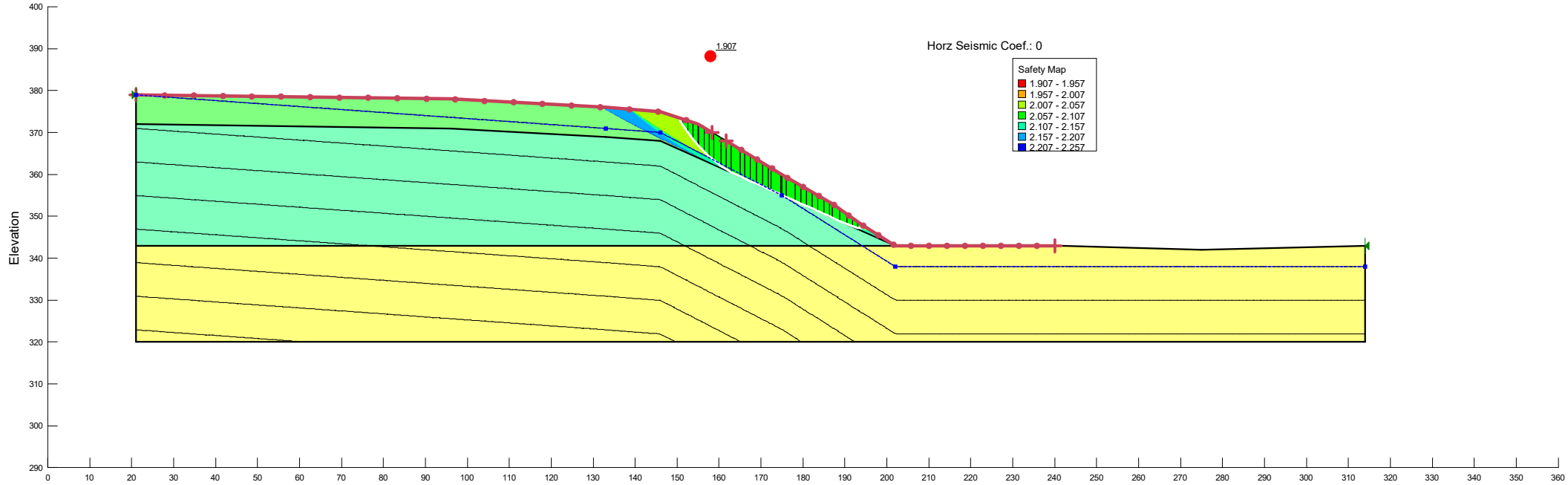
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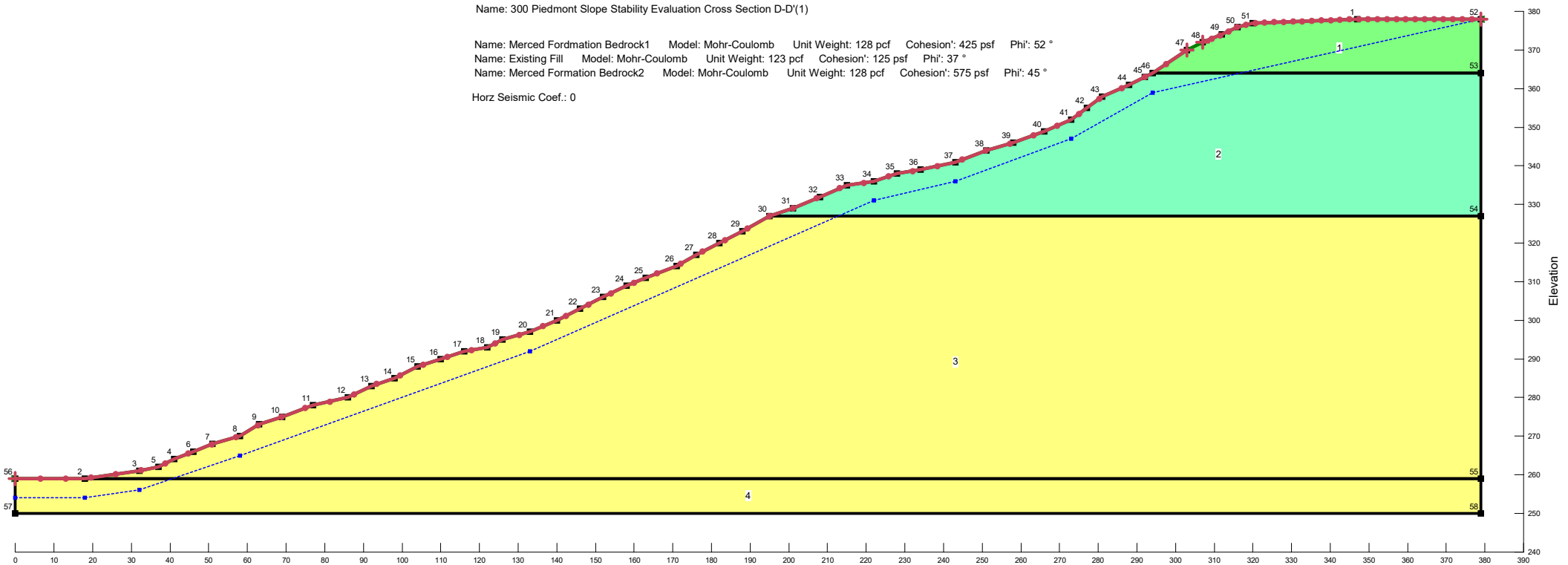
Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °

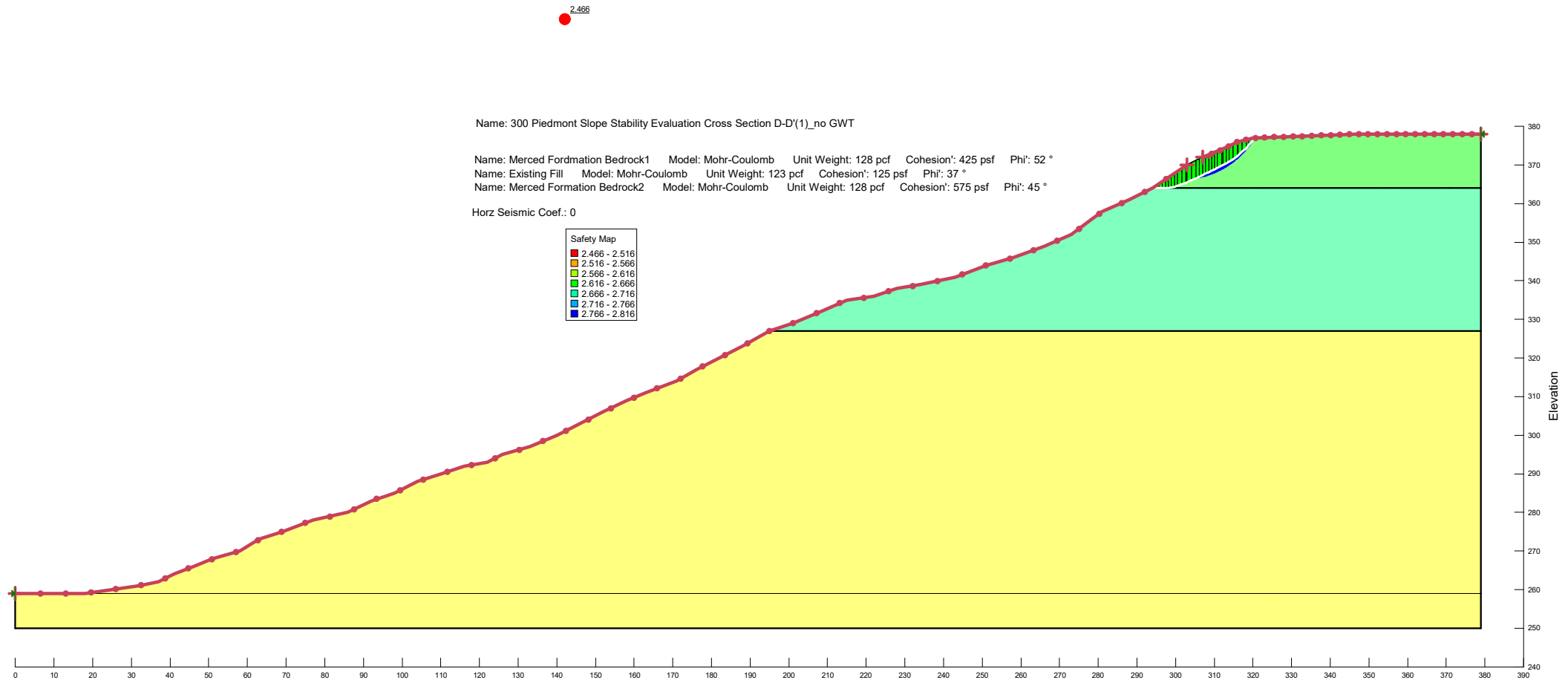


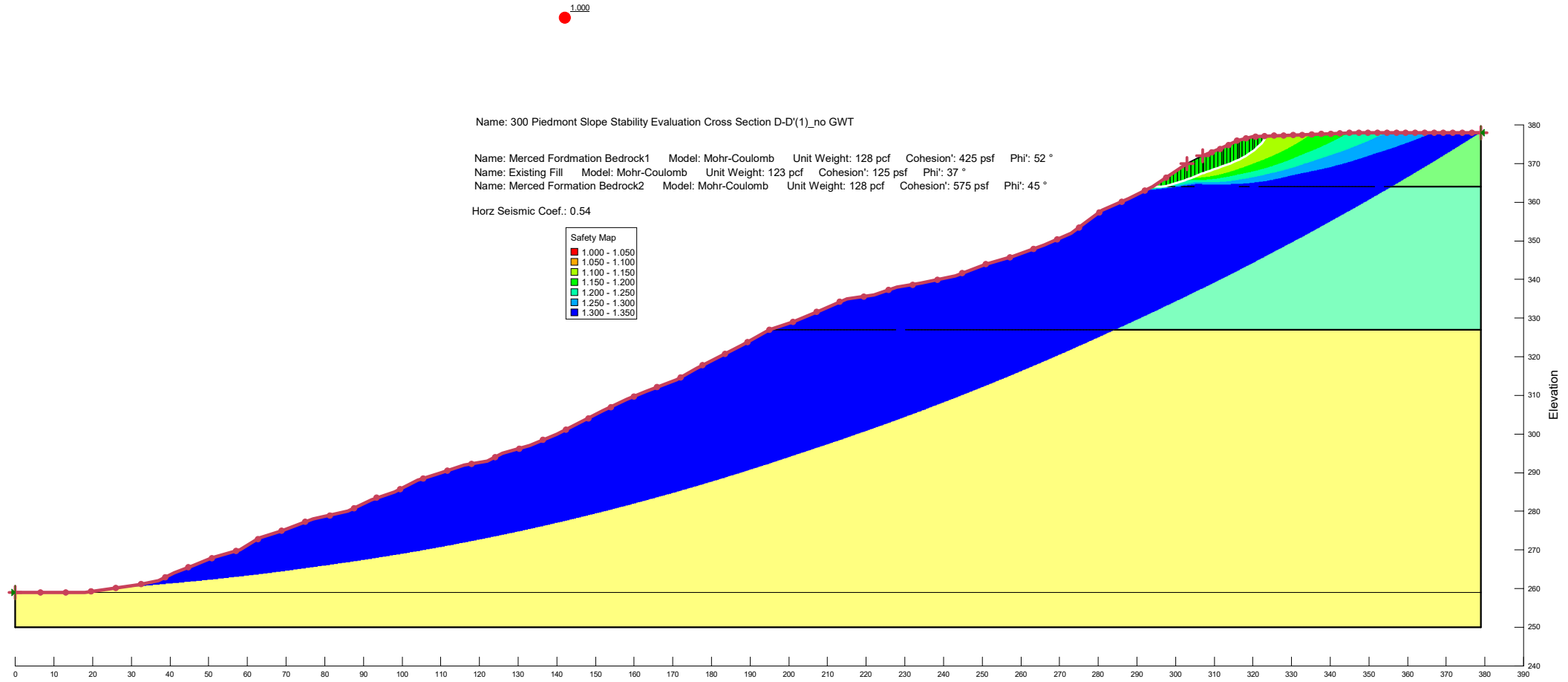
Name: 300 Piedmont Slope Stability Evaluation Cross Section A-A'(5)

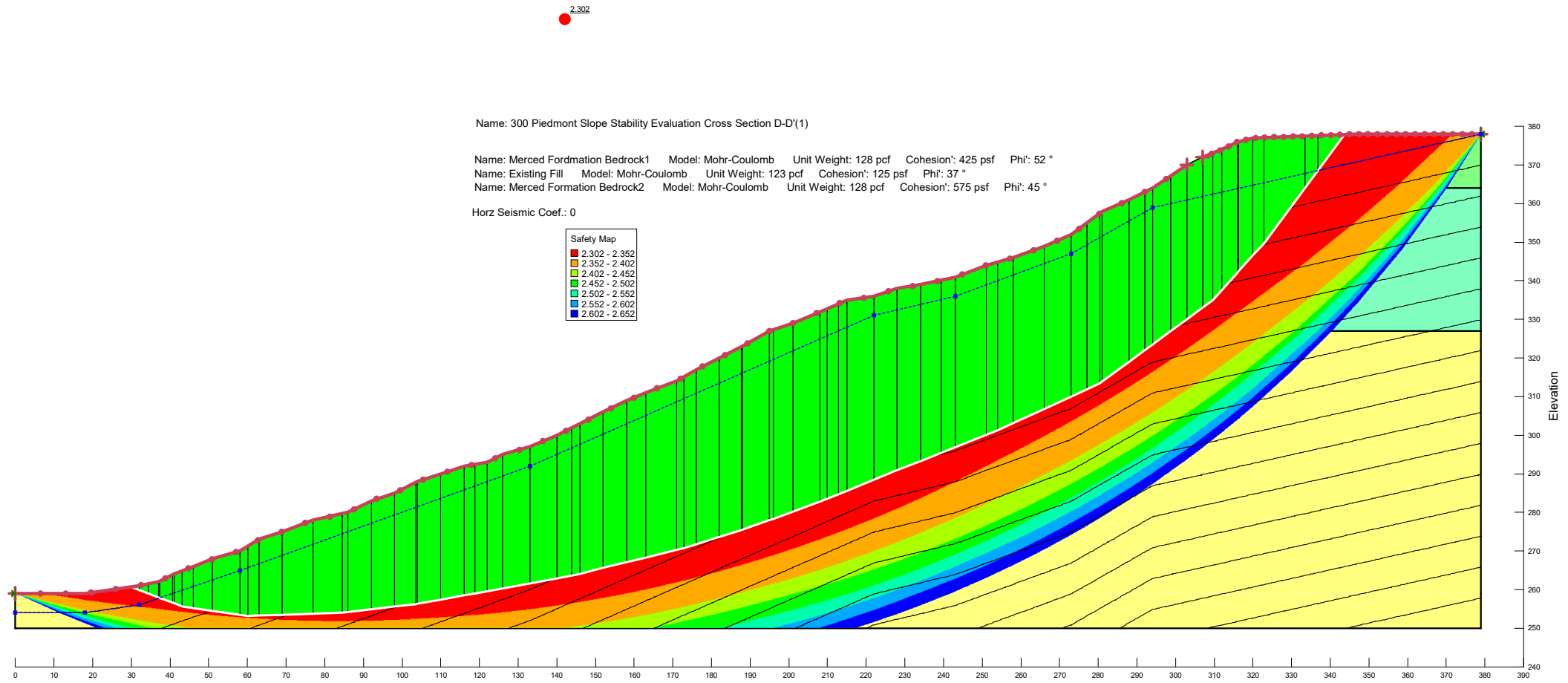
Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °

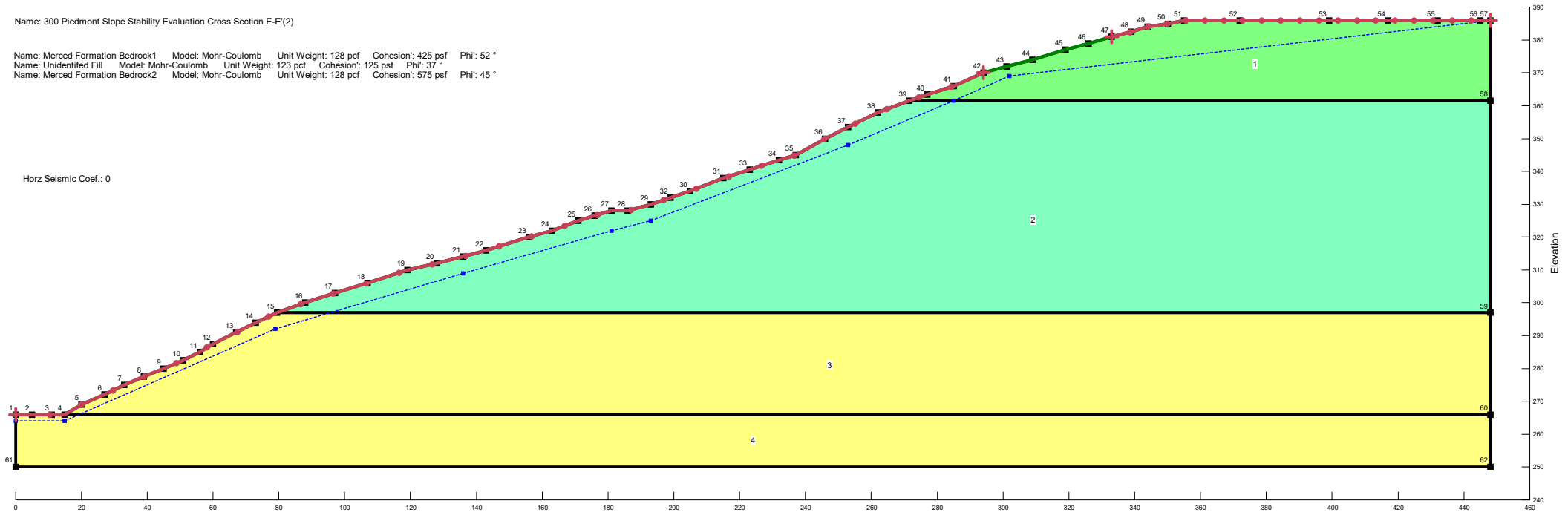


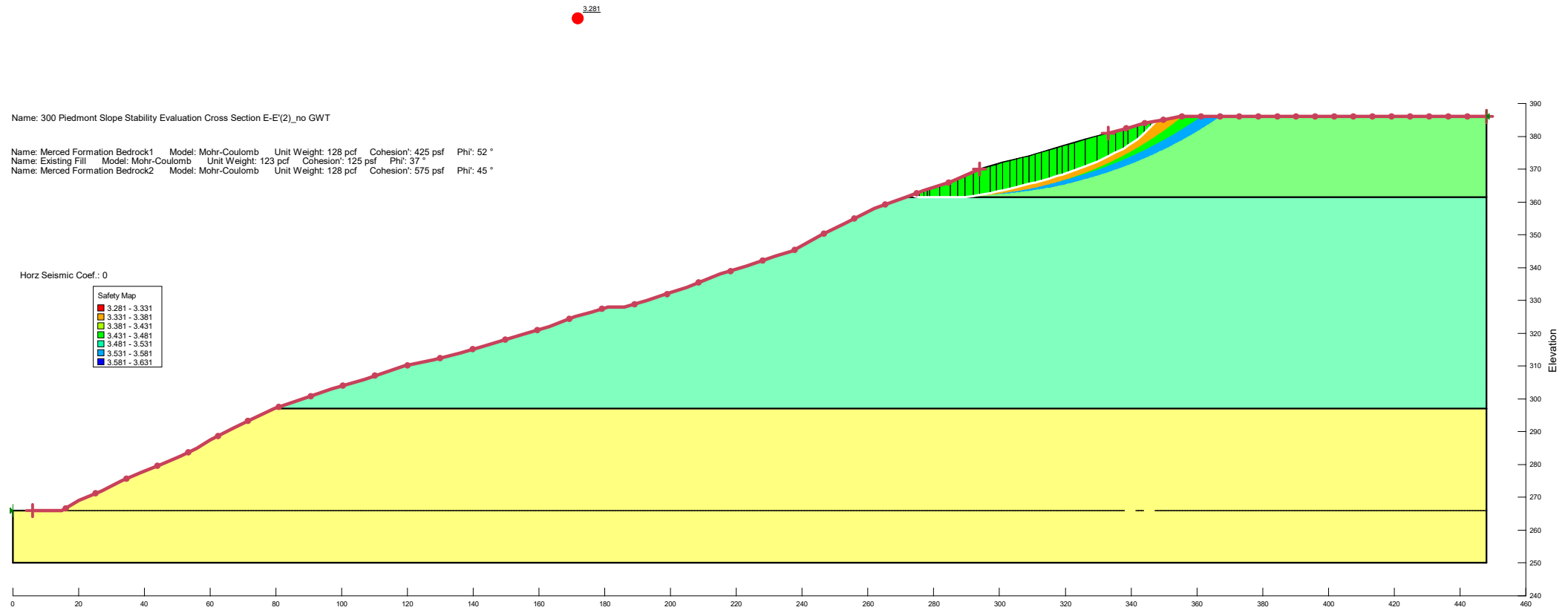

Name: 300 Piedmont Slope Stability Evaluation Cross Section D-D'(1)
Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
1
2
3
4
Elevation

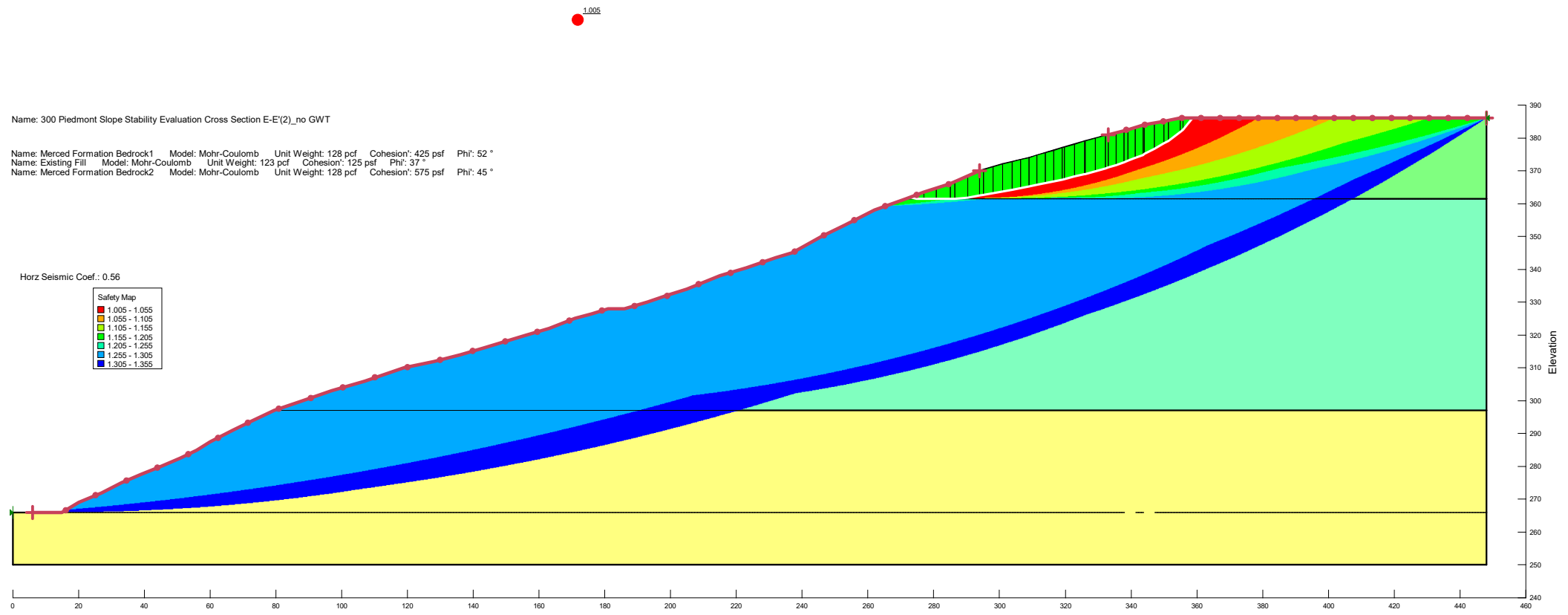

2.466
Name: 300 Piedmont Slope Stability Evaluation Cross Section D-D'(1)_no GWT
Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
Safety Map
2.466 - 2.516
2.516 - 2.566
2.566 - 2.616
2.616 - 2.666
2.666 - 2.716
2.716 - 2.766
2.766 - 2.816
Elevation
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390

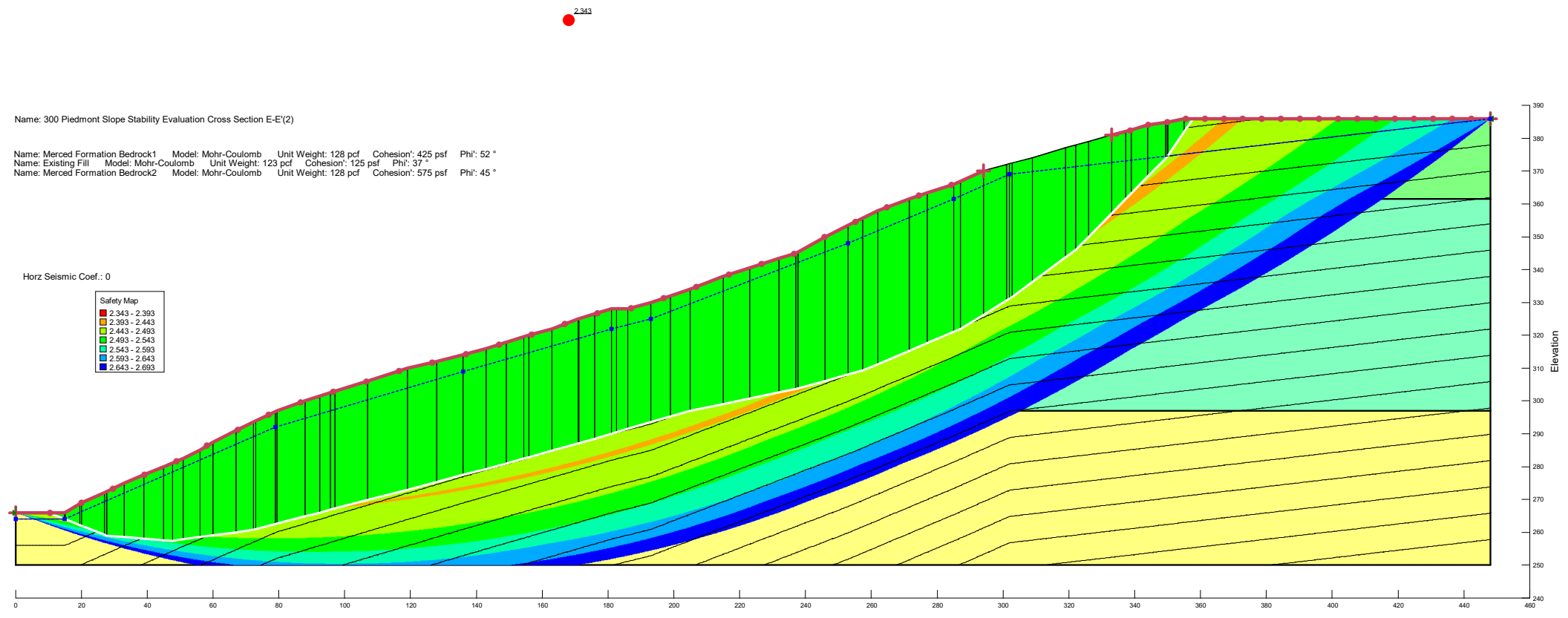

1.000
Name: 300 Piedmont Slope Stability Evaluation Cross Section D-D'(1)_no GWT
Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0.54
Safety Map
1.000 - 1.050
1.050 - 1.100
1.100 - 1.150
1.150 - 1.200
1.200 - 1.250
1.250 - 1.300
1.300 - 1.350
Elevation
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390


2.302
Name: 300 Piedmont Slope Stability Evaluation Cross Section D-D'(1)
Name: Merced Fordmation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
Safety Map
2.302 - 2.352
2.352 - 2.402
2.402 - 2.452
2.452 - 2.502
2.502 - 2.552
2.552 - 2.602
2.602 - 2.652
Elevation
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390


Name: 300 Piedmont Slope Stability Evaluation Cross Section E-E'(2)
Name: Merced Formation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Unidentifed Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
1
2
3
4
Elevation


3.281
Name: 300 Piedmont Slope Stability Evaluation Cross Section E-E'(2)_no GWT
Name: Merced Formation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
Safety Map
3.281 - 3.331
3.331 - 3.381
3.381 - 3.431
3.431 - 3.481
3.481 - 3.531
3.531 - 3.581
3.581 - 3.631
Elevation
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
0
20
40
60
80
100
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160
180
200
220
240
260
280
300
320
340
360
380
400
420
440
460

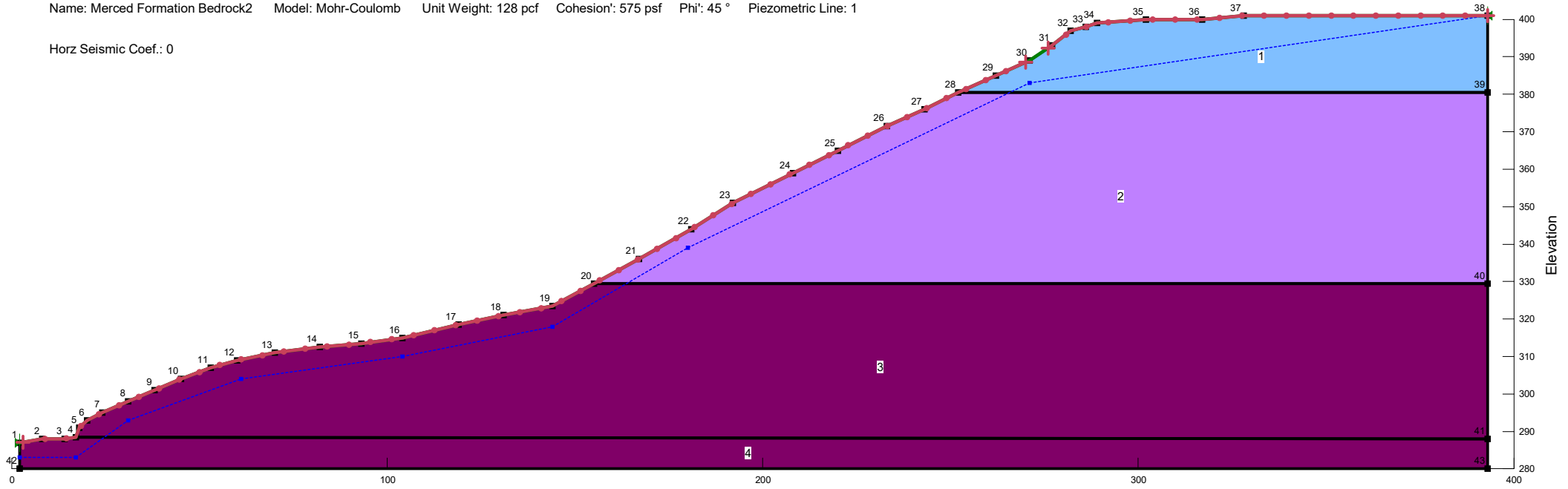

1.005
Name: 300 Piedmont Slope Stability Evaluation Cross Section E-E'(2)_no GWT
Name: Merced Formation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0.56
Safety Map
1.005 - 1.055
1.055 - 1.105
1.105 - 1.155
1.155 - 1.205
1.205 - 1.255
1.255 - 1.305
1.305 - 1.355
Elevation
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
0
20
40
60
80
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380
400
420
440
460

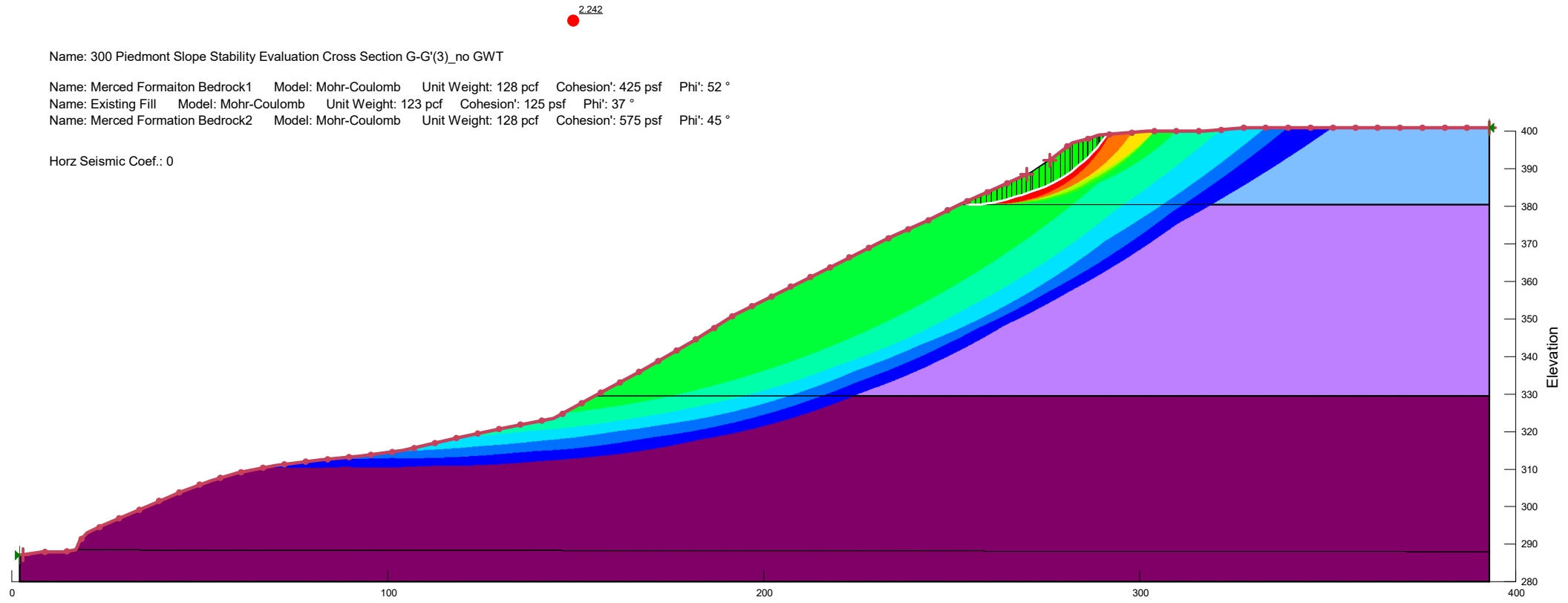

2.343
Name: 300 Piedmont Slope Stability Evaluation Cross Section E-E'(2)
Name: Merced Formation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
Safety Map
2.343 - 2.393
2.393 - 2.443
2.443 - 2.493
2.493 - 2.543
2.543 - 2.593
2.593 - 2.643
2.643 - 2.693
Elevation
390
380
370
360
350
340
330
320
310
300
290
280
270
260
250
240
0
20
40
60
80
100
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360
380
400
420
440
460

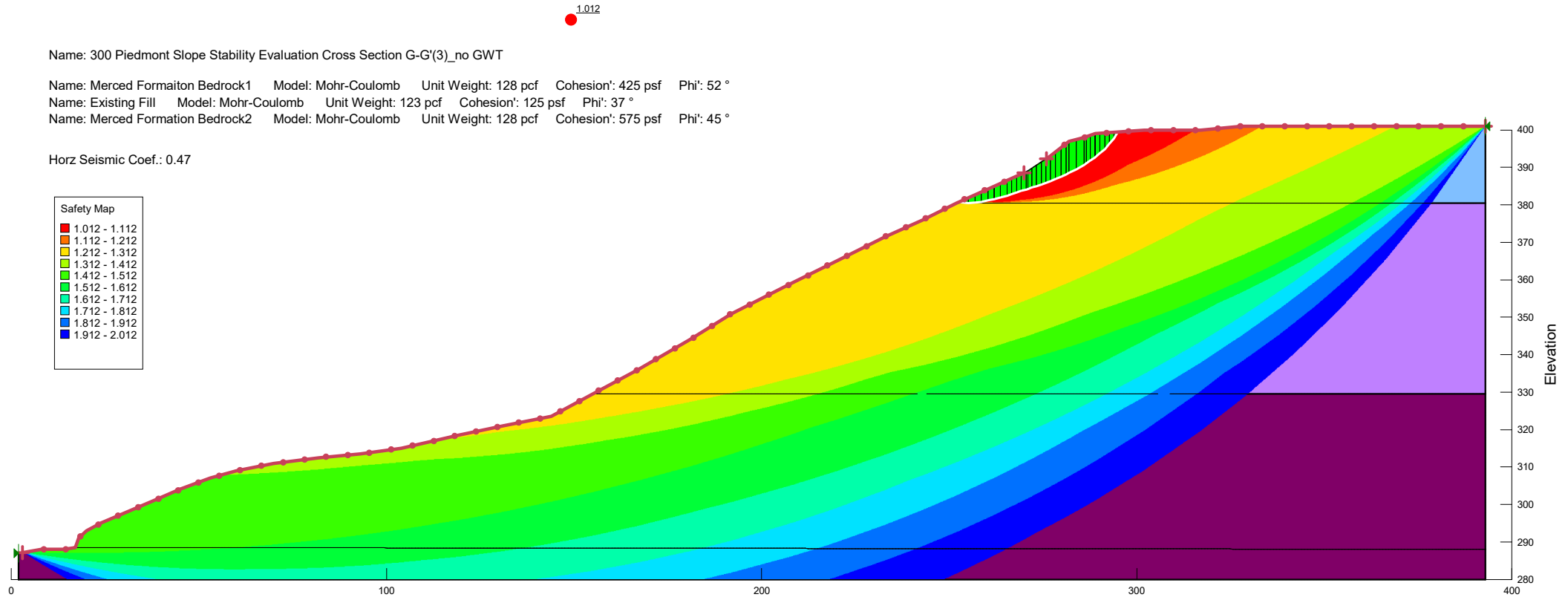
Name: 300 Piedmont Slope Stability Evaluation Cross Section G-G'(3)

Name: Merced Formaiton Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 ° Piezometric Line: 1
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 ° Piezometric Line: 1
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 ° Piezometric Line: 1

Horz Seismic Coef.: 0




2.242
Name: 300 Piedmont Slope Stability Evaluation Cross Section G-G'(3)_no GWT
Name: Merced Formaiton Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
400
390
380
370
360
350
340
330
320
310
300
290
280
Elevation
0
100
200
300
400

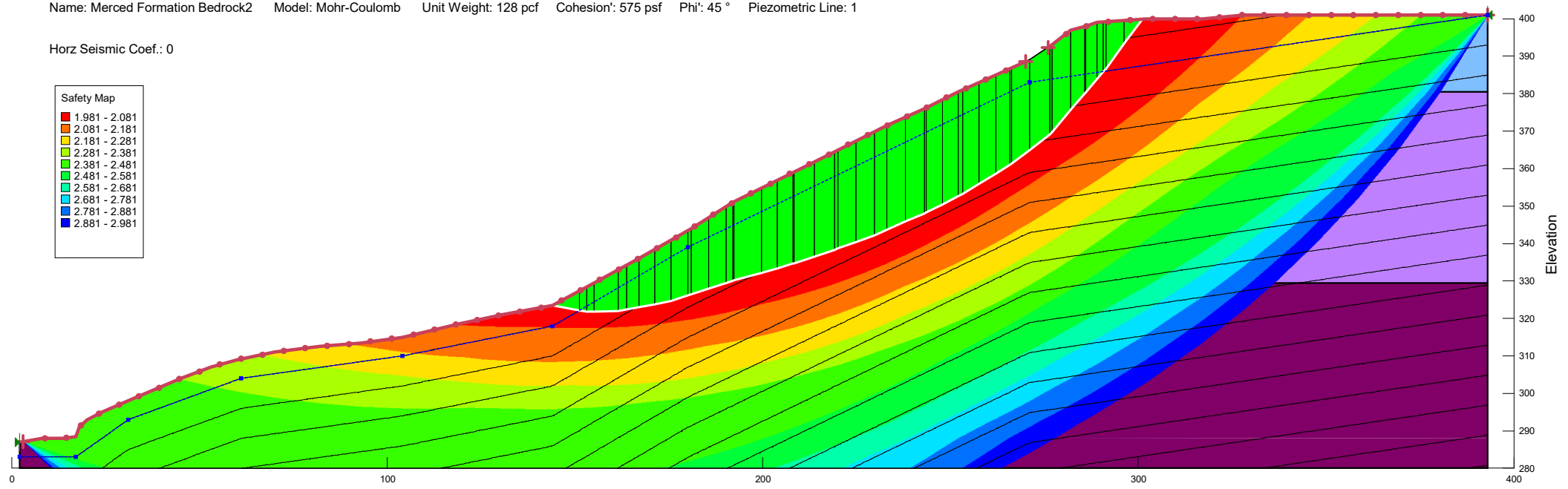

1.012
Name: 300 Piedmont Slope Stability Evaluation Cross Section G-G'(3)_no GWT
Name: Merced Formaiton Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0.47
Safety Map
1.012 - 1.112
1.112 - 1.212
1.212 - 1.312
1.312 - 1.412
1.412 - 1.512
1.512 - 1.612
1.612 - 1.712
1.712 - 1.812
1.812 - 1.912
1.912 - 2.012
0
100
200
300
400
280
290
300
310
320
330
340
350
360
370
380
390
400
Elevation

1.981

Name: 300 Piedmont Slope Stability Evaluation Cross Section G-G'(3)

Name: Merced Formaiton Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 ° Piezometric Line: 1
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 ° Piezometric Line: 1
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 ° Piezometric Line: 1

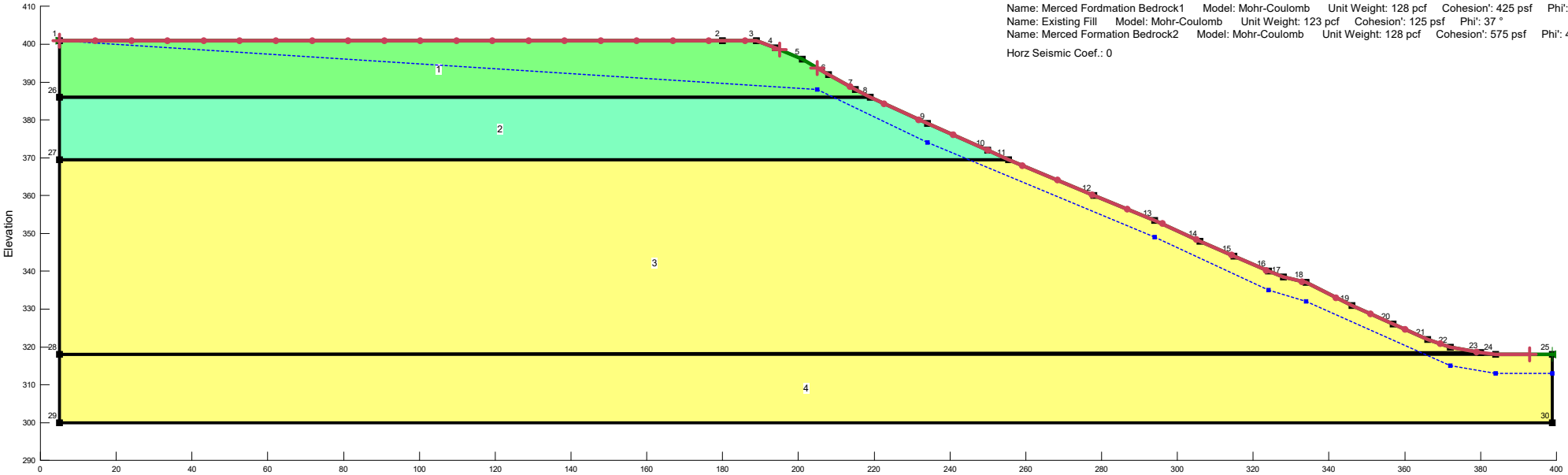
Horz Seismic Coef.: 0

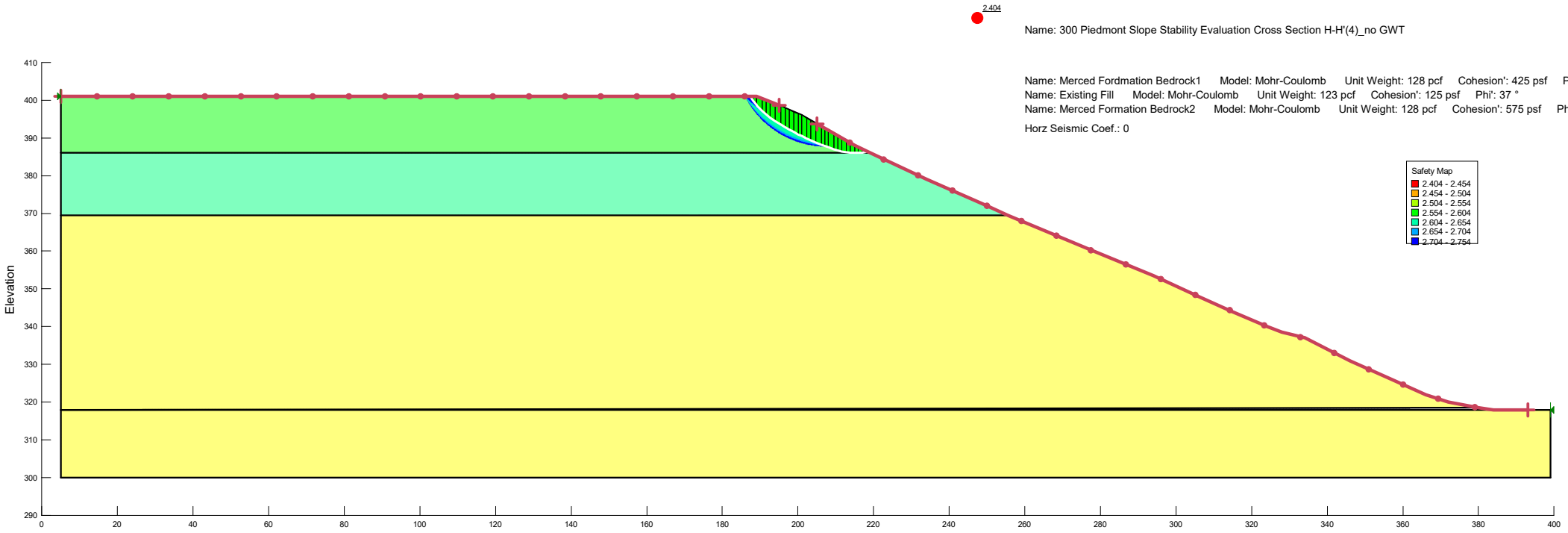


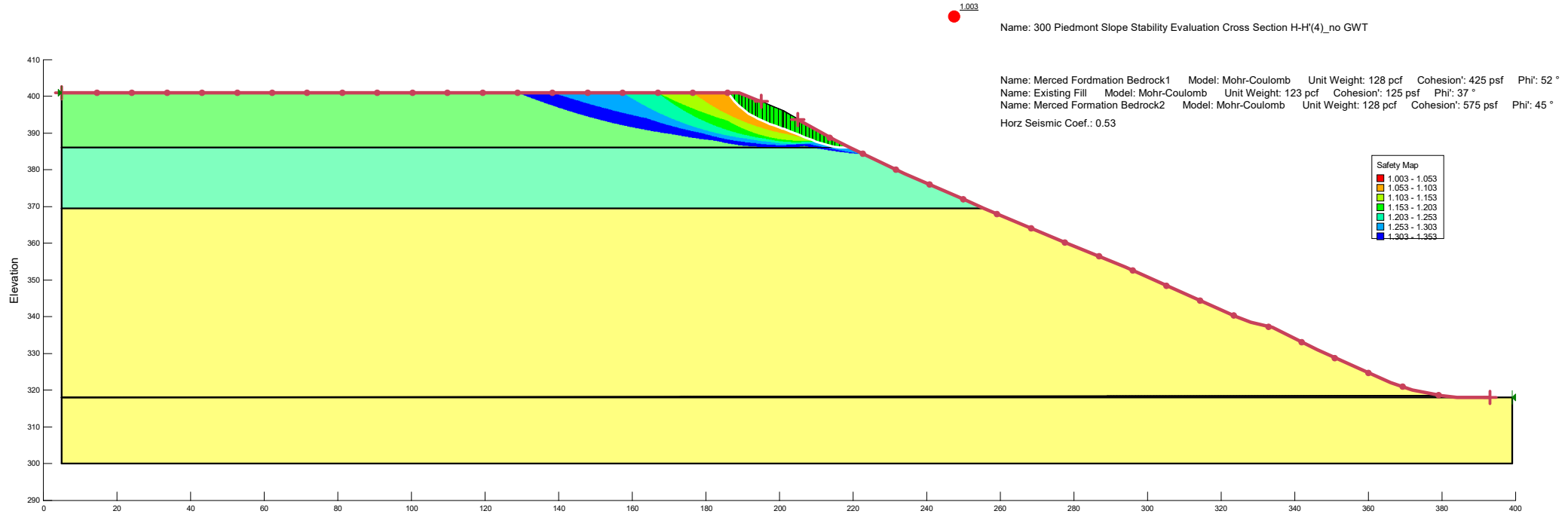
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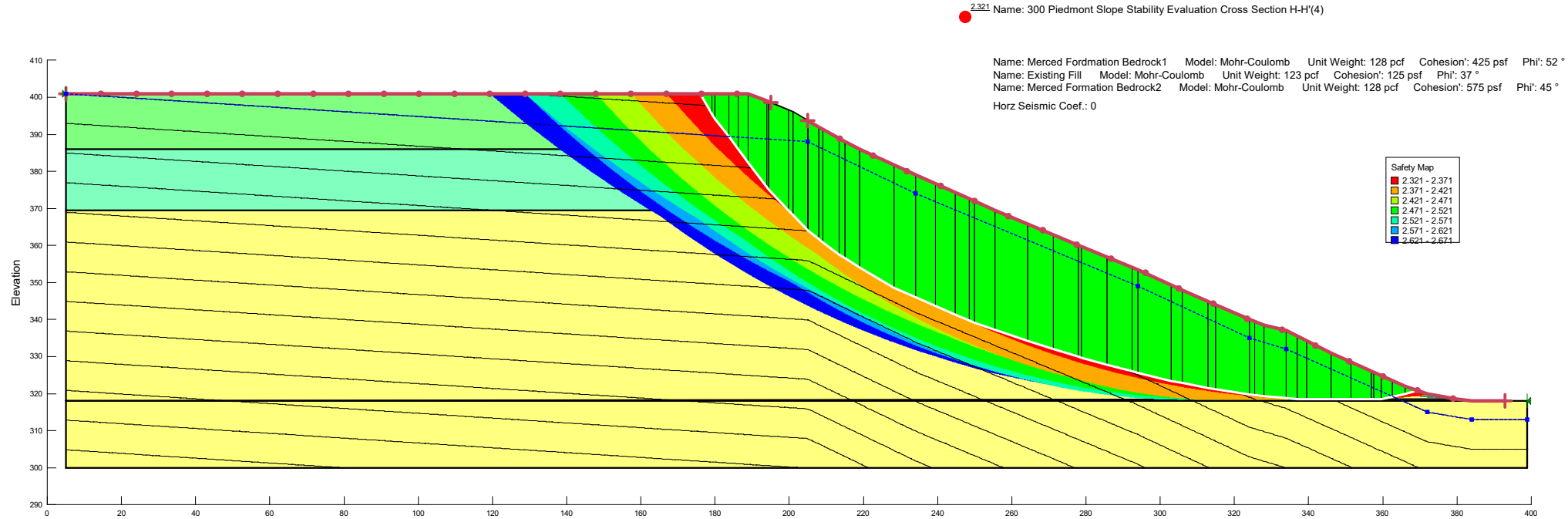
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Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °

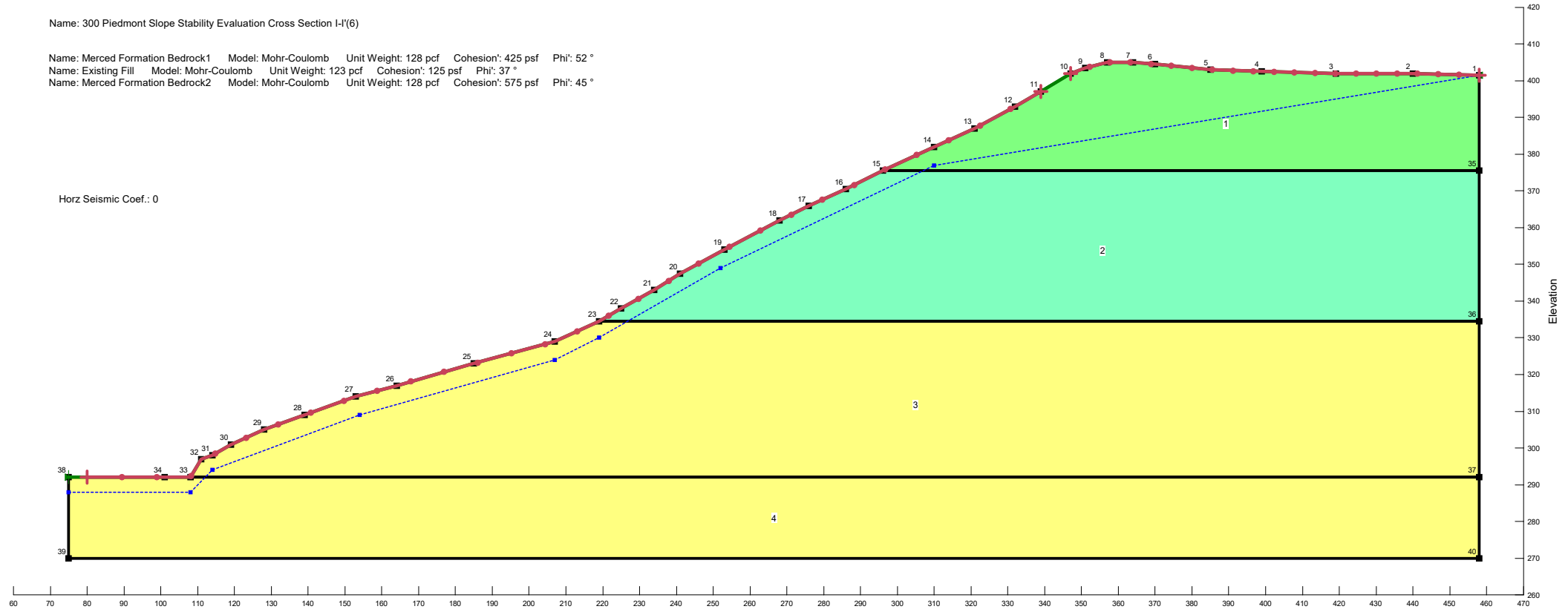
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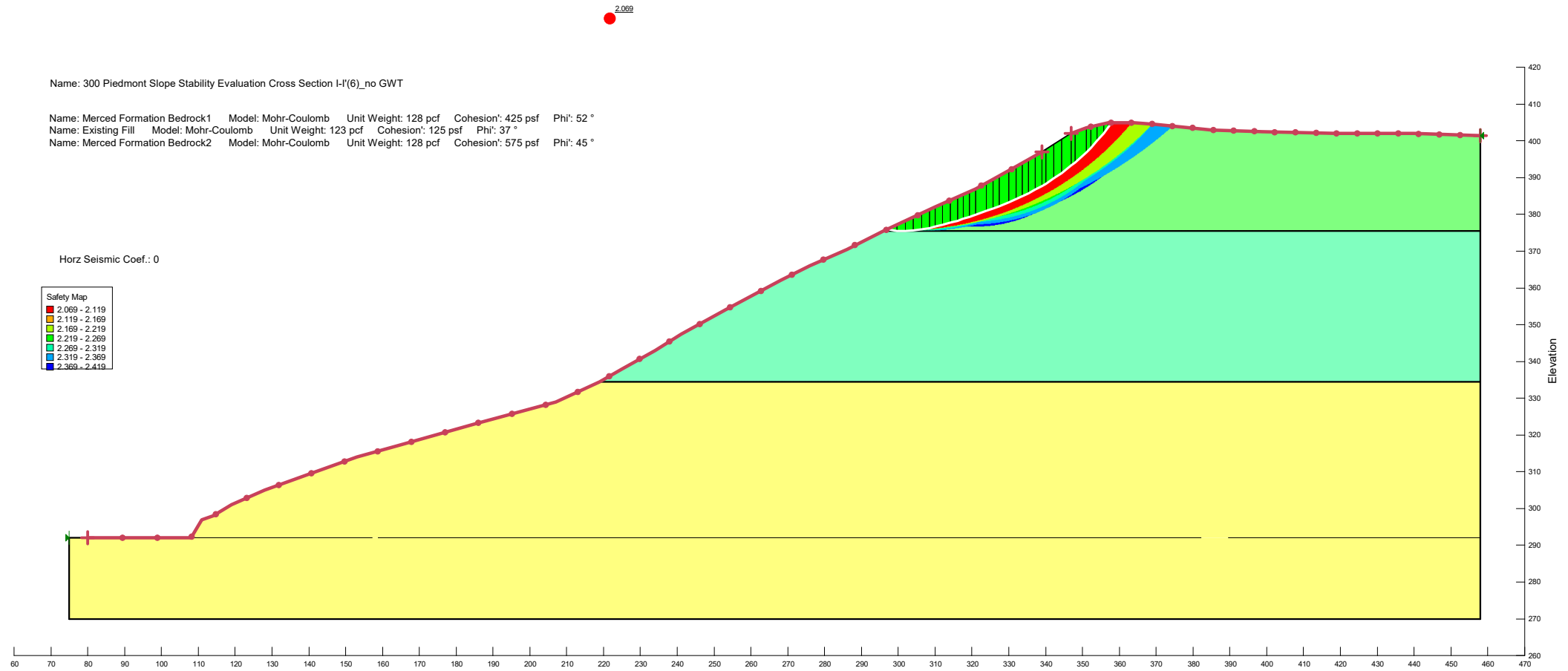


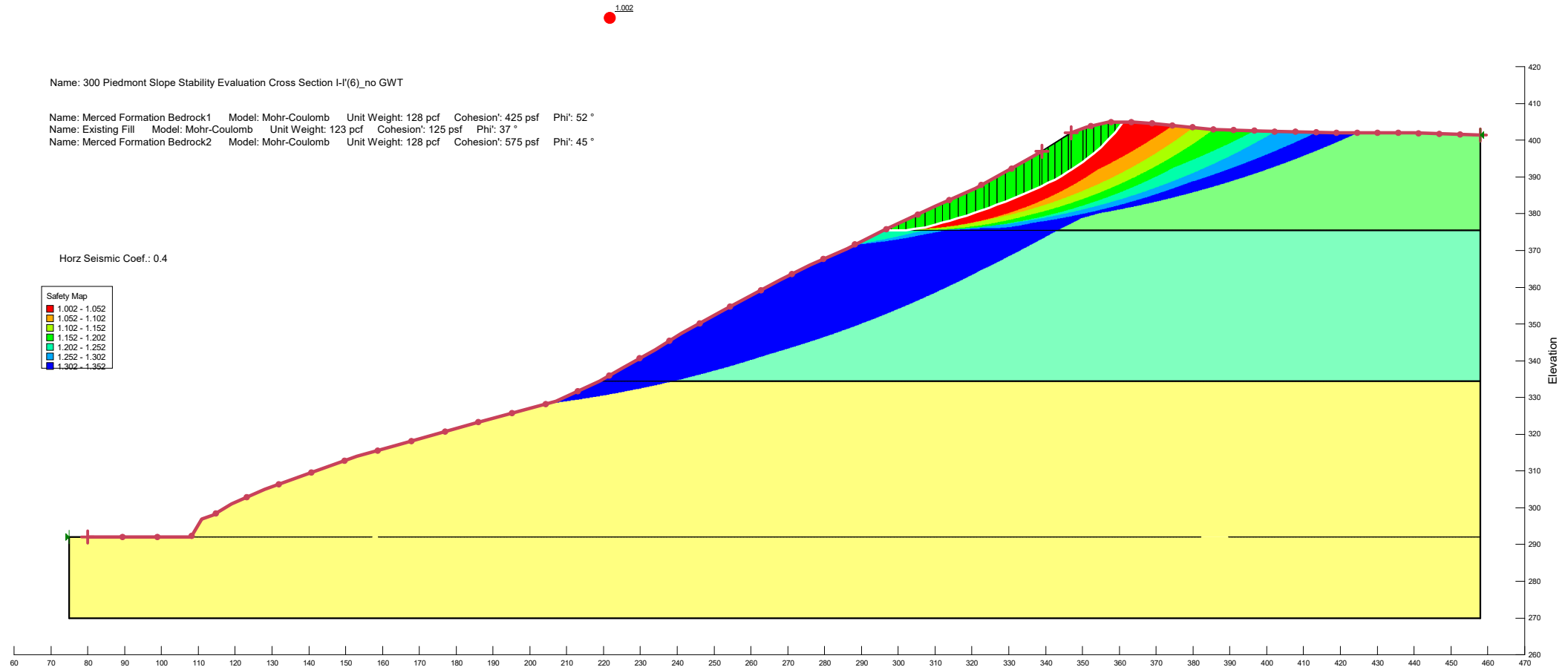

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Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf
Horz Seismic Coef.: 0
Safety Map
2.404 - 2.454
2.454 - 2.504
2.504 - 2.554
2.554 - 2.604
2.604 - 2.654
2.654 - 2.704
2.704 - 2.754
Elevation
410
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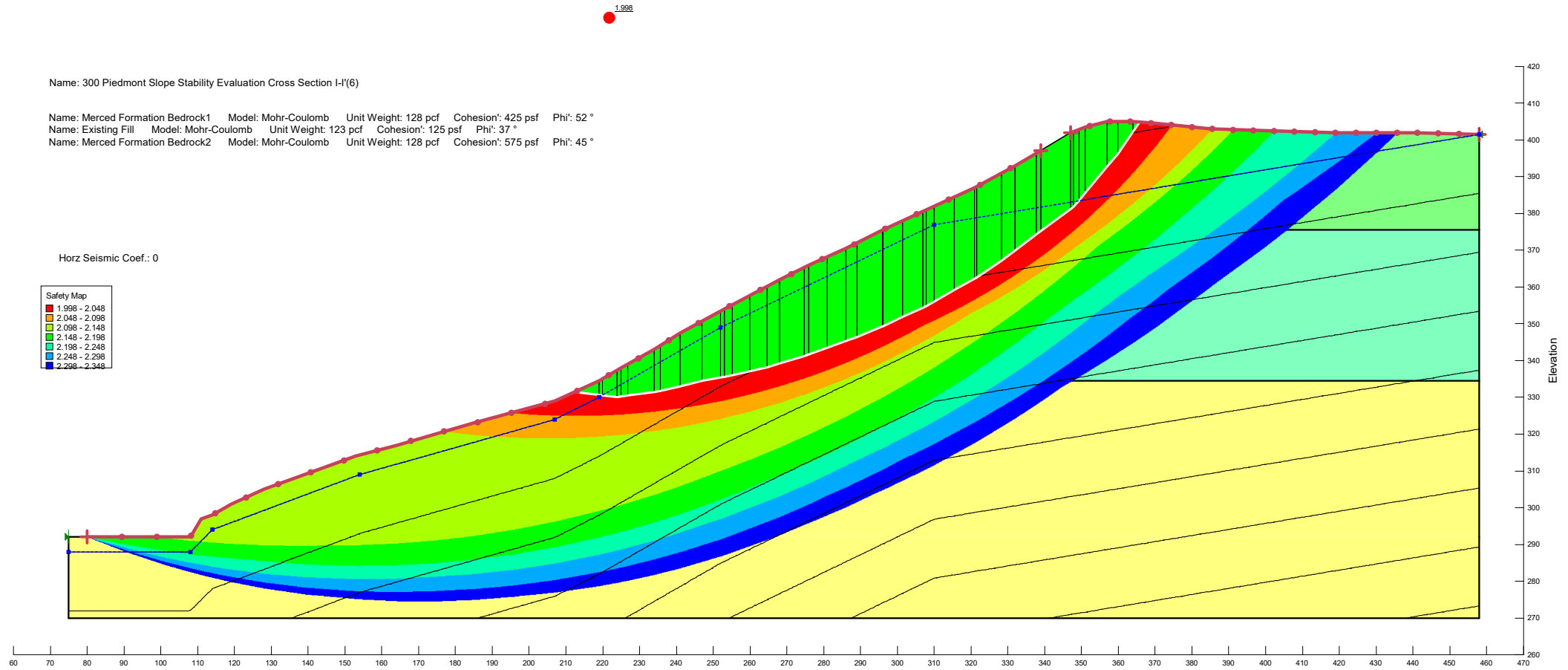

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Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0.53
Safety Map
1.003 - 1.053
1.053 - 1.103
1.103 - 1.153
1.153 - 1.203
1.203 - 1.253
1.253 - 1.303
1.303 - 1.353
Elevation
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2.321
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Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
Safety Map
2.321 - 2.371
2.371 - 2.421
2.421 - 2.471
2.471 - 2.521
2.521 - 2.571
2.571 - 2.621
2.621 - 2.671
Elevation
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Name: 300 Piedmont Slope Stability Evaluation Cross Section I-I'(6)
Name: Merced Formation Bedrock1 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 425 psf Phi': 52 °
Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
1
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3
4
Elevation


2.069
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Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
Safety Map
2.069 - 2.119
2.119 - 2.169
2.169 - 2.219
2.219 - 2.269
2.269 - 2.319
2.319 - 2.369
2.369 - 2.419
Elevation
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1.002
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Horz Seismic Coef.: 0.4
Safety Map
1.002 - 1.052
1.052 - 1.102
1.102 - 1.152
1.152 - 1.202
1.202 - 1.252
1.252 - 1.302
1.302 - 1.352
Elevation
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1.998
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Name: Existing Fill Model: Mohr-Coulomb Unit Weight: 123 pcf Cohesion': 125 psf Phi': 37 °
Name: Merced Formation Bedrock2 Model: Mohr-Coulomb Unit Weight: 128 pcf Cohesion': 575 psf Phi': 45 °
Horz Seismic Coef.: 0
Safety Map
1.998 - 2.048
2.048 - 2.098
2.098 - 2.148
2.148 - 2.198
2.198 - 2.248
2.248 - 2.298
2.298 - 2.348
Elevation
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Appendix F

Noise Technical Report

Noise and Vibration Impact Assessment

Crestmoor, 300 Piedmont Avenue Development

City of San Bruno, California

BAC Job # 2023-017

Prepared For:

ICF Jones & Stokes

Kristi Black
980 9th Street, Suite 1200
Sacramento, CA 95814

Prepared By:

Bollard Acoustical Consultants, Inc.

Paul Bollard, President

September 29, 2023

BOLLARD
Acoustical Consultants

Introduction

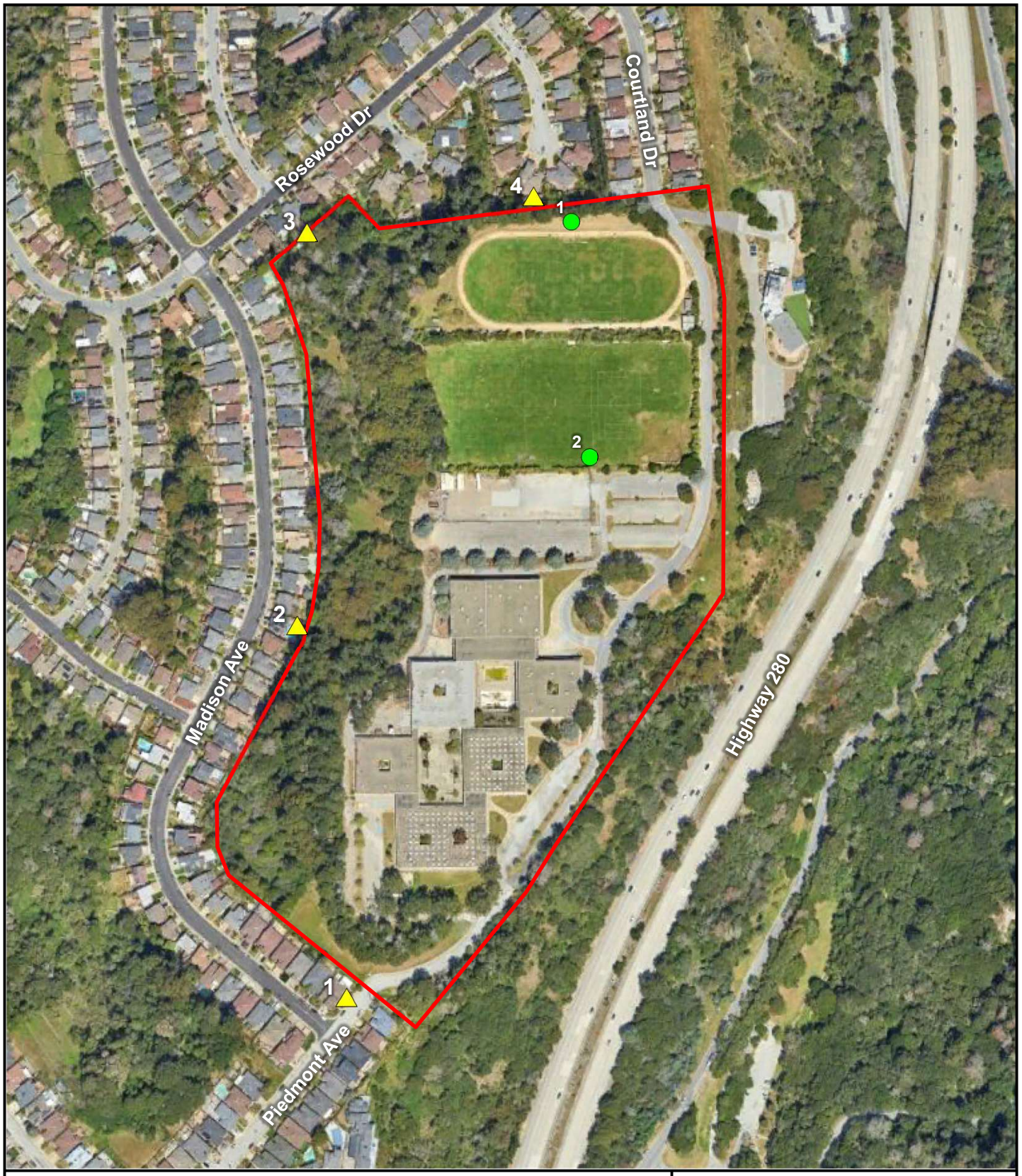
The Crestmoor, 300 Piedmont Avenue Project (project), consists of the development of residential, open space, and recreational uses on a 40.2 acre site located at 300 Piedmont Avenue, in the City of San Bruno, California.

The residential component would consist of development a new 155-lot single family detached home community with associated open space and infrastructure by SummerHill Homes. The recreational component of the project would consist of the City of San Bruno constructing new recreational amenities on the northern portion of the project site including a sports field with permanent nighttime lighting fixtures. As of the preparation of this noise and vibration analysis, the configuration of the playing fields has not been finalized. However, it is anticipated the field design would allow for a maximum of 6 soccer playing fields in use at any one time. Another option would include striping for two little league fields and five soccer fields, allowing for a maximum of two little league games or five soccer games to occur at one time. To accommodate the proposed development, the former Crestmoor High School and other existing structures on the project site would be demolished.

Figures 1 shows the project location and currently land uses in the immediate project vicinity. Figures 2 and 3 show the proposed residential configuration and conceptual playing field design, respectively. Although a minor variant to the site plan would is being considered that variant would not appreciably affect this noise and vibration impact assessment due to the fact that the variant would not locate project-related noise sources appreciably closer to existing residences than would occur under the proposed project. Figure 4 shows the site plans overlaid on aerial imagery.

Due to the potential noise generation of the project relative to adjacent residences, as well as the sensitivity of the proposed residential uses within the project site, Bollard Acoustical Consultants, Inc. (BAC) was retained by ICF Jones & Stokes, Inc. to prepare this noise and vibration impact assessment. This assessment is intended to provide the foundation of the Draft Environmental Impact Report (DEIR) Noise and Vibration Section.

The purposes of this assessment are to quantify the existing noise and vibration environments, identify potential noise and vibration impacts resulting from the project, and to identify appropriate mitigation measures where impacts are identified. This assessment focuses on the quantification of off-site traffic noise increases resulting from the project, noise generated by activities at the future sports fields, project-generated construction noise and vibration levels, and City of San Bruno General Plan consistency as it relates to the sensitivity of the proposed residential development component of the project.



Legend

- Project Boundary (Approximate)
- Long-Term Noise Measurement Locations
- Short-Term Soccer Game Noise Monitoring Locations

N

Scale (Feet)

0 100 200

Project Location & Noise Measurement Sites

300 Piedmont Ave Dev.
San Bruno, California

Figure 1

BOLLARD Acoustical Consultants



Legend

N

Scale (Feet)

0 500 1,000

Proposed Project Site Plan

300 Piedmont Ave Development
San Bruno, California

Figure 2

BOLLARD
Acoustical Consultants



Legend

N

Scale (Feet)

0 40 80

Conceptual Field Design

300 Piedmont Ave Dev.
San Bruno, California

Figure 3

BOLLARD Acoustical Consultants



Legend

Project Boundary (Approximate)

N

Scale (Feet)

0 100 200

Project Site Layout

300 Piedmont Ave Dev.
San Bruno, California

Figure 4

BOLLARD Acoustical Consultants

Noise and Vibration Fundamentals

Noise

Noise is commonly defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, an evaluation of noise is necessary when considering the environmental impacts of a proposed project.

Sound is mechanical energy (vibration) transmitted by pressure waves over a medium such as air or water. Sound is characterized by various parameters, including the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor for characterizing the loudness of an ambient (existing) sound level. Although the decibel (dB) scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called A-weighting, written as dBA and referred to as A-weighted decibels. Appendix A defines terminology used in this report. Figure 5 provides examples of decibel levels for common noise sources.

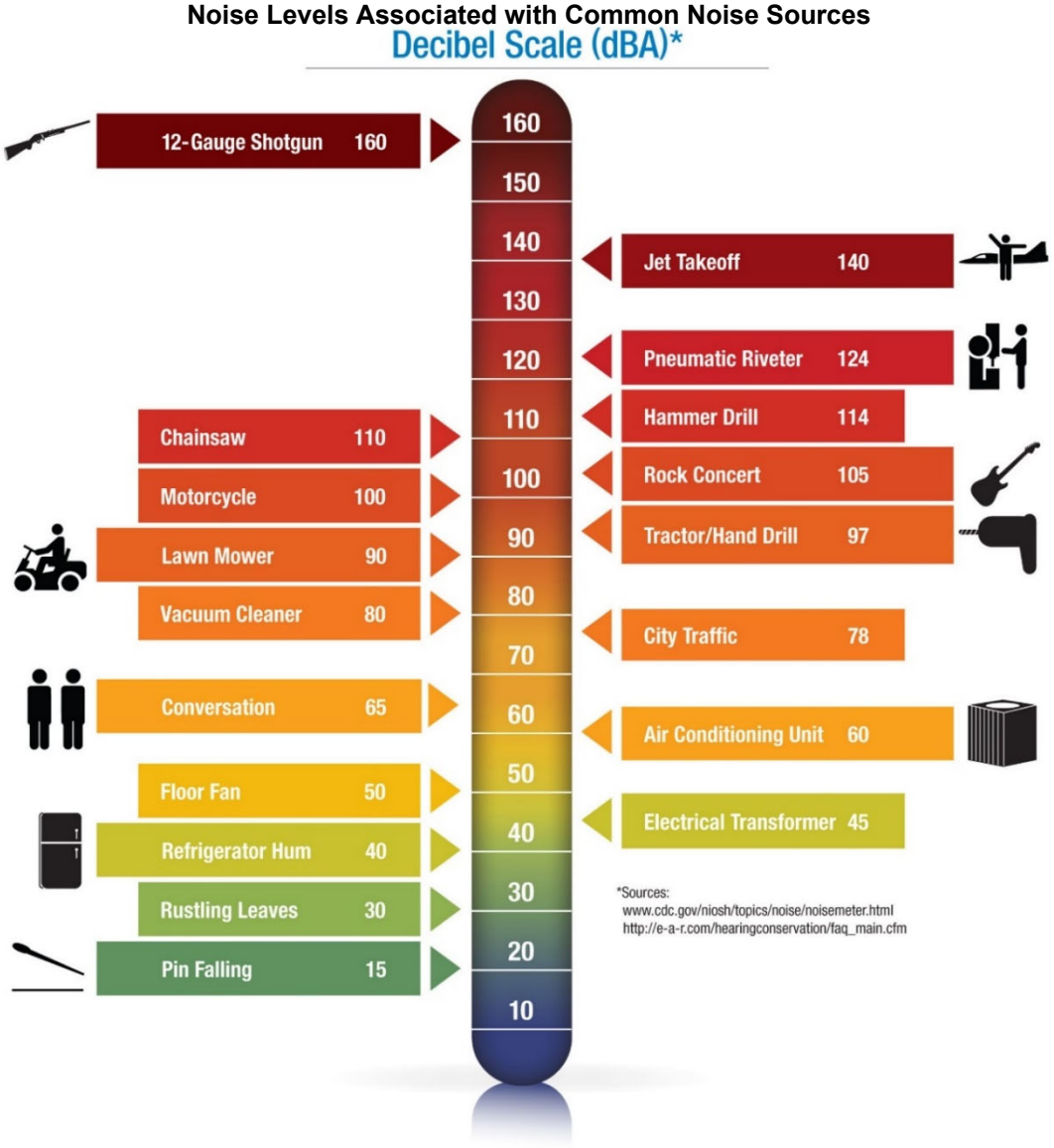
In general, human sound perception is such that a change in sound level of 1 dB cannot typically be perceived by the human ear, a change of 3 dB is barely noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level as it increases or decreases, respectively (Egan, Architectural Acoustics, McGraw Hill, 1988).

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (Leq), the minimum and maximum sound levels (Lmin and Lmax), percentile-exceeded sound levels (such as L10, L20), the day-night sound level (Ldn), and the community noise equivalent level (CNEL). Ldn and CNEL values differ by less than 1 dB. As a matter of practice, Ldn and CNEL values are considered to be equivalent and are treated as such. These measurements are defined in Table 3.7-1.

For a point source, such as a stationary compressor or a piece of construction equipment, sound attenuates (lessens in intensity), based on geometry, at a rate of 6 dB per doubling of distance. For a line source, such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance perpendicular to the source (California Department of Transportation 2013). Atmospheric conditions, including wind, temperature gradients, and humidity, can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate than sound that travels over a hard surface such as pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers such as buildings or topographic features that block the line of sight between a source and receiver also increase the attenuation of sound over distance.

Community noise environments are generally perceived as quiet when the 24-hour average noise level is below 45 dBA, moderate in the 45 to 60 dBA CNEL range, and loud above 60 dBA CNEL. Very noisy urban residential areas are usually around 70 dBA CNEL. Along major thoroughfares, roadside noise levels are typically between 65 and 75 dBA CNEL. Incremental changes of 3 to 5 dB in the existing 1-hour Leq, or the CNEL, are commonly used as thresholds for an adverse community reaction to a noise increase. However, there is evidence that incremental thresholds in this range may not be sufficiently protective in areas where noise-sensitive uses are located and CNEL is already high (i.e., above 60 dBA). In these areas, limiting noise increases to 3 dB or less is recommended (Federal Transit Administration 2018). Noise intrusions that cause short-term interior noise levels to rise above 45 dBA at night can disrupt sleep. Exposure to noise levels greater than 85 dBA for 8 hours or longer can cause permanent hearing damage.

Figure 5
Noise Levels Associated with Common Noise Sources



Vibration

Operation of heavy construction equipment, particularly pile-driving equipment and other impact devices (e.g., pavement breakers), creates seismic waves that radiate along the surface of and downward into the ground. These surface waves can be felt as ground vibration. Vibration from the operation of this type of equipment can result in effects that range from annoyance for people to damage for structures. Variations in geology and distance result in different vibration levels, including different frequencies and displacements. In all cases, vibration amplitudes decrease with increased distance.

Perceptible ground-borne vibration is generally limited to areas within a few hundred feet of construction activities. As seismic waves travel outward from a vibration source, they cause rock and soil particles to oscillate. The actual distance that these particles move is usually only a few ten-thousandths to a few thousandths of an inch. The rate or velocity (in inches per second) at which these particles move is the commonly accepted descriptor of vibration amplitude, referred to as peak particle velocity (PPV).

Vibration amplitude attenuates over distance. This is a complex function of how energy is imparted into the ground and the soil or rock conditions through which the vibration is traveling. For typical construction equipment (i.e. augers, bulldozers, trucks, jackhammers, etc), reference PPV levels at 25 feet typically range from approximately 0.035 to 0.089 inches/second.

Criteria for Acceptable Noise Exposure

Federal, state, and local agencies regulate different aspects of environmental noise. Generally, the federal government sets noise standards for transportation-related noise sources that are closely linked to interstate commerce. These sources include aircraft, locomotives, and trucks. No federal noise standards are directly applicable to the Project. The state government sets noise standards for transportation noise sources such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies. Local general plans identify general principles that are intended to guide and influence development plans. The state and local noise policies and regulations that are applicable to the Project are described below.

City of San Bruno General Plan

Chapter 7 of the City of San Bruno General Plan (Health and Safety Element) contains the City's noise policies. The General Plan noise standards are shown in Table 3 (General Plan Table 7-2). Those policies that would be pertinent to this project are reproduced below:

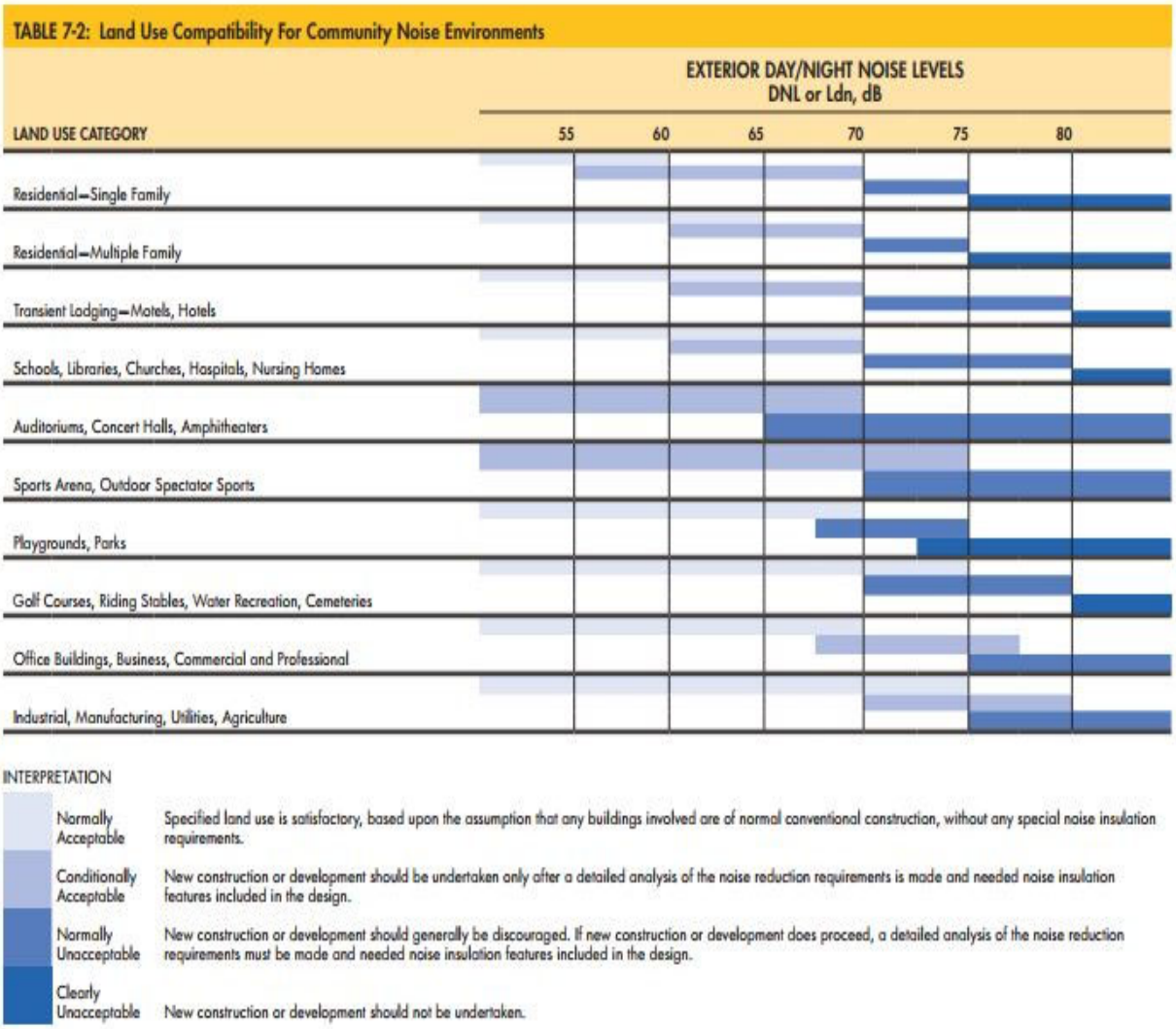
HS-32 Encourage developers to mitigate ambient noise levels adjacent to major noise sources by incorporating acoustical site planning into their projects. Utilize the City's Building Code to implement mitigation measures, such as:

- Incorporating buffers and/or landscaped berms along high-noise roadways or railways;

- Incorporating traffic calming measures and alternative intersection design within and/or adjacent to the project;
- Using reduced-noise pavement (rubberized asphalt); and
- Incorporating state-of-the-art structural sound attenuation measures.

HS-33 Prevent the placement of new noise-sensitive uses unless adequate mitigation is provided. Establish insulation requirements as mitigation measures for all development, per the standards in Table 1.

Table 1
Land Use Compatibility for Community Noise Environments
San Bruno General Plan Health and Safety Element (Table 7-2)



HS-34 Discourage noise-sensitive uses such as hospitals, schools, and rest homes from locating in areas with high noise levels. Conversely, discourage new uses likely to produce high levels of noise from locating in areas where noise-sensitive uses would be impacted.

HS-36 Encourage developers of new residential projects to provide noise buffers other than sound walls, such as vegetation, storage areas, or parking, as well as site planning and locating bedrooms away from noise sources.

HS-38 Require developers to mitigate noise exposure to sensitive receptors from construction activities. Mitigation may include a combination of techniques that reduce noise generated at the source, increase the noise insulation at the receptor, or increase the noise attenuation rate as noise travels from the source to the receptor.

As indicated in Table 1, new single-family residential uses are considered compatible in exterior noise environments up to 60 dBA DNL. The California Code of Regulations (Title 24) establishes an interior noise level standard of 45 dB L_{dn}/CNEL for any habitable room. This is the interior noise level standard applicable to the residential component of the project.

San Bruno Municipal Code

The San Bruno Municipal Code contains regulations directly pertaining to noise in Section 6.16 (i.e., the Noise Ordinance). This section discusses noise limits for various noise sources in the jurisdiction. The relevant guidelines from the City Noise Ordinance are included below.

> ***6.16.030 Ambient Noise Level Limits.***
> Where the ambient noise level is less than designated in this section, the respective noise level in this section shall govern (Sound Level A, decibels): Residential zone, time ten p.m. to seven a.m., forty-five decibels; seven a.m. to ten p.m., sixty decibels.
>
> ***6.16.050 Noise Levels Exceeding Ambient Base Level.***
> Any noise level exceeding the zone ambient base level at the property plane of any property, or exceeding the zone ambient base level on any adjacent residential area zone line or at any place of other property (or, if a condominium or apartment house, within any adjoining apartment) by more than ten decibels shall be deemed to be prima facie evidence of a violation of the provisions of this chapter. However, during the period of seven a.m. to ten p.m. the ambient base level may be exceeded by twenty decibels for a period not to exceed thirty minutes during any twenty-four hour period.
>
> ***6.16.060 Machinery Noise Levels.***
> No person shall operate any machinery, equipment, pump, fan, air conditioning apparatus or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property plane of any property to exceed the ambient base noise level by more than ten decibels. However, during the period of seven a.m. to ten p.m. the ambient noise level may be exceeded by twenty decibels for a period not to exceed thirty minutes during any twenty-four hour period.

6.16.070 Construction of Buildings and Projects.

No person shall, within any residential zone, or within a radius of 500 feet therefrom, operate equipment or perform any outside construction or repair work on any building, structure, or other project, or operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction-type device which shall exceed, between the hours of seven a.m. and ten p.m., a noise level of 85 decibels as measured at one hundred feet, or exceed between the hours of ten p.m. and seven a.m. a noise level of 60 decibels as measured at one hundred feet, unless such person shall have first obtained a permit therefor from the director of public works. No permit shall be required to perform emergency work.

6.16.080 Public Areas.

A. No source of sound, including, but not limited to, amplifiers and other musical devices, shall exceed seventy decibels at a distance of fifty feet from the source of the sound between the hours of eleven a.m. and four p.m. unless a permit shall first have been obtained from the city council.

B. No source of sound, including, but not limited to, amplifiers and other musical devices, shall exceed sixty decibels at a distance of fifty feet from the source of the sound between the hours of four p.m. and eleven a.m. unless a permit shall first have been obtained from the city council.

6.16.160 Amplified Sound—Regulations.

The commercial and noncommercial use of sound-amplifying equipment shall be subject to the following regulations:

a) The only sounds permitted shall be either music or human speech, or both.

b) The operation of sound-amplifying equipment shall only occur between the hours of eight a.m. and eight p.m. each day except on Sundays and legal holidays. No operation of sound amplifying equipment for commercial purposes shall be permitted on Sundays or legal holidays. The operation of sound-amplifying equipment for noncommercial purposes on Sundays and legal holidays shall occur only between the hours of ten a.m. and eight p.m.

c) Sound level emanating from sound-amplifying equipment shall not exceed fifteen decibels above the ambient base noise level, as measured at a distance of one hundred feet from the sound source.

d) Notwithstanding the provisions of subsection C, sound-amplifying equipment shall not be operated within two hundred feet of churches, schools, hospitals or city or county buildings.

San Francisco International Airport Land Use Compatibility Plan

The Airport Land Use Compatibility Plan (ALUCP) for SFO as adopted in 2023 as the Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport. The SFO ALUCP was developed to align with the guidance provided by the U.S. Department of Transportation, Division of Aeronautics, and the Federal Aviation Administration. Its purpose is to establish planning boundaries around SFO that define noise for policy implementation and require notification of SFO proximity in real estate transactions (City/County Association of Governments of San Mateo County 2012). Airport and aircraft operations' noise is a significant concern for airport land use commissions, particularly in densely populated regions like the Bay Area.

The SFO ALUCP includes policies and standards to protect people living in the vicinity of SFO from the effects of aircraft noise (City/County Association of Governments of San Mateo County 2012). Policy NP-2, Airport/Land Use Compatibility Criteria, establishes criteria to determine the compatibility of proposed land uses in the Airport Noise Compatibility Zones. For new detached single-family residential uses, the ALUCP establishes aircraft noise levels of 65 CNEL as being acceptable without restrictions.

Criteria for Acceptable Vibration Exposure

The California Department of Transportation (Caltrans) criteria applicable to damage and annoyance from transient and continuous vibration typically associated with construction activities are presented in Tables 2 and 3. Equipment or activities typical of continuous vibration include: excavation equipment, static compaction equipment, tracked vehicles, traffic on a highway, vibratory pile drivers, pile-extraction equipment, and vibratory compaction equipment. Equipment or activities typical of single-impact (transient) or low-rate repeated impact vibration include impact pile drivers, blasting, drop balls, "pogo stick" compactors, and crack-and-seat equipment (California Department of Transportation 2013).

Table 2
Guideline Vibration Damage Potential Threshold Criteria

	Maximum PPV [inches/second]	
Structure and Condition	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = Peak Particle Velocity

Source: Caltrans Transportation and Construction Vibration Guidance Manual (2013).

Table 3
Guideline Vibration Annoyance Potential Criteria

	Maximum PPV [inches/second]	
Human Response	**Transient Sources**	**Continuous/Frequent Intermittent Sources**
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.90	0.10
Severe	2.00	0.40

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = Peak Particle Velocity

Source: Caltrans Transportation and Construction Vibration Guidance Manual (2013).

Pursuant to the information contained within Tables 2 and 3, a vibration criterion of 0.25 ips is conservatively applied to this evaluation to protect against damage to older structures and annoyance.

Existing Noise Environment in Project Vicinity

General Ambient Noise Environment

The existing ambient noise environment in the vicinity of the project Site is defined primarily by local traffic and, to a lesser extent, by existing playing field activities at the northern end of the project site and aircraft overflights associated with SFO operations. Because Highway 280 is depressed approximately 100 feet relative to the project site and completely shielded from view of the project site by extensive intervening topography, noise from Highway 280 does not appreciably affect the project site.

To quantify existing ambient noise levels at and around the Project Site, long-term (24-hour) ambient noise measurements were conducted at four residential locations surrounding the project site from Saturday, April 15th through Monday, April 17th, 2023, a period of 72 consecutive hours at each location. Because playing field activities at the project site are most intensive during weekend periods, the long-term ambient noise survey was specifically conducted to include a complete weekend period.

The long-term noise measurement locations are shown on Figure 1. Larson Davis Laboratories (LDL) Model 820, LxT and 831 precision integrating sound level meters were used to complete the noise level measurement surveys. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4). Photographs of the long-term noise survey locations are provided in Appendix B-1.

Table 4 contains a summary of the long-term noise survey results. A complete listing of the long-term ambient survey results is provided in tabular and graphical formats in Appendices C and D, respectively. The Table 4 data indicate that measured daytime maximum and average noise levels in the project vicinity were typically in the 60's and low 50's dBA, respectively, with DNL values ranging from 50-60 dBA.

Existing Playing Field Noise Environment

In addition to the long-term ambient noise survey, short-term noise level measurements were conducted at two locations on the project site on the morning of Saturday, April 15th, 2023. Figure 1 shows the short-term noise measurement locations. These measurements were specifically conducted to quantify the noise generation of soccer games occurring at the project site and the microphones were approximately 75 feet from the edge of the soccer field at both locations. The 75-foot distance was selected as it represents the distance from the nearest spectator location on the northern soccer field to the nearest existing residential property line to the north.

A Larson Davis Laboratories (LDL) Model 831 precision integrating sound level meter was used to complete the short-term noise level measurement surveys. The meter was calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. Photographs of the short-term noise survey locations are provided in Appendix B-2. A summary of the short-term noise survey results is provided in Table 5.

Table 4
Baseline Ambient Noise Survey Results
Crestmoor, Piedmont 300 Development Project Vicinity – San Bruno, California
April 15-17, 2023

			Daytime (7 am – 10 pm)			Nighttime (10 pm – 7 am)			
Site[1]	Address	Date	Lmax	Leq	L50	Lmax	Leq	L50	DNL
1	100 Madison Ave	4/15/2023	65	48	46	57	42	37	50
		4/16/2023	66	49	46	59	42	38	50
		4/17/2023	69	54	48	58	45	40	55
		Average	67	51	47	58	43	38	52
2	210 Madison Ave	4/15/2023	63	50	48	56	42	38	51
		4/16/2023	67	53	48	57	44	40	53
		4/17/2023	63	49	46	57	45	41	52
		Average	65	51	47	57	43	40	52
3	2263 Rosewood Dr	4/15/2023	62	49	46	56	41	37	50
		4/16/2023	64	50	47	57	44	39	52
		4/17/2023	67	61[2]	48	59	45	41	60
		Average	65	53	47	57	43	39	54
4	181 Glenbrook Ln	4/15/2023	60	49	48	56	43	39	51
		4/16/2023	61	49	48	57	46	41	53
		4/17/2023	61	49	47	57	45	42	52
		Average	61	49	47	57	45	41	52

1. Noise measurement site locations are illustrated on Figure 5.
2. This measured daytime average noise level is considered to be anomalous as it appears to have been unduly affected by local residential yard maintenance activities.

Source: BAC 2023

Table 5
Short-Term Ambient Noise Survey Results
Crestmoor, Piedmont 300 Development Project Vicinity – San Bruno, California
Saturday, April 15, 2023

		Measured Sound Levels, dBA		
Site[1]	**Time**	**Lmax**	**Leq**	**L50**
1	9:22 AM	63	54	53
	9:25 AM	69	55	54
	9:30 AM	69	56	55
	9:35 AM	70	57	54
	9:40 AM	65	56	55
	9:45 AM	65	55	54
	9:50 AM	68	56	54
	9:55 AM	68	56	54
	10:00 AM	69	56	53
	10:05 AM	70	56	53
	10:10 AM	69	57	55
	10:15 AM	66	55	54
	10:20 AM	55	50	49
	10:25 AM	59	52	51
	10:30 AM	56	53	53
	Average	**65**	**55**	**53**
2	10:36 AM	67	54	52
	10:40 AM	75	60	55
	10:45 AM	75	62	57
	10:50 AM	74	61	58
	10:55 AM	73	64	61
	11:00 AM	73	61	58
	11:05 AM	75	64	61
	11:10 AM	66	58	56
	Average	**72**	**61**	**57**

1. Noise measurement site locations are illustrated on Figure 5. Each location was approximately 75 feet from the edge of the soccer field.
2. Because the soccer game occurring nearest to Site 2 was underway at the time the soccer game at Site 1 was completed and the noise monitor relocated, the duration of time monitored at site 2 was shorter than that for Site 1.

Source: BAC 2023

The Table 5 data indicates that maximum noise levels measured during the soccer games ranged from 55 to 70 dBA at the measurement distance of 75 feet. Measured average noise levels ranged from 50 to 57 dBA Leq during the soccer game noise surveys. Inspection of Appendix D-10 indicates that, during the 9 and 10 am hours of Saturday April 15th when soccer games were taking place, the measured ambient noise levels at the nearest residence to the north (long-term noise monitoring Site #4), were unchanged. This is believed to be due to the considerable grade separation (approximately 40 feet) between the soccer fields and nearest residences to the north. That grade separation, which is approximately 40 feet, completely shields the nearest residences to the north from view of the existing soccer fields.

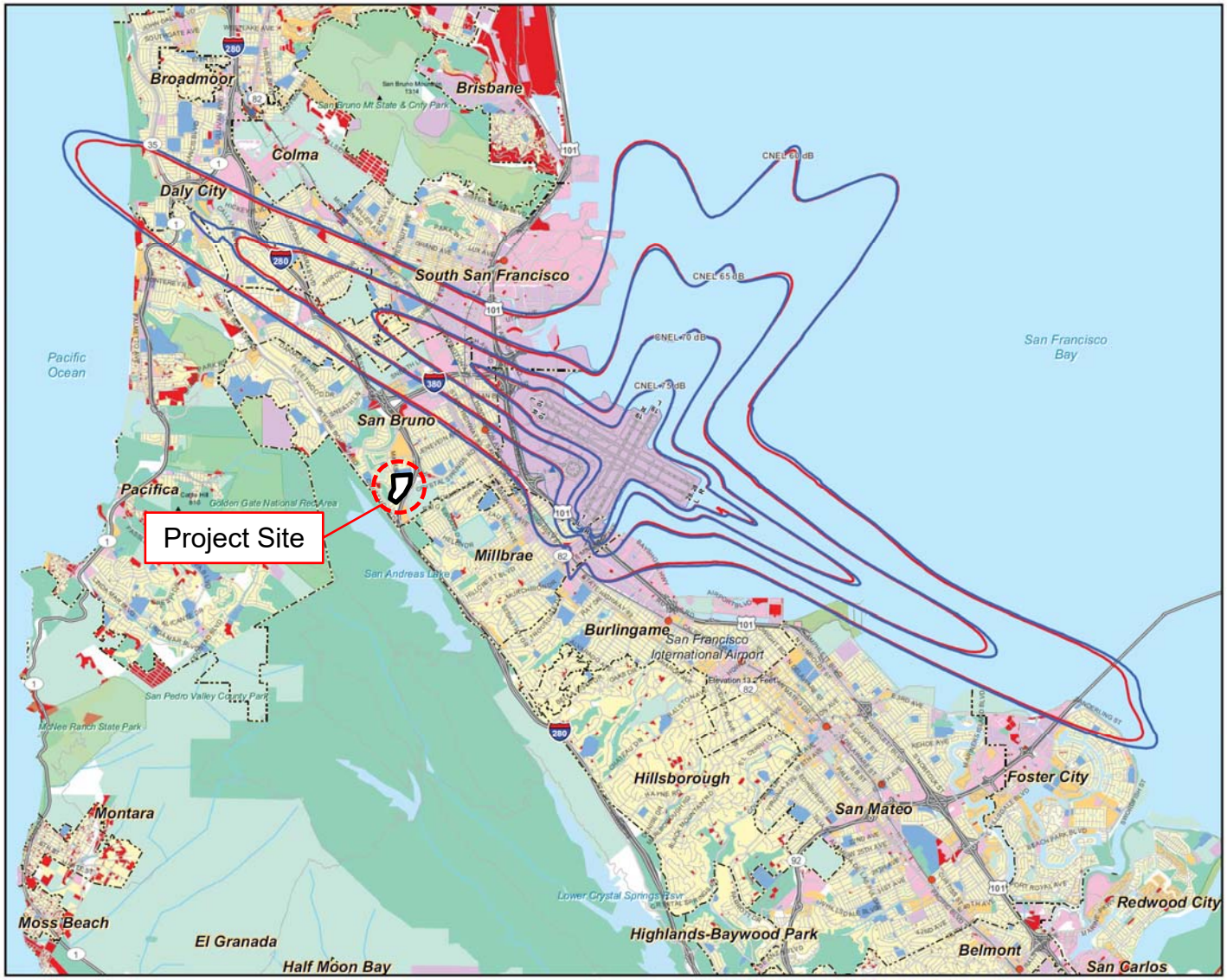
Existing Aircraft Noise Environment

The project site is located approximately 1.6 miles west of San Francisco International Airport (SFO). The airport's main flight paths extend well to the north of the project site, as do the airport's noise contours. Figure 6 shows the noise contours for SFO, and indicates the project site is located outside of the 60 dBA CNEL airport noise contour. As a result, aircraft overflights to the north of the project site were observed by BAC staff to occur frequently. Nonetheless, aircraft noise is well below the ALUCP noise standard of 65 dBA for new residential development. The noise contours are consistent with the long-term ambient noise survey results reported in Table 4, where typical DNL (effectively similar to CNEL) values were typically in the low 50's.

Existing Traffic Noise Environment

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to quantify existing traffic noise levels at the existing sensitive land uses nearest to the project area roadway network. The Model was also used to quantify the distances to the 60, 65 and 70 dB DNL traffic noise contours for these roadways. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop DNL values from L_{eq} values.

Existing Traffic data in the form of peak hour intersection turning movements were provided by the project transportation consultant. Those data were converted to Average Daily Traffic (ADT) segment volumes by multiplying the average of the AM and PM movements by a factor of 10. Other inputs were obtained from BAC observations and noise measurement data. The existing traffic noise levels at the distances representing the nearest sensitive land uses to the project area roadways and distances from the centerlines of selected roadways to the 60 dB, 65 dB and 70 dB DNL contours are summarized in Table 6. Appendix E-1 contains the FHWA Model inputs for existing conditions.



Legend

N

Scale (miles)

0 1 2

San Francisco International Airport

Forecast 2015 and 2020 Noise Contours

Source: Comprehensive Land Use Plan

Figure 6

BOLLARD Acoustical Consultants

Table 6
Existing Traffic Noise Levels at Nearest Receptors and Distances to DNL Contours Crestmoor, Piedmont 300 Development Project Vicinity – San Bruno, California

#	Roadway	Description	DNL at Nearest Sensitive Receptor	Distance to Contour (ft)		
				70 dB DNL	65 dB DNL	60 dB DNL
1	Skyline Blvd	North of San Bruno Ave W	66	72	154	332
2	Skyline Blvd	South of San Bruno Ave W	66	62	133	286
3	San Bruno Ave W	East of Skyline Blvd	65	33	70	151
4	San Bruno Ave	West of Interstate 280	65	43	94	202
5	San Bruno Ave	East of Interstate 280	68	42	92	197
6	Cunningham Way	South of Jenevin Ave	62	15	32	70
7	Jenevein Ave	East of Cunningham Way	63	16	35	76
8	Jenevein Ave	West of Cunningham Way	62	13	29	63
9	Courtland Dr	Whitman Way to Rosewood Dr	59	7	16	34
10	Whitman Way	East of Courtland Dr	60	10	22	47
11	Whitman Way	West of Courtland Dr	58	7	15	31
12	Courtland Dr	South of Rosewood Dr	57	6	12	27
13	Rosewood Dr	West of Courtland Dr	51	3	6	13
14	Madison Ave	North of Piedmont Ave	44	1	3	5
15	Courtland Dr	East of Madison Ave	49	2	3	7
16	Piedmont Ave	Madison Ave to Crestmoor Dr	49	2	4	9
17	Crestmoor Dr	North of Piedmont Ave	54	5	10	22
18	Crestmoor Dr	South of Piedmont Ave	57	4	10	20

Source: FHWA-RD-77-108 with inputs from project traffic impact study. Appendix E contains FHWA model inputs.

Existing Ambient Vibration Environment

During site visits conducted by BAC staff, vibration levels within the project vicinity were subjectively evaluated as being below the threshold of perception. In addition, no appreciable sources of vibration were observed to be present in the project vicinity. As a result, the existing ambient vibration environment in the project vicinity is considered to be negligible.

Noise and Vibration Impacts due to the Project

Noise generated by the project would result from project construction, increases in traffic noise levels on the local roadway network due to project-generated traffic, and noise generated by playing field activities. Residential yard maintenance and refuse collection are common noise sources associated with residential developments and noise from those sources is already present in the community. As a result, the focus of the assessment of noise impacts upon existing sensitive land uses in the project vicinity is on construction, off-site traffic, and playing field activities. The only appreciable source of vibration generation for the project would be construction. Each of these sources is evaluated below.

Thresholds of Significance

The State of California has established regulatory criteria that are applicable to this assessment. Specifically, Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. According to Appendix G of the CEQA guidelines, the project would result in a significant noise or vibration impact if the following occur:

1. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or other applicable standards of other agencies?
2. Generation of excessive groundborne vibration or groundborne noise levels?
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

It should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered significant according to CEQA. Because every physical process creates noise, even the addition of a single vehicle on a roadway, the use of audibility alone as significance criteria would be unworkable. CEQA requires a substantial increase in ambient noise levels before noise impacts are identified, not simply an audible change.

The Federal Interagency Commission on Noise (FICON) has developed a graduated scale for use in the assessment of noise level increases for ongoing project operations. The criteria shown in Table 7 was developed by FICON as a means of developing thresholds for impact identification for project-related noise level increases. The FICON standards have been used extensively in recent years in the preparation of the noise sections of Environmental Impact Reports that have been certified in many California cities and counties.

The use of the FICON standards is considered conservative relative to thresholds used by other agencies in the State of California. For example, the California Department of Transportation (Caltrans) requires a project-related traffic noise level increase of 12 dB for a finding of significance, and the California Energy Commission (CEC) considers project-related noise level increases between 5 to 10 dB significant, depending on local factors. Therefore, the use of the FICON standards, which set the threshold for finding of significant noise impacts as low as 1.5 dB, provides a very conservative approach to impact assessment for this project.

Table 7
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (DNL)	Change in Ambient Noise Level Due to Project
<60 dB	+5.0 dB or more
60 to 65 dB	+3.0 dB or more
>65 dB	+1.5 dB or more
Source: Federal Interagency Committee on Noise (FICON)	

Based on the FICON research, as shown in Table 7, a 5 dB increase in noise levels due to ongoing project operations is required for a finding of significant noise impact where ambient noise levels without the project are less than 60 dB DNL. Where pre-project ambient conditions are between 60 and 65 dB DNL, a 3 dB increase is applied as the standard of significance. Finally, in areas already exposed to higher noise levels, specifically pre-project noise levels in excess of 65 dB DNL, a 1.5 dB increase is considered by FICON as the threshold of significance.

Because construction and demolition activities tend to be short-term in nature, and occur primarily during less sensitive daytime hours, a common practice is to apply a 10 dB threshold of significance to construction-related noise level increases.

Construction Noise and Vibration

Impact 1: On-Site Demolition and Construction Noise Levels at Existing Sensitive Uses

During project demolition and construction, heavy equipment would be used for grading excavation, paving, hauling, and building construction, which would increase ambient noise levels during their use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project work area would also vary depending on the proximity of equipment activities to that point. Construction noise impacts from the development of the residential component and the recreational and open space component are evaluated in the following sections. Construction activities for the proposed project and proposed variant would occur on the same project site and involve the same kinds of activities, so construction impacts would be the same. Because construction and demolition activities tend to be short-term in nature, and occur primarily during less sensitive daytime hours, a common practice is to apply a 10 dB threshold of significance to construction-related noise level increases. In addition to applicable ordinances, that 10 dB threshold is also evaluated for this impact as an indicator of a significant noise impact.

Residential Component

Demolition of existing structures and construction of the residential component would require the use of the types of equipment outlined in Table 8 below. Table 8 includes the range of maximum noise levels for equipment expected to be used for the project at full-power operation at a distance of 100 feet. The Table 8 data also include predicted maximum equipment noise levels at a reference distance of 100 feet for comparison against City of San Bruno municipal code standards. In addition, the boundary of the nearest sensitive uses to the proposed residential development located approximately 175 feet away (calculations at that distance assume a standard spherical spreading loss of 6 dB per doubling of distance for maximum noise levels and a conservative 10 dBA offset to account for the substantial intervening topography and vegetation occurring between the project site and nearest residences).

Table 8
Construction Equipment Reference Noise Levels and Predicted Noise Levels

Equipment Description	Maximum Noise Level at 50 Feet (dBA) [a]	Maximum Noise Level at 100 Feet (dBA) [b]	Predicted Maximum Noise Level at 175 feet (dBA)[c]
Air compressor	80	74	59
Backhoe	80	74	59
Compactor	82	76	61
Concrete mixer	85	79	63
Concrete pump	82	76	61
Dozer	85	79	63
Generator	82	76	61
Grader	85	79	64
Loader	80	74	59
Paver	85	79	64
Pneumatic tools	85	79	64
Saw	76	70	55
Scraper	85	79	64
Truck	84	78	63

Source: Federal Transit Administration Noise and Vibration Impact Assessment Manual, Table 7-1 (2018)

[a] The distance between the Recreational and Open Space Component (soccer field) construction and the nearest off-site residences is 50 feet.
[b] The City of San Bruno Municipal Code construction noise thresholds apply at a distance of 100 feet.
[c] The distance between the Residential Component construction and the nearest off-site residences is approximately 175 feet.

Based on the equipment noise levels in Table 8, maximum noise levels at the nearest existing residential uses to the proposed residential construction (approximately 175 feet away), are expected to range from approximately 55 to 64 dBA L_{max}. Inspection of Table 8 (which shows approximate noise levels at 50 feet, and 100 feet), indicates that maximum noise levels generated by individual pieces of project construction equipment are not expected to exceed the City's code requirement of 85 dBA at 100 feet. However, if two pieces of equipment were to generate maximum noise levels simultaneously, maximum noise levels would exceed the values shown in Table 3.11-11 by 1 to 3 dB (due to the logarithmic nature of the decibel scale, the addition of two equal noise sources results in a 3 dBA increase). In such a case, the City's 85 dBA standard

would still not be exceeded at a reference distance of 100 feet. In addition, maximum noise levels generated by project construction would be in the same range as maximum ambient noise levels measured at the nearest residences to the project site. As a result, project construction is not predicted to result in substantial short-term increases in maximum noise levels at nearby residences.

Although maximum noise levels from construction activity are not expected to either exceed noise limits for construction or substantially exceed measured baseline maximum noise levels at the nearest offsite residences to the residential construction area during the construction activities likely to generate the highest levels of noise (i.e., site grading), a combination of scrapers, dozers, graders, loaders, and compactors could be in use concurrently. As a result, increases in average noise levels generated during the louder phases of project construction were evaluated at the nearest residences to determine if average construction noise levels would substantially exceed baseline conditions at nearby residences (i.e. 10 dBA or more increase).

Using the FHWA Roadway Construction Noise Model (RCNM, January 2006), the combined average noise level from the equipment types utilized during site grading activities (assuming a combination of scrapers, dozers, graders, loaders, and compactors) was computed to be approximately 63 dBA L_{eq} at the nearest residences.

Although the predicted average noise level of 63 dBA includes a 10 dB offset to account for the combination of vegetation and topography between the proposed residential construction area and the nearest residences, the area of the proposed residential construction is fairly flat and elevated relative to the neighboring residences. As a result, topographic shielding at the nearest residences during site grading activities occurring in more central areas of the site will be substantially greater than 10 dBA. In addition, construction activities for the residential component would be spread out and not concentrated at the nearest positions to existing residences (approximately 175 feet from residential component construction). Therefore, it is likely that actual average construction noise levels would frequently be less than 63 dBA L_{eq} at those residences.

As indicated in Table 4, existing average daytime noise levels typically ranged from 48 to 54 dBA Leq within the backyards of the nearest residences to the project site, with an overall daytime average of 51 dBA Leq (after omitting the anomalous 61 dBA Leq data point from measurement site 3 on April 17th). As such, average noise levels during worst-case project construction activities are predicted to be approximately 10 dBA above measured baseline average noise levels in the residential neighborhood. Because construction operations would typically be broad-band in frequency content, similar to the background noise environment, the perceived increases in average noise levels at the nearest residences is not anticipated to be dramatic despite the potential 10+ dBA increase during worst case noise-generating construction activities.

Even though project construction activities are not predicted to exceed the San Bruno Municipal Code standards applicable to project construction, because construction could result in short-term increases in average ambient noise levels exceeding 10 dBA at nearby residences during worst-case construction noise-generating activities, this impact is considered **potentially significant** for both the proposed project and project variant, and mitigation would be required.

Recreational and Open Space Component

For the recreational and open space component, it is expected that the worst-case construction phase in terms of noise generation would also be grading. At the residences located to the immediate north of the proposed playing fields (at a distance of approximately 50 feet), using the Table 8 data and assuming 15 dBA of attenuation provided by intervening topography, predicted maximum noise levels would be approximately 61 to 70 dBA Lmax. These levels could substantially exceed baseline ambient noise levels at the nearest residences to the north (monitoring Sites LT-3 and LT-4 in Table 4).

Inspection of Table 8 indicates that maximum noise levels generated by individual pieces of project construction equipment are not expected to exceed the City's code requirement of 85 dBA at 100 feet. However, if two pieces of equipment were to generate maximum noise levels simultaneously, maximum noise levels would exceed the values shown in Table 8 by 1 to 3 dB (due to the logarithmic nature of the decibel scale, the addition of two equal noise sources results in a 3 dBA increase). In such a case, the City's 85 dBA standard would still not be exceeded at a reference distance of 100 feet. In addition, maximum noise levels generated by project construction would be in the same range as maximum ambient noise levels measured at the nearest residences to the north of the project site. As a result, project construction is not predicted to result in substantial short-term increases in maximum noise levels at nearby residences.

During the construction activities likely to generate the highest levels of noise (i.e., site grading), a combination of scrapers, dozers, graders, loaders, and compactors could be in use concurrently. As a result, average noise levels from combined equipment operations could be substantial at nearby residences. Using the RCNM, the combined average noise level from the equipment types utilized during site grading activities was computed to be approximately 69 dBA L_{eq} at the nearest residences. Because construction activities would be spread out and not concentrated at the nearest position to existing residences (50 feet), actual average construction noise levels at those residences are expected to be below 69 dBA L_{eq}. Nonetheless, estimated average noise levels during construction could still substantially exceed baseline ambient noise levels at nearby residences to the north.

Although the predicted average noise level of 69 dBA includes a 15 dB offset to account for the combination of vegetation and topography between the proposed residential construction area and the nearest residences, the area of the proposed recreational and open-space construction is fairly flat and elevated relative to the neighboring residences. As a result, topographic shielding at the nearest residences during site grading activities occurring further south from the northern project site boundary will be substantially greater than 15 dBA. In addition, construction activities for the recreational and open space component would be spread out and not concentrated at the nearest positions to existing residences (approximately 50 feet from recreational component construction). Therefore, it is likely that actual average construction noise levels would frequently be less than 65 dBA L_{eq} at those residences.

As indicated in Table 4, existing average daytime noise levels at the residences to the north of the recreation area (represented by noise monitoring sites LT-3 and LT-4), typically ranged from 49 to 50 dBA Leq, with an overall daytime average of 49 dBA Leq (after omitting the anomalous

61 dBA Leq data point from measurement site 3 on April 17th). As such, average noise levels during worst-case project construction activities are predicted to be approximately 15 dBA above measured baseline average noise levels in the residential neighborhood. Because construction operations would typically be broad-band in frequency content, similar to the background noise environment, the perceived increases in average noise levels at the nearest residences is not anticipated to be dramatic despite the potential 15+ dBA increase during worst case noise-generating construction activities.

Even though project construction activities are not predicted to exceed the San Bruno Municipal Code standards applicable to project construction, because construction could result in short-term increases in average ambient noise levels exceeding 10 dBA at nearby residences during worst-case construction noise-generating activities, this impact is considered **potentially significant.**

Off-Site Sewer Line Rehabilitation – Whole Project

Existing six-inch sanitary sewer mains on Courtland Drive and Whitman Way will be rehabilitated as part of the project. Noise generated by this phase of the project would be less than that generated during site demolition and clearing activities, but would occur closer to existing residences. Due to the proximity of the sanitary sewer rehabilitation activities to existing residences average noise levels associated with the rehabilitation activities could exceed baseline ambient noise levels by 10 dBA or more at those nearby residences. As a result, ***noise impacts related to proposed rehabilitation of the sanitary sewer are considered potentially significant***.

Construction Haul Truck Noise – Whole Project

Approximately 92 daily heavy truck trips would be generated during the demolition phase of project construction for the removal of material from the site. The increase in traffic noise levels along the local roadway network which would result from this truck traffic was computed using the FHWA Traffic Noise Prediction Model (RD-77-108), The results of that analysis indicate that, along the roadways which would be utilized by the heavy trucks removing demolition debris from the site (Courtland Drive, Cunningham Way, and Whitman Way), the traffic noise level increases would range from 0.8 to 2.6 dBA DNL. Because this range of traffic noise level increase is below the 3-5 dBA threshold for a finding of a significant increase, ***noise impacts related to construction-generated heavy truck traffic are considered less than significant***.

Mitigation for Impact 1:

Mitigation Measure NOI-1a: Require Construction Noise Reduction Measures.

The following measures shall be incorporated into the project onsite construction activities in order to ensure compliance with the noise standards pertaining to construction noise contained in the City of San Bruno Municipal Code. In cases where a measure is considered infeasible (e.g., construction is needed outside allowable hours), the Planning Director shall review and approve that determination prior to that activity occurring to verify and track compliance with this measure.

- Noise-generating construction activities shall be limited to the hours of 7:00 a.m. to 10:00 p.m., as feasible.
- Combined construction noise for activities that take place between 7:00 a.m. and 10:00 p.m. shall be limited to 85 dBA Leq at a distance of 100 feet from construction activities, as feasible.
- Should noise-generating construction activities be required between 10:00 p.m. and 7:00 a.m., combined construction noise shall be limited to 60 dBA Leq at a distance of 100 feet from construction activities, as feasible.
- Temporary construction noise levels shall not result in an increase of 10 dBA or greater.
- Measures to achieve these performance standards include:
    - All noise-producing project equipment and vehicles using internal-combustion engines shall be equipped with manufacturers-recommended mufflers and be maintained in good working condition.
    - All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
    - Electrically powered equipment shall be used instead of pneumatic or internal-combustion-powered equipment, where feasible.
    - Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from existing noise-sensitive uses.
    - Nearby residences which border the project site, and the church located on the east side of Courtland drive, shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.
    - The name and telephone number of an onsite construction liaison who is available whenever construction is occurring shall be provided through onsite signage and on the notices mailed/delivered to surrounding land uses. If early morning or nighttime construction occurs, and construction noise during this time is found to be intrusive to the community (i.e., if complaints are received), the construction liaison shall take reasonable efforts in a reasonable amount of time to investigate

the source of the noise (including measuring noise levels) and require that sensible measures be implemented to correct the problem**.**

Mitigation Measure NOI-1b: Install Temporary Noise Barriers.

In the event that investigation of construction noise-related complaints by the construction liaison required by Mitigation Measure NOI-1a indicates that project construction activities are resulting in increases in ambient noise levels at nearby residential uses of 10 dBA or more, temporary noise barriers shall be installed as close as possible to the noise source or the receptor and positioned within the direct line-of-sight path between the noise source and nearby sensitive receptor(s), if feasible. In cases where this measure is required but considered infeasible (e.g., construction is needed outside allowable hours and noise barriers cannot be installed), the Planning Director shall review and approve that determination prior to that activity occurring to verify and track compliance with this measure. The barrier should be constructed of material that has a surface weight of at least 1 pound per square foot and has an acoustical rating of at least 25 STC (Sound Transmission Class). This can include a temporary barrier constructed with plywood support on a wood frame, sound curtains supported on a frame, or other comparable material.

Mitigation measures **NOI-1a** and **NOI-1b** require implementation of several measures to reduce noise as experienced at nearby sensitive uses during construction. The mitigation measures are anticipated to reduce the increase in average noise levels at the nearest residences during project construction to less than 10 dBA, which is below the significance criteria. As a result, this impact would be mitigated to a **less than significant** level.

Impact 2: Project Construction Vibration at Existing Residences

During project construction for both the Residential Component and the Recreational and Open Space Component, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest identified existing structures (newer engineered residences which are not highly susceptible to damage by vibration) are located approximately 175 feet from proposed residential construction, and likely at least 50 feet from any playing-field construction. Based on reference vibration level for heavy equipment of .035 to 0.089 inches/second at a reference distance of 25 feet, vibration levels at the nearest residences located approximately 50 feet or more from project construction would be approximately 0.04 inches/second. Because this level orders of magnitude below the 0.5 inch/second threshold for damage to structures or annoyance, this impact is considered ***less than significant***.

Off-Site Traffic Noise Level Increases

Impact 3: Increases in Existing Traffic Noise Levels Resulting from the Project at Existing Residences.

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to quantify increases in existing traffic noise levels at the existing sensitive land uses nearest to the project area roadway network. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop DNL values from L_{eq} values.

Traffic data in the form of peak hour intersection turning movements were provided by the project transportation consultant. Those data were converted to Average Daily Traffic (ADT) segment volumes by multiplying the average of the AM and PM movements by a factor of 10. Other inputs were obtained from BAC observations and noise measurement data.

The existing and existing plus project traffic noise levels at the distances representing the nearest sensitive land uses to the project area roadways are summarized in Table 9. Table 9 also shows the thresholds for determination of a significant traffic noise increase, whether the roadway segment contains sensitive uses, and whether or not significant noise impacts are identified for each segment.

Table 9 indicates that project-generated traffic noise level increases would not result in significant noise increases at existing sensitive receptors located along the project area roadway network. As a result, ***this impact is identified as being less than significant***.

Impact 4: Increases in Cumulative Traffic Noise Levels Resulting from the Project at Existing Residences.

According to the project transportation engineers (Fehr & Peers), no major transportation projects are planned for the area, which is largely built-out. In addition, none of the land use projects would change any of the transportation engineer's impact discussions or conclusions. In addition, Impact 3 concluded that project-generated traffic would not result in significant noise increases relative to existing traffic conditions so it can be concluded that the traffic noise level increase relative to future cumulative conditions (which would presumably be somewhat higher than existing volumes), would be even lower than the increases identified in Table 9. In light of this information, cumulative traffic noise impacts related to the project are identified as ***less than significant***.

Table 9
Predicted Traffic Noise Level Increases at Existing Sensitive Receptors – Existing vs. Existing Plus Project Conditions
Crestmoor, 300 Piedmont Avenue Development – San Bruno, California

#	Roadway	Segment Description	Predicted DNL, dBA			Significance Threshold[1]	Threshold Exceeded?	Sensitive Receptors Present?[2]	Significant Impact Identified?[3]
			Existing	Existing + Project	Increase				
1	Skyline Blvd	North of San Bruno Ave W	66.4	66.4	0.0	1.5	No	**Yes**	No
2	Skyline Blvd	South of San Bruno Ave W	65.7	65.7	0.0	1.5	No	**Yes**	No
3	San Bruno Ave W	East of Skyline Blvd	64.6	64.7	0.1	3.0	No	**Yes**	No
4	San Bruno Ave	West of Interstate 280	65.3	65.5	0.2	1.5	No	**Yes**	No
5	San Bruno Ave	East of Interstate 280	67.8	67.8	0.0	1.5	No	**Yes**	No
6	Cunningham Way	South of Jenevin Ave	62.2	62.3	0.1	3.0	No	**Yes**	No
7	Jenevein Ave	East of Cunningham Way	63.4	63.5	0.1	3.0	No	**Yes**	No
8	Jenevein Ave	West of Cunningham Way	62.1	62.4	0.3	3.0	No	**Yes**	No
9	Courtland Dr	Whitman Way to Rosewood Dr	58.8	60.7	1.9	5.0	No	**Yes**	No
10	Whitman Way	East of Courtland Dr	59.7	60.3	0.6	5.0	No	**Yes**	No
11	Whitman Way	West of Courtland Dr	58.4	59.4	1.0	5.0	No	**Yes**	No
12	Courtland Dr	South of Rosewood Dr	56.6	59.0	2.4	5.0	No	**Yes**	No
13	Rosewood Dr	West of Courtland Dr	50.6	50.7	0.1	5.0	No	**Yes**	No
14	Madison Ave	North of Piedmont Ave	44.4	45.1	0.7	5.0	No	**Yes**	No
15	Courtland Dr	East of Madison Ave	49.0	53.1	4.1	5.0	No	**Yes**	No
16	Piedmont Ave	Madison Ave to Crestmoor Dr	49.1	52.3	3.2	5.0	No	**Yes**	No
17	Crestmoor Dr	North of Piedmont Ave	53.9	54.9	1.0	5.0	No	**Yes**	No
18	Crestmoor Dr	South of Piedmont Ave	56.5	56.8	0.3	5.0	No	**Yes**	No

Notes:
1. Significance threshold derived from Table 7.
2. Sensitive receptors were considered to be residences of all densities, schools, & transient lodging facilities.
3. A significant impact is identified only along segments where the project-related traffic noise level increase would exceed the significance threshold AND where sensitive receptors are present along the roadway segment.

Source: FHWA-RD-77-108 with inputs from project traffic impact study. Appendix D contains FHWA Model inputs.

Playing Field Noise

Impact 5: Noise Impacts at Existing Residences Near the Proposed Playing Fields

The proposed project would include dedication of approximately 6 acres of public open space to the City. The City would own and maintain the 6 acres. The City would also construct improvements within the dedicated open space area in the northern area of the project site, including a sports field with permanent nighttime lighting fixtures and associated parking west of Courtland Drive. The City intends to allow the field to be used from 5:00 am to 10:00 p.m. daily; use of lighting would be subject to a rental application. The field would be striped to allow re-configuration of fields to accommodate various sizes of fields.

As of the preparation of this evaluation, the configuration of the fields has not been finalized. However, the conceptual site design shown in Figure 3 would allow for a maximum of 6 soccer playing fields in use at any one time. Another option would include striping for two little league fields and five soccer fields, allowing for a maximum of two little league games or five soccer games to occur at one time. The City also intends to develop various recreation, recreation supporting amenities, and/or parking on about 1.1 acres east of Courtland Drive. The proposed project also would set aside approximately 12.32 acres of privately owned, publicly accessible open space.

The project variant would include dedication of approximately 12 acres of land to the City for public open space. The playing fields and other recreational uses would be the same as with the proposed project, except that the graded area within the dedicated open space that could be improved by the City and used these facilities would be about .75 acres larger than with the proposed project.

The Table 5 data indicate that maximum and median noise levels at the reference noise measurement distance of 75 feet were approximately 70 dBA Lmax and 55 dBA L50, respectively, during the playing of two concurrent soccer games at the project site. Between the two games approximately 50 spectators were present. Noise generated during the games was primarily caused by parents cheering for their children and the coaches instructing their players. The players themselves did not generate appreciable noise.

The current field configuration allows for multiple soccer games to be played concurrently, as would the proposed playing field configuration. Assuming up to 6 games occurring concurrently, the increase in noise versus that generated during the two games which were played concurrently during the noise survey computes to an approximate 5 dBA increase[1]. However, the noise generation would be spread throughout the playing field areas, not concentrated at a distance of 75-feet from the nearest residences. As a result, maximum playing field noise levels at the nearest residences were computed from the nearest spectator location, which was scaled from Figure 4 to be approximately 75 feet. Average/median playing field noise levels at the nearest residences were computed from the center of the playing field site, or approximately 200 feet from the nearest residences.

In addition to the effects of distance on the predicted playing field noise levels, intervening topography would also have a substantial effect on the transmission of sound between the playing fields and nearby residences. This is because the nearest residences to the north of the playing fields are at substantially lower elevations than the playing field site. From the ambient noise level data collected at monitoring site LT-4 during periods when soccer games were occurring at the project site, this shielding was computed to reduce playing field noise by approximately 15 dBA.

Based on the effects of topographic shielding, the assumptions regarding the locations where the maximum and median noise generation would originate, and the reference playing field noise level data cited above, maximum and median playing field noise levels were computed at the nearest residences. The predicted maximum playing field noise levels at the nearest residences would be approximately 60 dBA Lmax and the predicted median noise levels at the nearest residences would be approximately 36 dBA L50.

As indicated in Table 4, baseline median noise levels at long-term ambient monitoring Site 4 were 47 dBA during daytime hours. Adding the predicted 36 dBA L50 value to the existing 47 dBA L50 value yields a worst-case median noise level of 47 dBA, which represents a negligible change in noise levels over existing ambient conditions at the nearest residences. This level of increase would be satisfactory relative to San Bruno Municipal Code Section 6.16.050 and relative to the more conservative FICON criteria shown in Table 7. As a result, noise generated by activities on the proposed playing fields is not expected to exceed City of San Bruno noise standards or substantially exceed existing ambient noise levels at the nearest residences to the proposed playing fields. Therefore, ***this impact is considered less than significant***.

[1] The 5 dBA increase is computed as follows: dBA increase = 10 * Log (number of future games / number of games occurring during monitoring period) = 10*log(6 games / 2 games) = 5 dBA

Mechanical Equipment Noise

Impact 6: Noise Impacts at Existing Residences Resulting from Proposed Residential Air Conditioning Condensers.

A common noise source associated with residential developments is air conditioning condenser units. Although the precise locations of project HVAC equipment are not known at this time, the 155 HVAC units (one per residence) would likely be ground-mounted adjacent to the individual home served by that specific HVAC unit. Typical single-family residential dwelling condenser units generate sound power levels of approximately 71-76 dBA (see Appendix F). Noise generated by residential condenser units is frequently shielded from neighboring residential units by privacy fences or residential structures. Given a distance of 150 feet from the nearest proposed residences to the nearest existing residences in the project vicinity, attenuation by distance alone would reduce condenser noise levels to 27 to 32 dBA at those nearest residences. With multiple condenser units operating concurrently, the distance to the more distant condensers would be considerably greater than 150 feet and the aforementioned shielding would occur. After consideration of the effects of shielding by topography, privacy fences, and other residential structures, as well as absorption by intervening vegetation, condenser noise levels resulting from the project are not expected to exceed 35 dBA at existing residences, even during periods when multiple condenser units are operating. Because this level is both below City of San Bruno noise standards and below measured baseline ambient noise levels at the existing residences surrounding the project site, ***this impact is considered less than significant***.

Aircraft Noise Impacts

Impact 7: Noise Impacts at Future Residents of the Development Resulting from San Francisco International Airport Operations.

As indicated by the noise contours for San Francisco International Airport shown on Figure 6, the project site is located well beyond the airport's 60 dBA CNEL noise contour. Because new residential uses are permitted in aircraft noise exposure up to 65 dBA CNEL, no exceedance of the aircraft noise standards would occur at the project site. There would be ***no impact*** related to aircraft noise.

Other Noise Considerations for the Project

The California Supreme Court issued an opinion in *California Building Industry Association v. Bay Area Air Quality Management District (2015)* holding that CEQA is primarily concerned with the impacts of a project *on* the environment and generally does not require agencies to analyze the impact of existing of future conditions on a project's future users or residents. Nevertheless, The City of San Bruno has General Plan policies that address existing/future conditions affecting future residential uses within the project site. As a result, noise impacts upon the project are evaluated for General Plan consistency in the following section. Note that these discussions are provided because these effects are considered in the planning process for development projects; they are not specifically pertinent to the CEQA evaluation for the proposed project.

Traffic Noise at Project Residences

Future Traffic Noise Levels within Outdoor Use Areas (Backyards) of Residences proposed Near Courtland Drive.

As indicated by Figure 2, the project proposes residential uses adjacent to Courtland Drive. The FHWA Model was used to predict future Courtland Drive traffic noise levels at those proposed residences. The results of the FHWA analysis indicate that existing plus project traffic noise exposure within those nearest backyard areas would be approximately 59 dBA DNL. However, should traffic noise increase by as much as 2 dBA in the future the City's 60 dBA DNL exterior noise standard could be exceeded within those backyard areas.

Recommendation for Traffic Noise Reduction at Project Outdoor Use Areas:

To ensure satisfaction with the applicable City of San Bruno General Plan exterior noise standards within the backyard areas of the residences proposed adjacent to Courtland Drive, the following specific noise mitigation measure should be implemented:

Reduction Measure for Traffic Noise:

A solid noise barrier measuring 6-feet in height relative to proposed backyard elevations shall be constructed along the residential property lines of the lots proposed adjacent to Courtland Drive. The barrier shall be wrapped to the north along each side of the project site access road a distance of 50 feet. Appendix G-2 shows the results of the noise barrier calculations. This requirement would not apply to residences which is face Courtland Drive as the backyards will be further setback from that roadway and shielded by the residences themselves.

Future Traffic Noise Levels within Interior Areas of Residences Proposed Adjacent to Courtland Drive

As indicated in Impact 6, future traffic noise exposure at the nearest proposed residences to Courtland Drive would be approximately 60 dBA DNL. Because standard residential construction in accordance with building code requirements provides at least 25 dBA of exterior to interior traffic noise attenuation, future interior noise levels within these residences will be approximately 35 dB DNL or less. In conclusion, the predicted interior noise level of 35 dBA would be well below the City of San Bruno 45 dB DNL interior noise standard.

Playing Field Noise Impacts

Noise at Proposed Residences Located Near the Playing Fields

Although the plans for the playing fields have yet to be finalized, review of the proposed project site plans indicates that some residences could be located in close proximity to areas containing playing fields. Without more specific information pertaining to the layout of playing fields, precise predictions of noise generated during playing field usage cannot be made. However, it does appear possible that playing fields could be located as close as 50-75 feet from the northernmost residences proposed within the project site. If this is the case, then playing field noise levels of up to 75 dBA Lmax and 60 dBA L50 may be experienced at those residences during periods of intensive field usage. In conclusion, there is a potential exposure for future residents of the project to be exposed to elevated noise levels generated by the playing field activities

Recommendation for Playing Field Noise Reduction at Project Outdoor Use Areas: To ensure satisfaction with the applicable City of San Bruno General Plan exterior noise standards within the backyard areas and interior spaces of the residences proposed nearest to the playing fields, the following specific noise mitigation measure should be implemented:

Reduction Measure for Playing Field Noise

At such time as plans are finalized for the proposed playing fields, an acoustical analysis focusing on those plans should be prepared to determine if playing-field generated noise could exceed City of San Bruno noise standards at the nearest proposed residences in the development. If the analysis determines the City's noise standards could be exceeded at proposed residences, specific noise mitigation measures should be developed and implemented. Such measures could include increasing setbacks between bleacher areas and residences, constructing noise barriers to shield affected residences, restrictions on usage of the playing fields located nearest to the residences, or other remedies.

Appendix A
Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

Decibel or dB Fundamental unit of sound. A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.

IIC Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.

L_{dn} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{eq} Equivalent or energy-averaged sound level.

L_{max} The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.

RT_{60} The time it takes reverberant sound to decay by 60 dB once the source has been removed.

STC Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.









Legend

A Site 1 Noise Measurement Location

B Site 2 Noise Measurement Location

C Site 3 Noise Measurement Location

D Site 4 Noise Measurement Location

Long-Term Noise Survey Locations

300 Piedmont Development

San Bruno, California

Appendix B-1

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Legend

A Site 1 Noise Measurement Location

B Site 1 Noise Measurement Location

C Site 2 Noise Measurement Location

D Site 2 Noise Measurement Location

Short-Term Soccer Game
Noise Survey Locations
300 Piedmont Development
San Bruno, California

Appendix B-2

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Appendix C-1
Long-Term Ambient Noise Monitoring Results - Site 1
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	40	58	35	31
1:00 AM	36	56	33	29
2:00 AM	34	54	32	28
3:00 AM	34	50	33	27
4:00 AM	38	58	36	31
5:00 AM	43	57	40	37
6:00 AM	46	64	42	40
7:00 AM	48	65	44	42
8:00 AM	49	67	45	43
9:00 AM	47	65	44	43
10:00 AM	48	62	46	44
11:00 AM	48	63	46	45
12:00 PM	49	67	48	47
1:00 PM	49	67	47	46
2:00 PM	48	64	47	46
3:00 PM	50	62	48	46
4:00 PM	51	75	49	46
5:00 PM	48	65	46	45
6:00 PM	46	60	45	43
7:00 PM	48	63	45	44
8:00 PM	49	63	46	43
9:00 PM	46	60	44	42
10:00 PM	47	63	44	41
11:00 PM	42	58	40	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	51	46	48	47	34	42
Lmax (Maximum)	75	60	65	64	50	57
L50 (Median)	49	44	46	44	32	37
L90 (Background)	47	42	44	41	27	33

Computed DNL, dB	50
% Daytime Energy	88%
% Nighttime Energy	12%

GPS Coordinates	37°36'37.59"N
	122°25'45.29"W

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Appendix C-2
Long-Term Ambient Noise Monitoring Results - Site 1
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	42	59	37	34
1:00 AM	38	63	34	31
2:00 AM	35	56	33	29
3:00 AM	36	58	33	28
4:00 AM	39	57	37	32
5:00 AM	43	55	41	38
6:00 AM	45	64	42	40
7:00 AM	51	80	44	41
8:00 AM	47	60	45	43
9:00 AM	49	74	44	43
10:00 AM	49	69	46	44
11:00 AM	49	62	47	45
12:00 PM	49	64	48	45
1:00 PM	49	69	47	45
2:00 PM	50	76	47	45
3:00 PM	50	66	48	46
4:00 PM	49	66	48	47
5:00 PM	50	62	48	47
6:00 PM	50	63	48	47
7:00 PM	48	72	46	44
8:00 PM	46	56	45	43
9:00 PM	48	58	47	44
10:00 PM	45	59	43	40
11:00 PM	43	58	39	35

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	51	46	49	45	35	42
Lmax (Maximum)	80	56	66	64	55	59
L50 (Median)	48	44	46	43	33	38
L90 (Background)	47	41	44	40	28	34

Computed DNL, dB	50
% Daytime Energy	89%
% Nighttime Energy	11%

GPS Coordinates	37°36'37.59"N
	122°25'45.29"W

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Appendix C-3
Long-Term Ambient Noise Monitoring Results - Site 1
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	37	52	33	30
1:00 AM	35	56	32	28
2:00 AM	36	51	34	31
3:00 AM	39	56	37	33
4:00 AM	43	56	42	38
5:00 AM	48	68	46	44
6:00 AM	50	65	48	47
7:00 AM	52	66	49	47
8:00 AM	51	71	48	46
9:00 AM	49	67	48	46
10:00 AM	64	89	49	46
11:00 AM	50	65	47	45
12:00 PM	50	69	48	46
1:00 PM	53	69	49	47
2:00 PM	53	76	49	47
3:00 PM	52	74	50	48
4:00 PM	52	70	50	48
5:00 PM	51	71	49	48
6:00 PM	50	63	48	46
7:00 PM	48	61	46	44
8:00 PM	47	60	45	43
9:00 PM	48	68	45	43
10:00 PM	48	61	45	41
11:00 PM	42	55	40	35

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	64	47	54	50	35	45
Lmax (Maximum)	89	60	69	68	51	58
L50 (Median)	50	45	48	48	32	40
L90 (Background)	48	43	46	47	28	36

Computed DNL, dB	55
% Daytime Energy	94%
% Nighttime Energy	6%

GPS Coordinates	37°36'37.59"N
	122°25'45.29"W

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Appendix C-4
Long-Term Ambient Noise Monitoring Results - Site 2
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	42	57	40	38
1:00 AM	40	57	36	34
2:00 AM	37	60	35	33
3:00 AM	35	48	34	33
4:00 AM	36	56	34	33
5:00 AM	37	49	36	34
6:00 AM	44	63	41	39
7:00 AM	44	62	42	40
8:00 AM	53	62	50	43
9:00 AM	56	68	51	44
10:00 AM	50	72	48	45
11:00 AM	50	62	48	46
12:00 PM	50	69	49	47
1:00 PM	52	61	51	49
2:00 PM	49	61	49	47
3:00 PM	49	59	48	47
4:00 PM	50	64	49	47
5:00 PM	51	62	50	48
6:00 PM	48	60	47	45
7:00 PM	47	58	46	45
8:00 PM	47	62	46	45
9:00 PM	47	60	45	44
10:00 PM	45	56	44	43
11:00 PM	46	61	43	41

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	56	44	50	46	35	42
Lmax (Maximum)	72	58	63	63	48	56
L50 (Median)	51	42	48	44	34	38
L90 (Background)	49	40	45	43	33	36

Computed DNL, dB	51
% Daytime Energy	92%
% Nighttime Energy	8%

GPS Coordinates	37°36'46.60"N
	122°25'46.89"W

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Appendix C-5
Long-Term Ambient Noise Monitoring Results - Site 2
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	43	59	41	39
1:00 AM	43	59	39	37
2:00 AM	38	52	37	35
3:00 AM	36	50	36	34
4:00 AM	38	60	35	34
5:00 AM	39	54	38	35
6:00 AM	45	61	44	41
7:00 AM	46	61	45	43
8:00 AM	47	61	44	42
9:00 AM	48	66	46	43
10:00 AM	49	64	47	46
11:00 AM	51	72	49	47
12:00 PM	59	76	51	48
1:00 PM	57	72	51	48
2:00 PM	51	69	48	45
3:00 PM	52	76	47	45
4:00 PM	54	72	49	46
5:00 PM	54	74	50	48
6:00 PM	51	68	50	48
7:00 PM	51	65	50	48
8:00 PM	48	59	47	45
9:00 PM	48	60	48	45
10:00 PM	49	63	48	45
11:00 PM	45	58	43	41

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	59	46	53	49	36	44
Lmax (Maximum)	76	59	67	63	50	57
L50 (Median)	51	44	48	48	35	40
L90 (Background)	48	42	46	45	34	38

Computed DNL, dB	53
% Daytime Energy	93%
% Nighttime Energy	7%

GPS Coordinates	37°36'46.60"N
	122°25'46.89"W

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Appendix C-6
Long-Term Ambient Noise Monitoring Results - Site 2
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	42	56	40	37
1:00 AM	40	53	38	35
2:00 AM	37	57	35	33
3:00 AM	37	49	36	34
4:00 AM	41	51	41	38
5:00 AM	44	56	44	41
6:00 AM	48	60	47	45
7:00 AM	50	64	49	48
8:00 AM	50	61	49	47
9:00 AM	51	72	47	44
10:00 AM	51	61	50	47
11:00 AM	52	68	50	49
12:00 PM	50	61	49	48
1:00 PM	50	66	48	47
2:00 PM	49	61	47	44
3:00 PM	47	66	44	42
4:00 PM	47	61	45	42
5:00 PM	54	71	46	43
6:00 PM	47	62	45	43
7:00 PM	47	59	45	43
8:00 PM	45	61	42	39
9:00 PM	44	57	42	40
10:00 PM	48	71	42	40
11:00 PM	48	59	46	41

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	54	44	49	48	37	45
Lmax (Maximum)	72	57	63	71	49	57
L50 (Median)	50	42	46	47	35	41
L90 (Background)	49	39	44	45	33	38

Computed DNL, dB	52
% Daytime Energy	84%
% Nighttime Energy	16%

GPS Coordinates	37°36'46.60"N
	122°25'46.89"W

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Appendix C-7
Long-Term Ambient Noise Monitoring Results - Site 3
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	42	58	38	35
1:00 AM	40	55	35	32
2:00 AM	37	57	34	31
3:00 AM	34	46	32	30
4:00 AM	35	58	33	30
5:00 AM	37	54	35	31
6:00 AM	43	62	40	37
7:00 AM	43	60	40	37
8:00 AM	50	75	42	39
9:00 AM	45	58	43	41
10:00 AM	46	58	44	40
11:00 AM	48	59	46	43
12:00 PM	48	64	47	45
1:00 PM	53	73	51	48
2:00 PM	50	66	49	46
3:00 PM	51	62	49	46
4:00 PM	53	62	52	48
5:00 PM	49	61	48	46
6:00 PM	47	58	45	43
7:00 PM	46	60	44	42
8:00 PM	45	59	44	42
9:00 PM	45	61	43	41
10:00 PM	43	59	41	40
11:00 PM	44	58	42	39

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53	43	49	44	34	41
Lmax (Maximum)	75	58	62	62	46	56
L50 (Median)	52	40	46	42	32	37
L90 (Background)	48	37	43	40	30	34

Computed DNL, dB	50
% Daytime Energy	91%
% Nighttime Energy	9%

GPS Coordinates	37°36'56.12"N
	122°25'46.89"W

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Appendix C-8
Long-Term Ambient Noise Monitoring Results - Site 3
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	42	56	39	37
1:00 AM	42	69	37	34
2:00 AM	36	49	35	33
3:00 AM	35	44	34	32
4:00 AM	37	56	34	31
5:00 AM	39	54	36	33
6:00 AM	44	60	43	40
7:00 AM	46	62	43	40
8:00 AM	47	61	43	40
9:00 AM	49	60	48	44
10:00 AM	48	61	47	43
11:00 AM	49	62	48	44
12:00 PM	50	58	48	45
1:00 PM	50	61	48	45
2:00 PM	49	71	47	44
3:00 PM	49	74	46	44
4:00 PM	53	74	48	45
5:00 PM	49	59	48	46
6:00 PM	55	76	49	46
7:00 PM	51	63	49	47
8:00 PM	48	61	46	43
9:00 PM	48	63	46	43
10:00 PM	50	62	48	44
11:00 PM	47	59	45	42

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	55	46	50	50	35	44
Lmax (Maximum)	76	58	64	69	44	57
L50 (Median)	49	43	47	48	34	39
L90 (Background)	47	40	44	44	31	36

Computed DNL, dB	52
% Daytime Energy	87%
% Nighttime Energy	13%

GPS Coordinates	37°36'56.12"N
	122°25'46.89"W

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Appendix C-9
Long-Term Ambient Noise Monitoring Results - Site 3
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	44	58	42	35
1:00 AM	40	61	36	33
2:00 AM	38	62	36	33
3:00 AM	37	49	36	33
4:00 AM	39	51	38	35
5:00 AM	42	58	41	38
6:00 AM	47	63	45	43
7:00 AM	49	64	46	44
8:00 AM	54	74	50	46
9:00 AM	73	88	70	54
10:00 AM	52	81	47	45
11:00 AM	51	63	49	46
12:00 PM	49	59	48	44
1:00 PM	48	65	46	43
2:00 PM	49	60	46	44
3:00 PM	50	75	46	43
4:00 PM	48	61	46	44
5:00 PM	47	57	46	43
6:00 PM	51	72	46	44
7:00 PM	48	70	46	44
8:00 PM	46	57	44	41
9:00 PM	46	60	44	41
10:00 PM	48	70	44	41
11:00 PM	49	59	48	42

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	73	46	61	49	37	45
Lmax (Maximum)	88	57	67	70	49	59
L50 (Median)	70	44	48	48	36	41
L90 (Background)	54	41	44	43	33	37

Computed DNL, dB	60
% Daytime Energy	99%
% Nighttime Energy	1%

GPS Coordinates	37°36'56.12"N
	122°25'46.89"W

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Appendix C-10
Long-Term Ambient Noise Monitoring Results - Site 4
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	44	58	41	37
1:00 AM	41	59	37	33
2:00 AM	38	58	35	32
3:00 AM	35	43	34	32
4:00 AM	35	51	34	31
5:00 AM	40	64	36	33
6:00 AM	47	57	45	41
7:00 AM	46	61	44	41
8:00 AM	47	59	46	43
9:00 AM	47	61	45	43
10:00 AM	46	58	44	42
11:00 AM	49	58	48	46
12:00 PM	49	60	48	46
1:00 PM	53	61	52	49
2:00 PM	51	62	50	48
3:00 PM	51	60	50	48
4:00 PM	51	63	50	48
5:00 PM	51	59	50	48
6:00 PM	49	58	48	46
7:00 PM	49	60	47	45
8:00 PM	48	60	47	45
9:00 PM	48	64	46	45
10:00 PM	46	60	45	43
11:00 PM	47	58	44	42

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53	46	49	47	35	43
Lmax (Maximum)	64	58	60	64	43	56
L50 (Median)	52	44	48	45	34	39
L90 (Background)	49	41	46	43	31	36

Computed DNL, dB	51
% Daytime Energy	87%
% Nighttime Energy	13%

GPS Coordinates	37°36'57.02"N
	122°25'40.11"W

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Appendix C-11
Long-Term Ambient Noise Monitoring Results - Site 4
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	44	56	42	40
1:00 AM	44	59	40	37
2:00 AM	39	48	38	35
3:00 AM	37	52	36	33
4:00 AM	39	59	35	33
5:00 AM	42	60	38	35
6:00 AM	47	55	46	41
7:00 AM	48	63	47	44
8:00 AM	49	63	47	43
9:00 AM	49	60	47	44
10:00 AM	47	60	45	44
11:00 AM	49	60	48	46
12:00 PM	50	61	49	46
1:00 PM	50	59	48	46
2:00 PM	49	60	48	45
3:00 PM	48	59	47	45
4:00 PM	50	60	49	46
5:00 PM	50	59	49	47
6:00 PM	51	63	49	48
7:00 PM	51	63	50	48
8:00 PM	49	62	48	45
9:00 PM	49	61	48	45
10:00 PM	52	63	51	46
11:00 PM	48	59	47	44

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	51	47	49	52	37	46
Lmax (Maximum)	63	59	61	63	48	57
L50 (Median)	50	45	48	51	35	41
L90 (Background)	48	43	45	46	33	38

Computed DNL, dB	53
% Daytime Energy	78%
% Nighttime Energy	22%

GPS Coordinates	37°36'57.02"N
	122°25'40.11"W

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Appendix C-12
Long-Term Ambient Noise Monitoring Results - Site 4
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023

Hour	Leq	Lmax	L50	L90
12:00 AM	46	58	45	38
1:00 AM	41	59	38	35
2:00 AM	38	52	37	34
3:00 AM	38	45	37	33
4:00 AM	41	48	41	38
5:00 AM	45	57	44	41
6:00 AM	49	64	47	44
7:00 AM	49	58	48	47
8:00 AM	50	62	49	48
9:00 AM	51	70	50	47
10:00 AM	49	59	48	45
11:00 AM	52	60	51	48
12:00 PM	49	62	48	45
1:00 PM	49	62	47	45
2:00 PM	49	60	47	45
3:00 PM	49	60	47	44
4:00 PM	48	61	46	44
5:00 PM	47	58	46	44
6:00 PM	47	60	46	44
7:00 PM	47	59	45	43
8:00 PM	46	58	43	41
9:00 PM	46	64	43	40
10:00 PM	48	72	42	40
11:00 PM	47	60	46	41

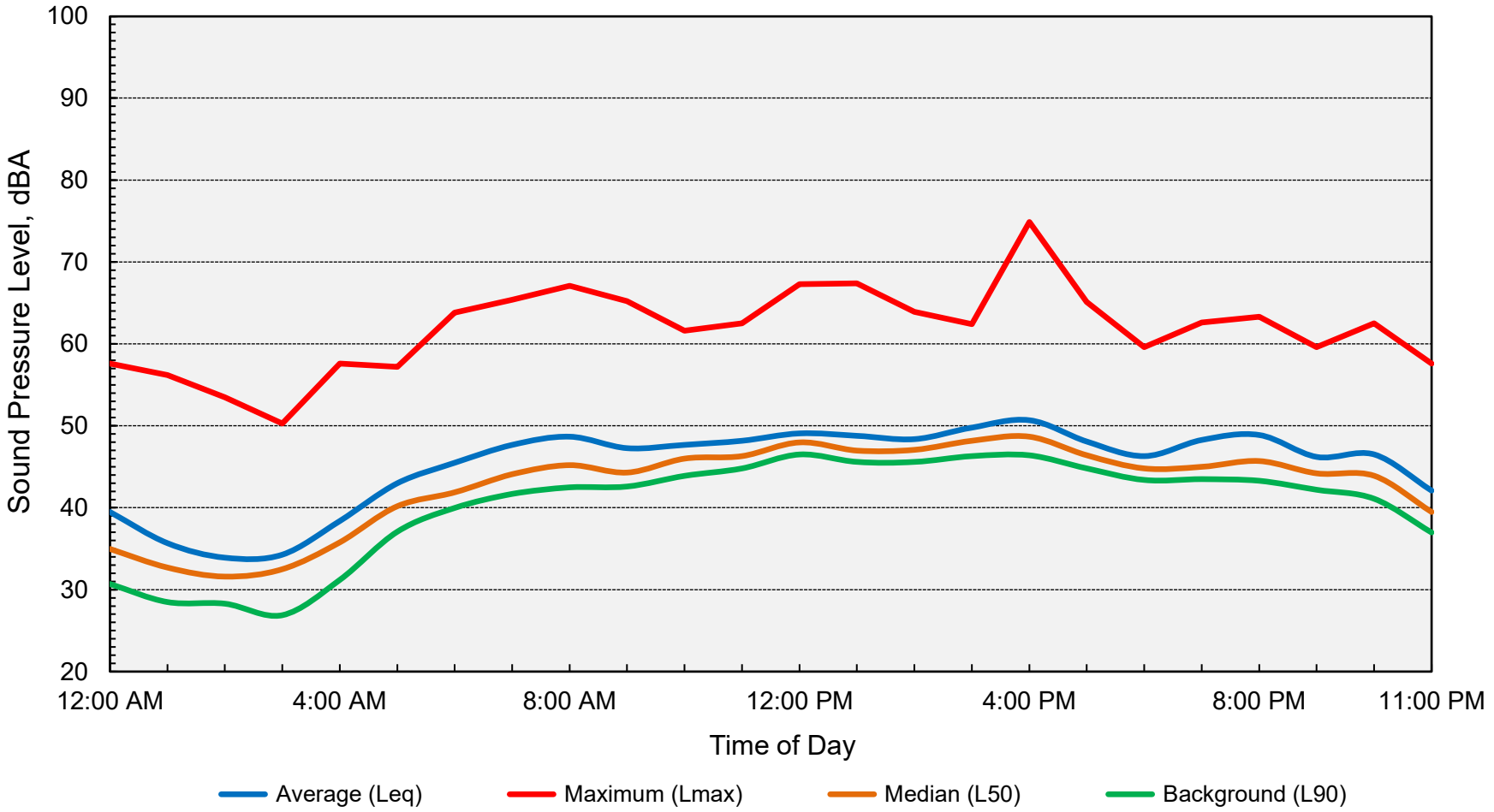
	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	52	46	49	49	38	45
Lmax (Maximum)	70	58	61	72	45	57
L50 (Median)	51	43	47	47	37	42
L90 (Background)	48	40	45	44	33	38

Computed DNL, dB	52
% Daytime Energy	79%
% Nighttime Energy	21%

GPS Coordinates	37°36'57.02"N
	122°25'40.11"W

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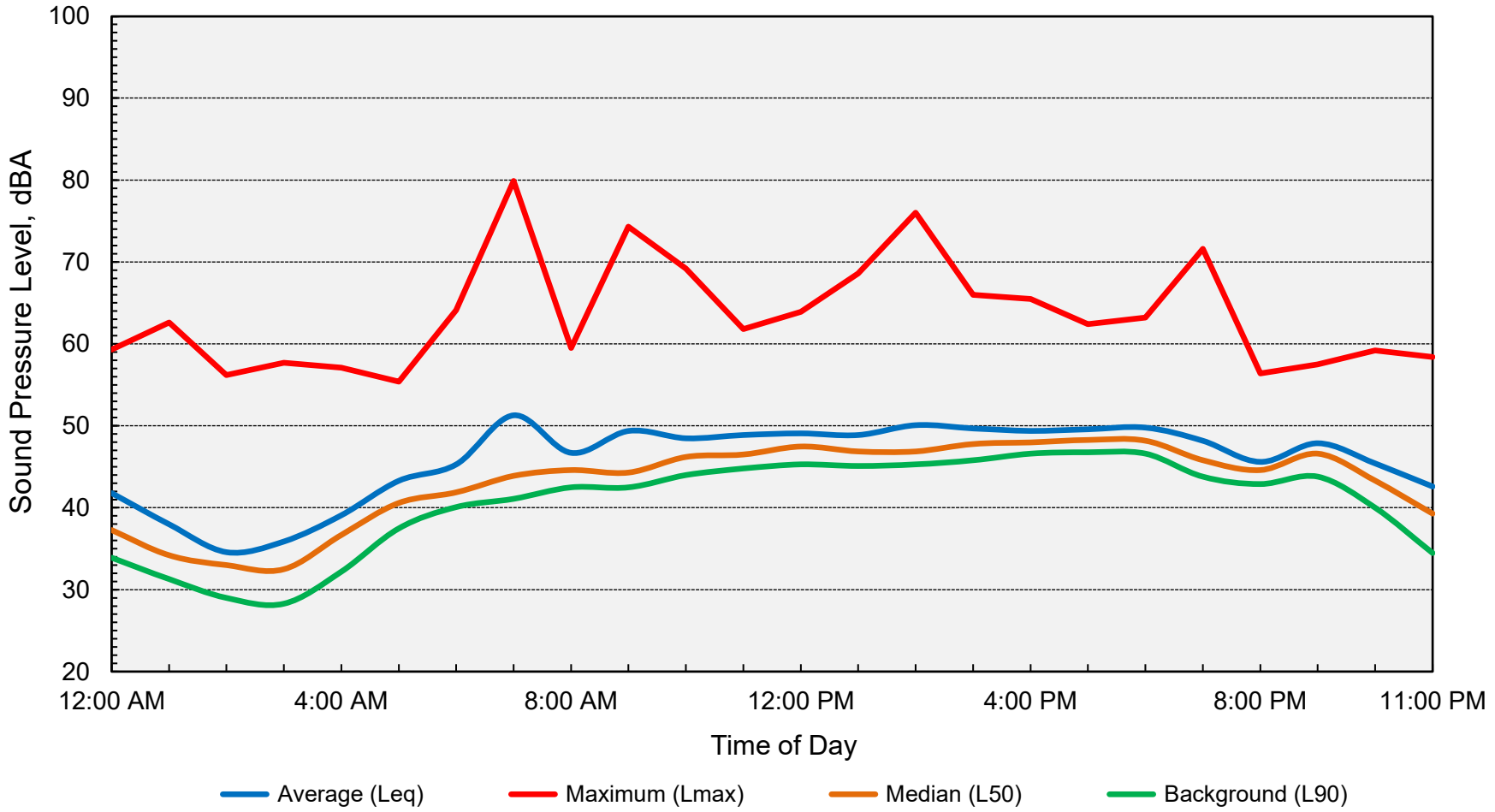
Appendix D-1
Long-Term Ambient Noise Monitoring Results - Site 1
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023



Computed DNL = 50 dB

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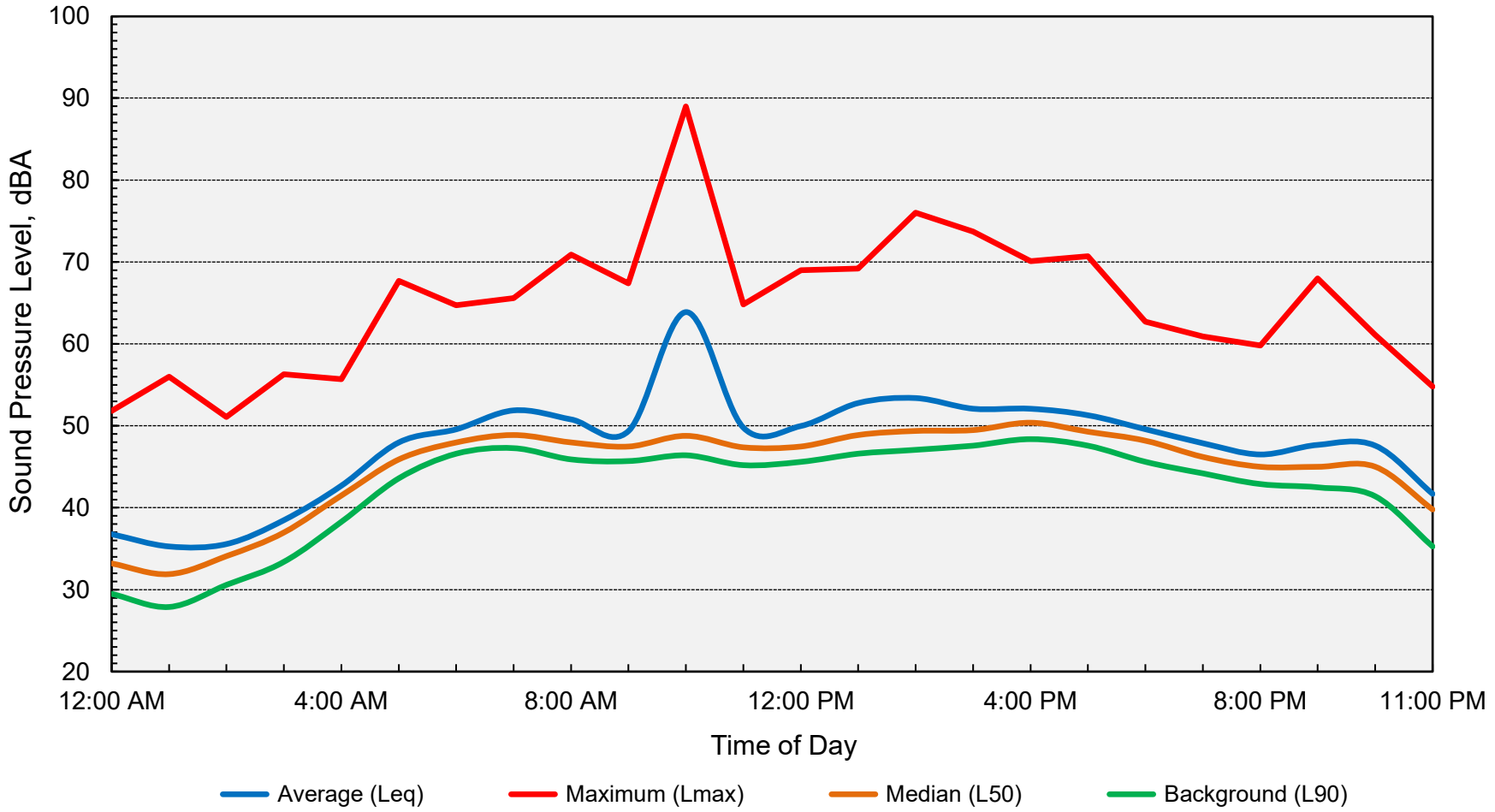
Appendix D-2
Long-Term Ambient Noise Monitoring Results - Site 1
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023



Computed DNL = 50 dB

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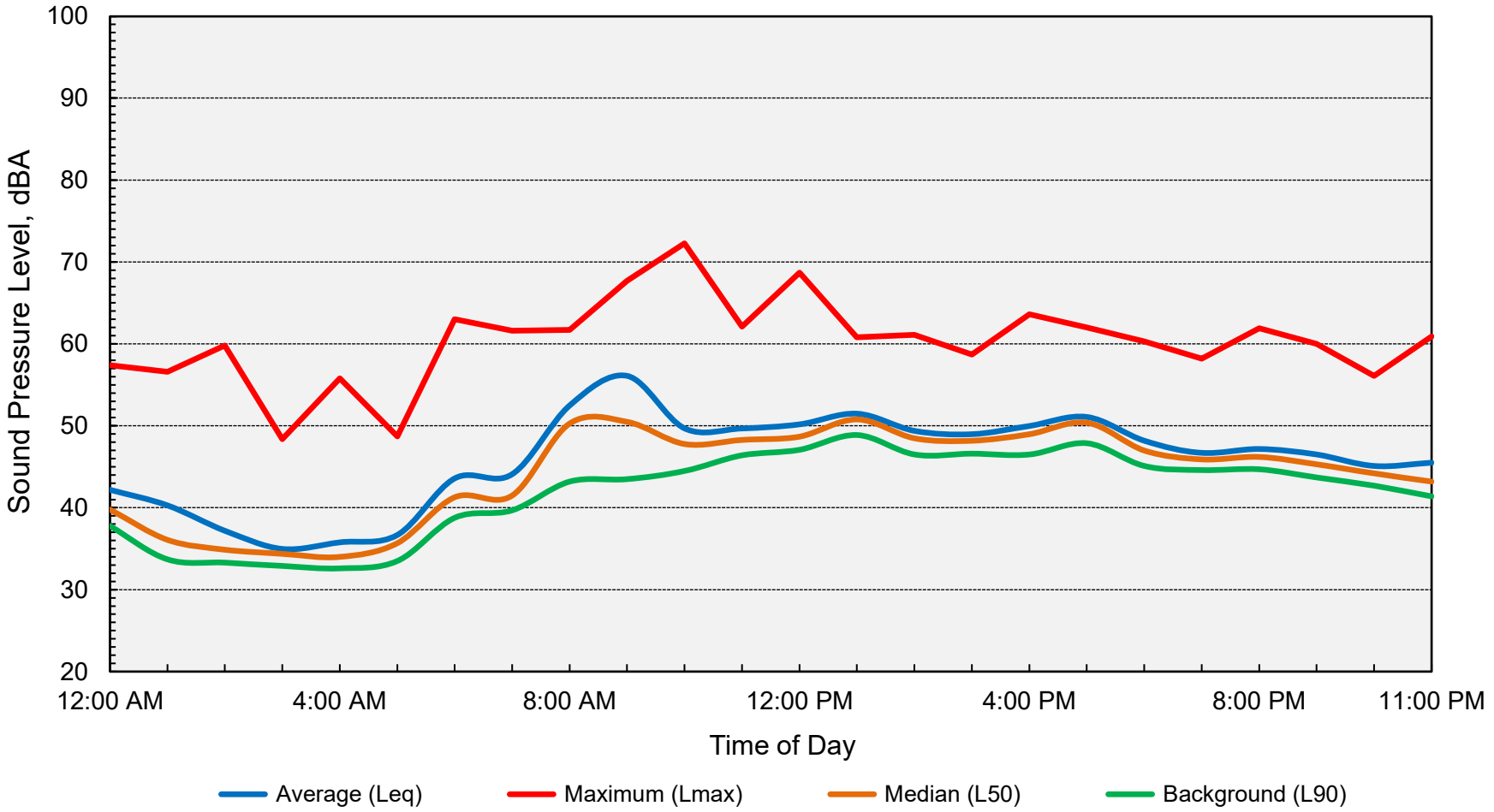
Appendix D-3
Long-Term Ambient Noise Monitoring Results - Site 1
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023



Computed DNL = 55 dB

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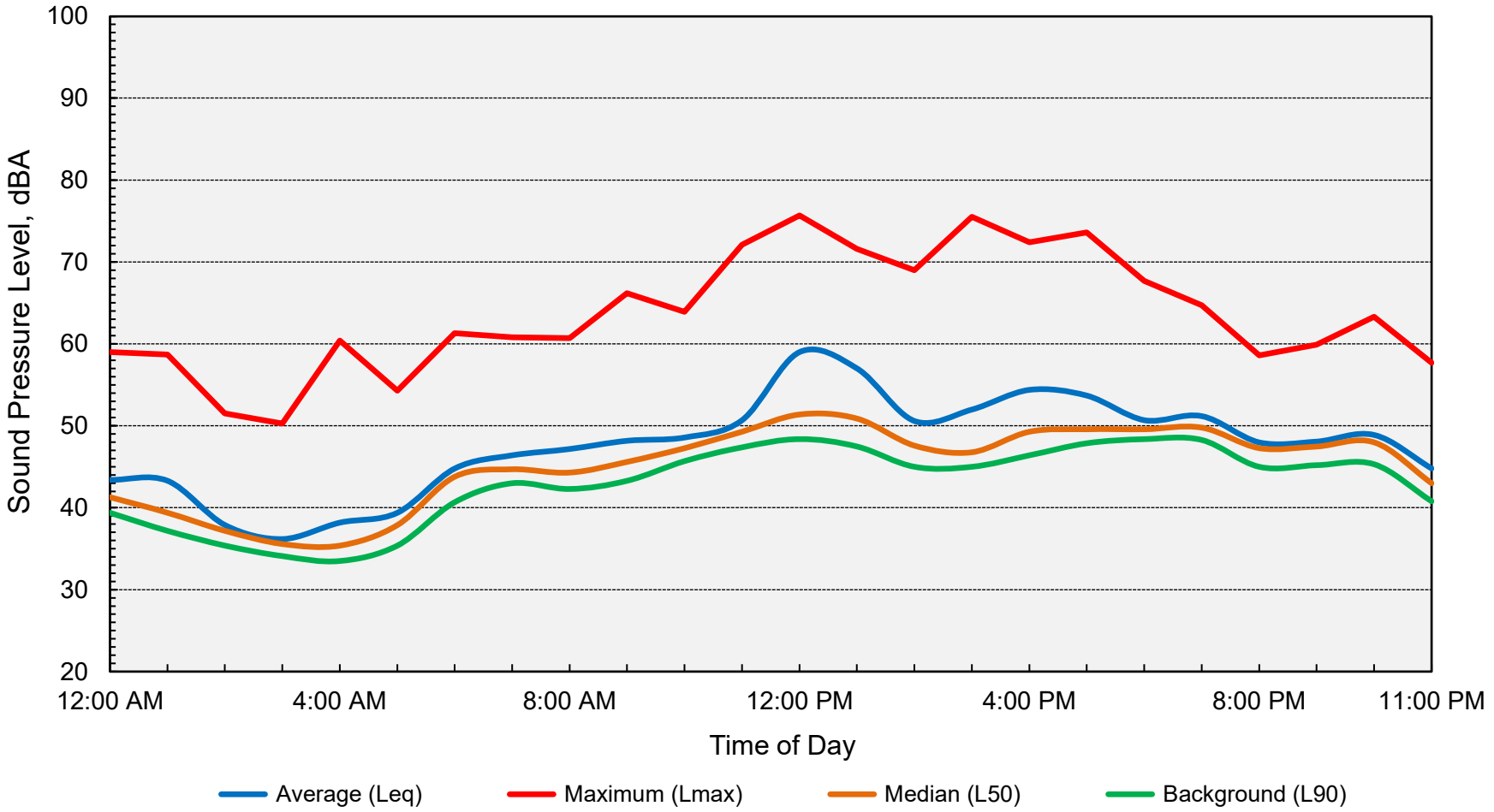
Appendix D-4
Long-Term Ambient Noise Monitoring Results - Site 2
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023



Computed DNL = 51 dB

BOLLARD
Acoustical Consultants

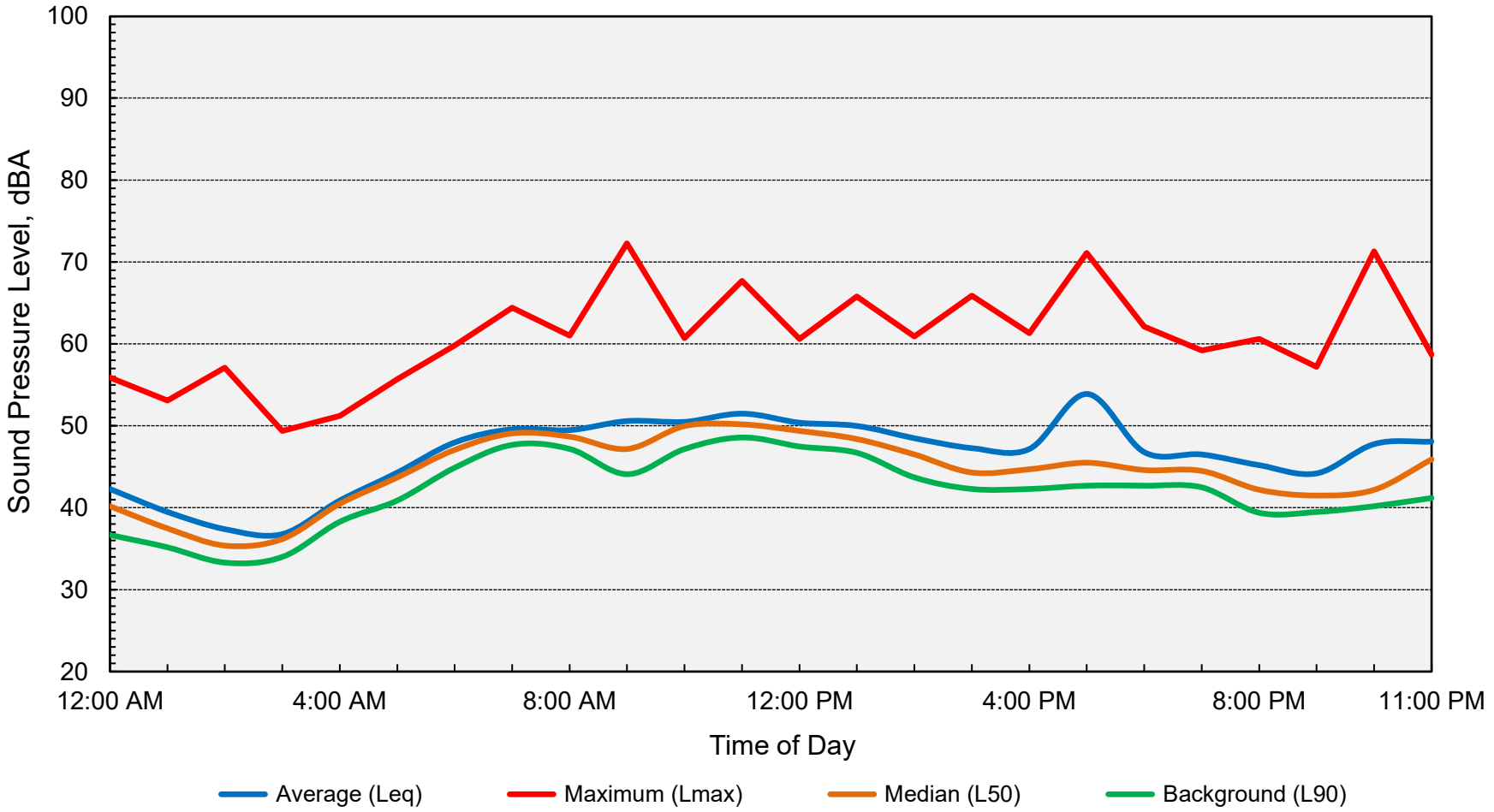
Appendix D-5
Long-Term Ambient Noise Monitoring Results - Site 2
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023



Computed DNL = 53 dB

BOLLARD
Acoustical Consultants

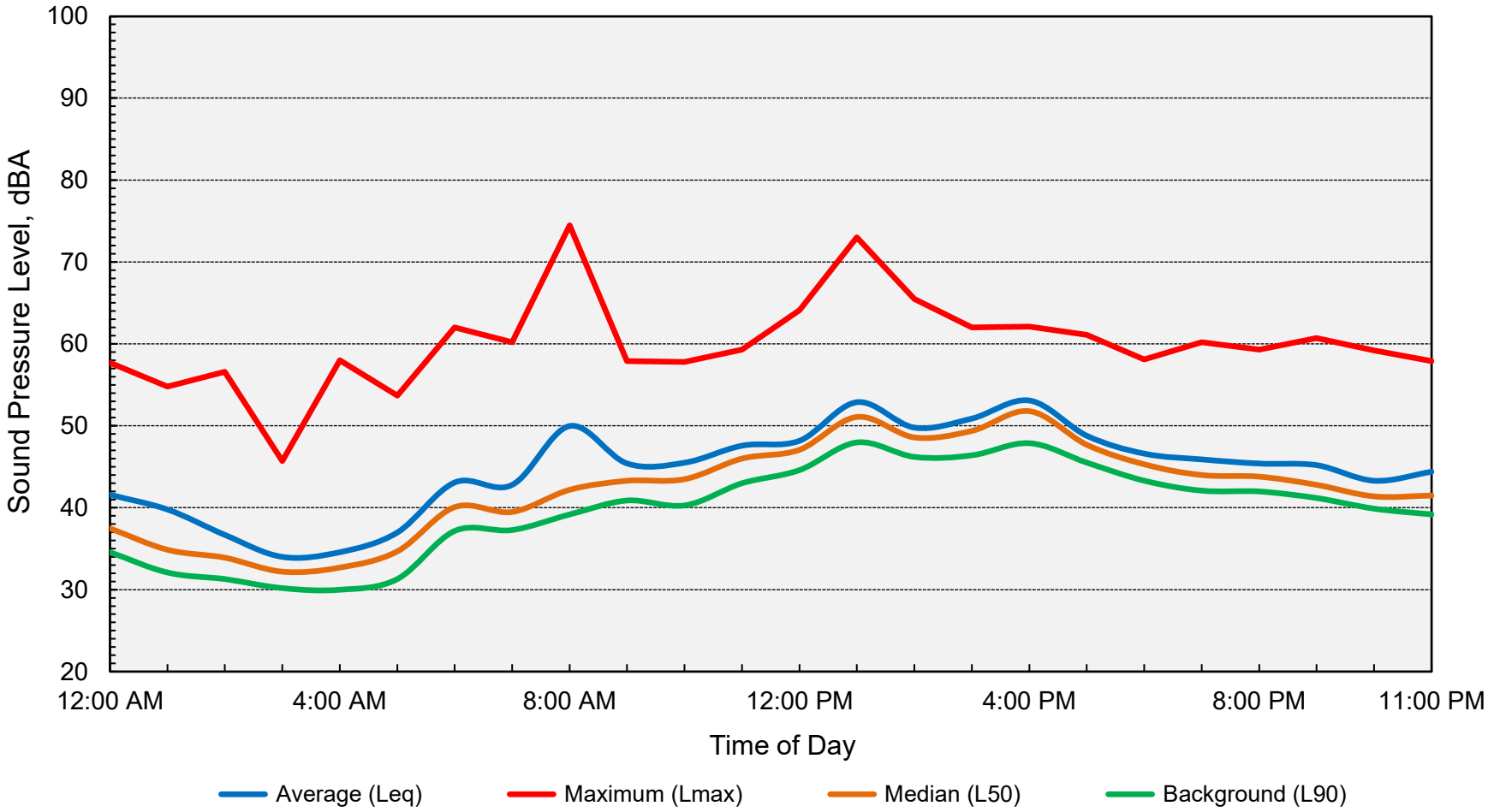
Appendix D-6
Long-Term Ambient Noise Monitoring Results - Site 2
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023



Computed DNL = 52 dB

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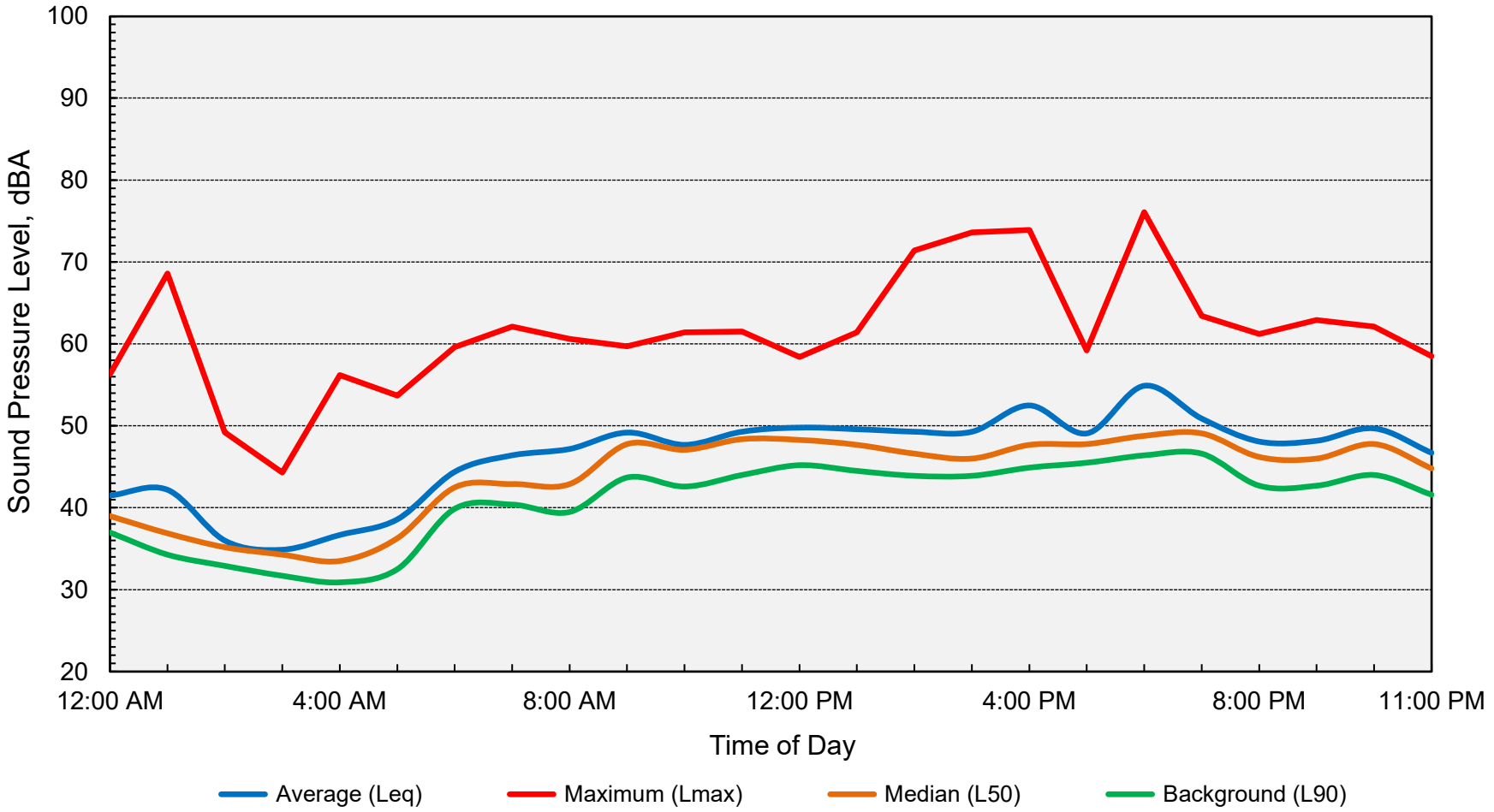
Appendix D-7
Long-Term Ambient Noise Monitoring Results - Site 3
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023



Computed DNL = 50 dB

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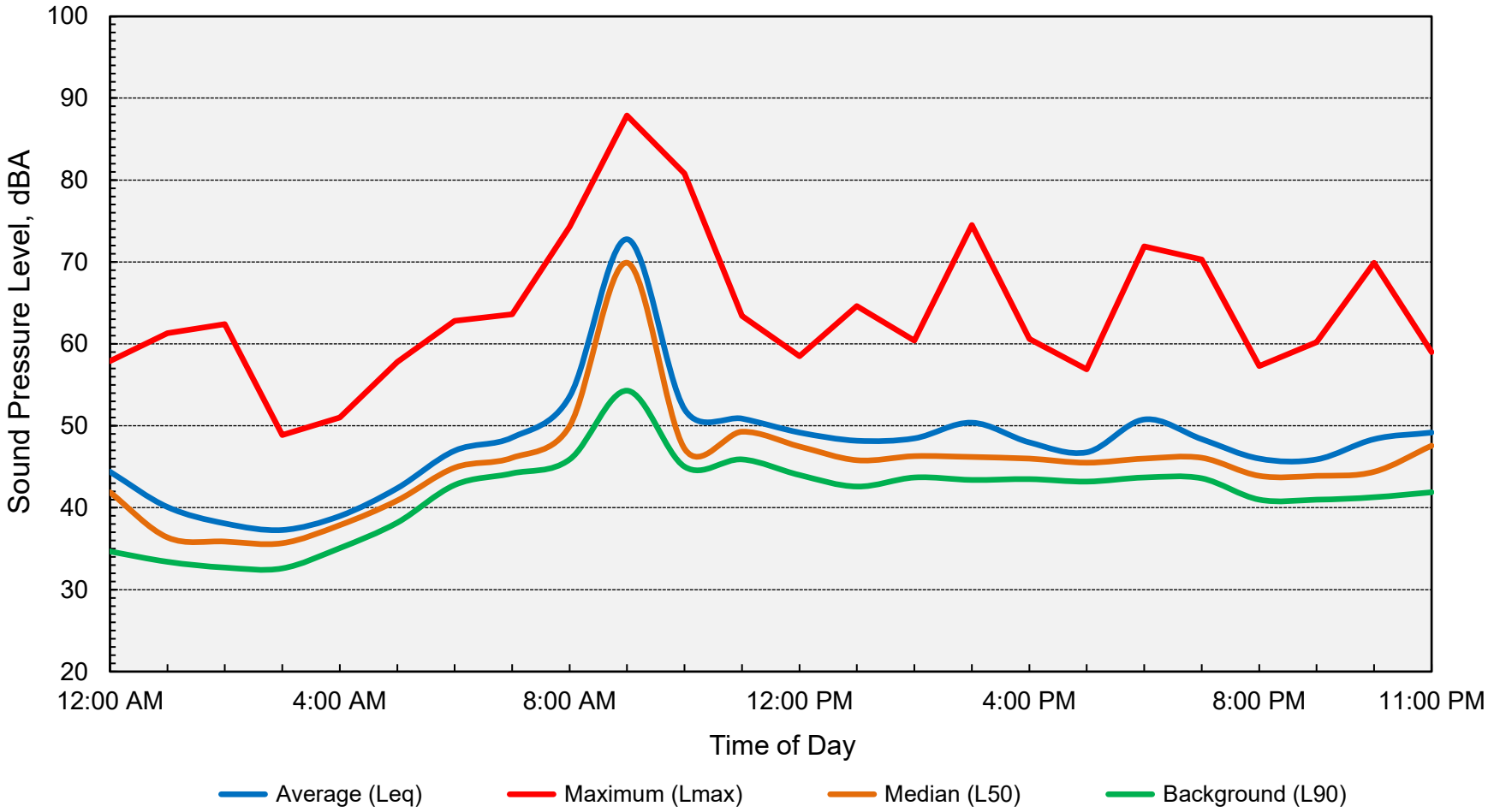
Appendix D-8
Long-Term Ambient Noise Monitoring Results - Site 3
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023



Computed DNL = 52 dB

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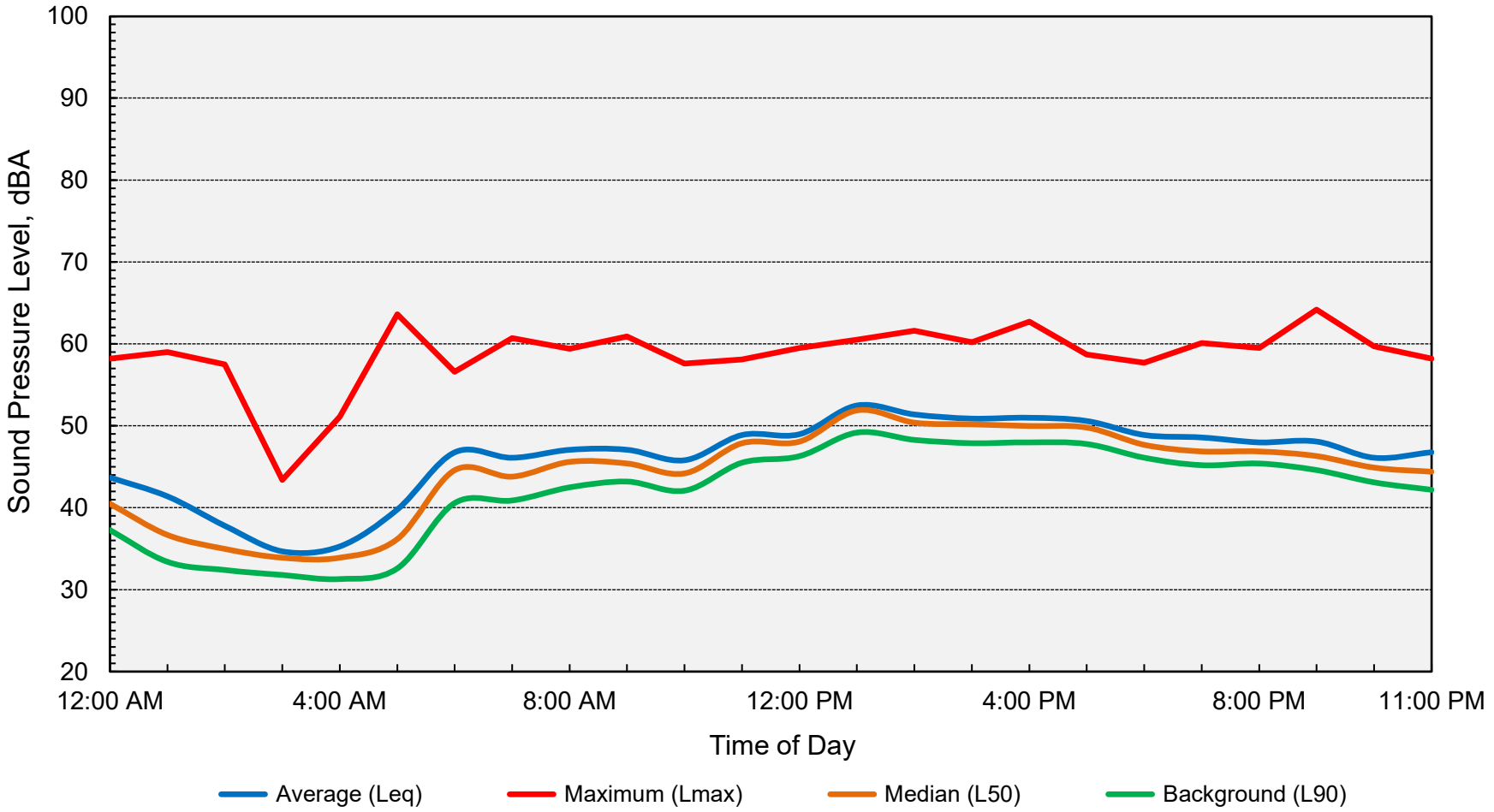
Appendix D-9
Long-Term Ambient Noise Monitoring Results - Site 3
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023



Computed DNL = 60 dB

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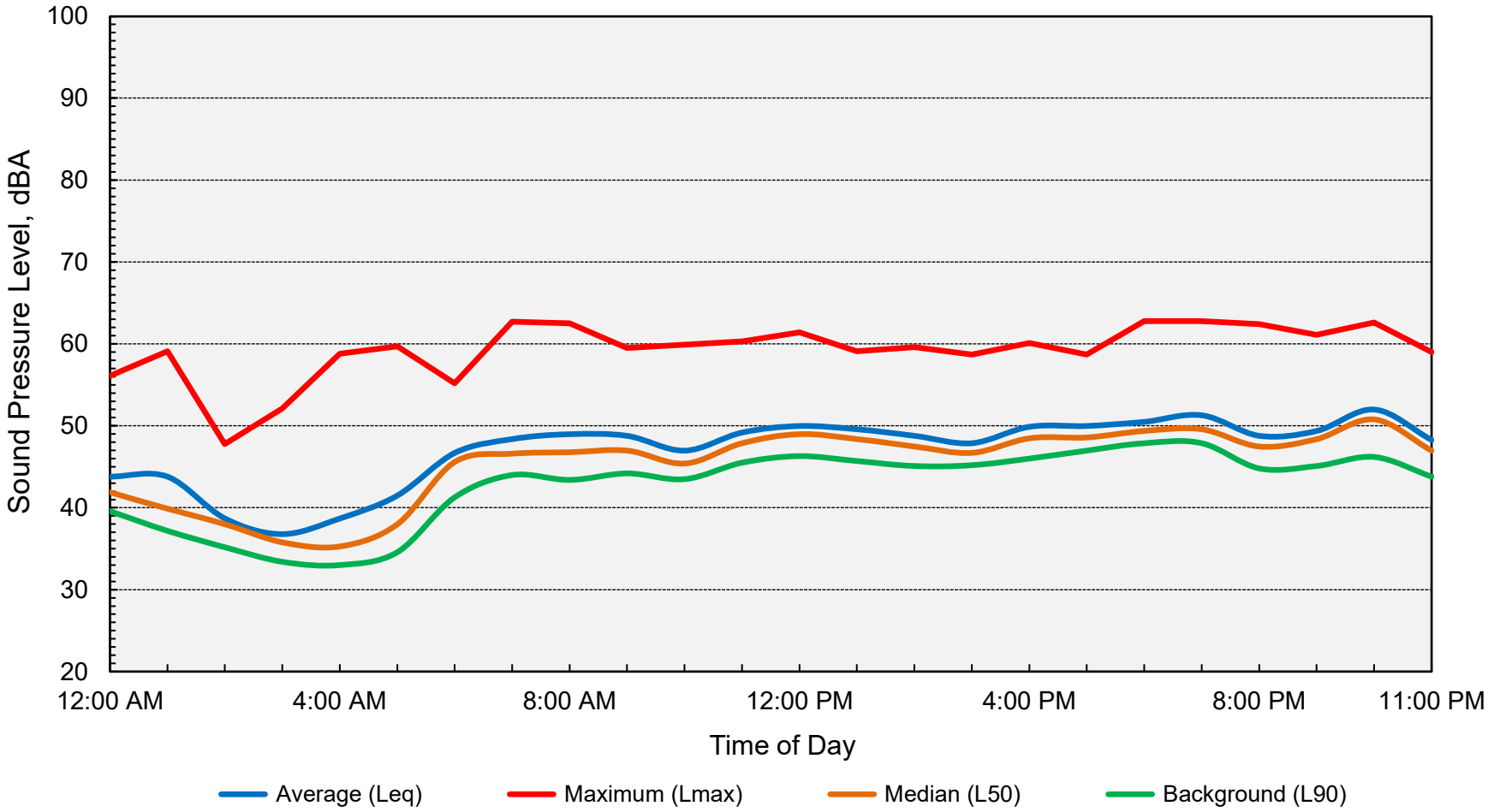
Appendix D-10
Long-Term Ambient Noise Monitoring Results - Site 4
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Saturday, April 15, 2023



Computed DNL = 51 dB

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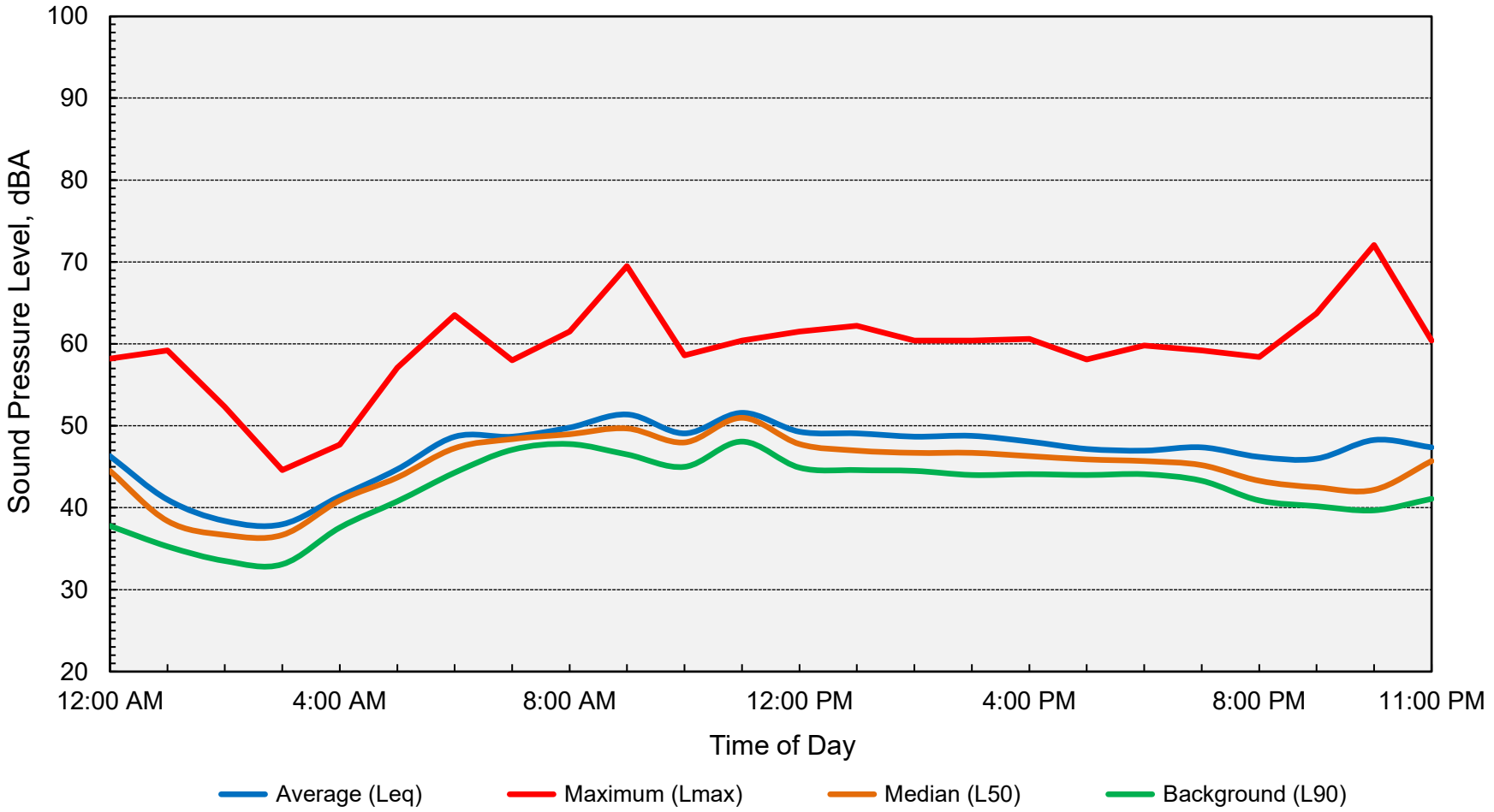
Appendix D-11
Long-Term Ambient Noise Monitoring Results - Site 4
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Sunday, April 16, 2023



Computed DNL = 53 dB

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Appendix D-12
Long-Term Ambient Noise Monitoring Results - Site 4
Crestmoor, 300 Piedmont Avenue Development Vicinity - San Bruno, California
Monday, April 17, 2023



Computed DNL = 52 dB

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Appendix B-1
FHWA Highway Traffic Noise Prediction Model Inputs
300 Piedmont Avenue
File Name: FHWA Segments - Existing
Run Date: 8/10/2023

#	Roadway	Description	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed [MPH]	Distance [ft]	Offset [dB]
1	Skyline Blvd	North of San Bruno Ave W	20,130	88	12	2.0	2.0	55	125	0
2	Skyline Blvd	South of San Bruno Ave W	16,050	88	12	2.0	2.0	55	120	0
3	San Bruno Ave W	East of Skyline Blvd	9,840	88	12	2.0	2.0	45	75	0
4	San Bruno Ave	West of Interstate 280	15,200	88	12	2.0	2.0	45	90	0
5	San Bruno Ave	East of Interstate 280	19,050	88	12	2.0	2.0	40	60	0
6	Cunningham Way	South of Jenevin Ave	4,610	80	20	2.0	2.0	30	50	0
7	Jenevein Ave	East of Cunningham Way	5,220	80	20	2.0	2.0	30	45	0
8	Jenevein Ave	West of Cunningham Way	3,890	80	20	2.0	2.0	30	45	0
9	Courtland Dr	Whitman Way to Rosewood Dr	2,020	80	20	2.0	1.0	30	40	0
10	Whitman Way	East of Courtland Dr	3,400	80	20	2.0	1.0	30	50	0
11	Whitman Way	West of Courtland Dr	1,820	80	20	2.0	1.0	30	40	0
12	Courtland Dr	South of Rosewood Dr	1,430	80	20	2.0	1.0	30	45	0
13	Rosewood Dr	West of Courtland Dr	630	87	13	2.0	1.0	30	55	0
14	Madison Ave	North of Piedmont Ave	180	88	12	2.0	1.0	30	60	0
15	Courtland Dr	East of Madison Ave	280	88	12	2.0	1.0	30	40	0
16	Piedmont Ave	Madison Ave to Crestmoor Dr	400	88	12	2.0	1.0	30	50	0
17	Crestmoor Dr	North of Piedmont Ave	1,400	88	12	2.0	1.0	30	55	0
18	Crestmoor Dr	South of Piedmont Ave	1,300	88	12	2.0	1.0	30	35	0

Appendix E-2
FHWA Highway Traffic Noise Prediction Model Inputs
300 Piedmont Avenue
File Name: FHWA Segments - Existing+Project
Run Date: 8/10/2023

#	Roadway	Description	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed [MPH]	Distance [ft]	Offset [dB]
1	Skyline Blvd	North of San Bruno Ave W	20,350	88	12	2.0	2.0	55	125	0
2	Skyline Blvd	South of San Bruno Ave W	16,060	88	12	2.0	2.0	55	120	0
3	San Bruno Ave W	East of Skyline Blvd	10,070	88	12	2.0	2.0	45	75	0
4	San Bruno Ave	West of Interstate 280	16,060	88	12	2.0	2.0	45	90	0
5	San Bruno Ave	East of Interstate 280	19,460	88	12	2.0	2.0	40	60	0
6	Cunningham Way	South of Jenevin Ave	4,770	80	20	2.0	2.0	30	50	0
7	Jenevein Ave	East of Cunningham Way	5,320	80	20	2.0	2.0	30	45	0
8	Jenevein Ave	West of Cunningham Way	4,150	80	20	2.0	2.0	30	45	0
9	Courtland Dr	Whitman Way to Rosewood Dr	3,090	80	20	2.0	1.0	30	40	0
10	Whitman Way	East of Courtland Dr	3,990	80	20	2.0	1.0	30	50	0
11	Whitman Way	West of Courtland Dr	2,300	80	20	2.0	1.0	30	40	0
12	Courtland Dr	South of Rosewood Dr	2,520	80	20	2.0	1.0	30	45	0
13	Rosewood Dr	West of Courtland Dr	650	87	13	2.0	1.0	30	55	0
14	Madison Ave	North of Piedmont Ave	210	88	12	2.0	1.0	30	60	0
15	Courtland Dr	East of Madison Ave	730	88	12	2.0	1.0	30	40	0
16	Piedmont Ave	Madison Ave to Crestmoor Dr	840	88	12	2.0	1.0	30	50	0
17	Crestmoor Dr	North of Piedmont Ave	1,760	88	12	2.0	1.0	30	55	0
18	Crestmoor Dr	South of Piedmont Ave	1,380	88	12	2.0	1.0	30	35	0

24AAA5
Single–Stage Air Conditioner with Puron® Refrigerant
1–1/2 To 5 Tons

Carrier
turn to the experts

Product Data



Puron

Comfort SERIES

INDUSTRY LEADING FEATURES / BENEFITS

Efficiency

- 14.0 SEER / 11.7 – 12.2 EER (based on tested combination)
- Microtube Technology™ refrigeration system

Reliability

- Puron® refrigerant
- Scroll compressor
- Internal pressure relief valve
- Internal thermal overload
- Filter drier

Durability

WeatherArmor™ protection package:

- Solid, durable sheet metal construction
- Dense wire coil guard

Applications

- Long–line – up to 250 feet (76.20 m) total equivalent length, up to 200 feet (60.96 m) condenser above evaporator, or up to 80 ft. (24.38 m) evaporator above condenser (See Longline Guide for more information.)
- Low ambient (down to –20°F/–28.9°C) with accessory kit

NOTE: Ratings contained in this document are subject to change at any time. Always refer to the AHRI directory (www.ahridirectory.org) for the most up–to–date ratings information.

Appendix F-2

ELECTRICAL DATA

UNIT SIZE – SERIES	V/PH	OPER VOLTS*		COMPR		FAN	MCA	MAX FUSE† or CKT BRK AMPS
		MAX	MIN	LRA	RLA	FLA		
18–30	208/230/1–60	253	197	47.5	9.0	0.40	11.7	20
24–30				62.9	10.9	0.50	14.1	20
30–30				67.8	12.8	0.75	16.8	25
36–30				79.0	13.6	1.10	18.1	30
42–30				109.0	16.7	1.40	22.3	35
48–30				105.7	15.6	1.40	20.9	35
60–30				127.1	20.8	1.52	27.5	40

* Permissible limits of the voltage range at which the unit will operate satisfactorily

† Time–Delay fuse.

FLA – Full Load Amps
LRA – Locked Rotor Amps
MCA – Minimum Circuit Amps
RLA – Rated Load Amps
NOTE: Control circuit is 24V on all units and requires external power source. Copper wire must be used from service disconnect to unit. All motors/compressors contain internal overload protection.

Complies with 2010 requirements of ASHRAE Standards 90.1

A–WEIGHTED SOUND POWER (dBA)

UNIT SIZE – SERIES	Standard Rating (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18–30	75	46.0	55.0	59.5	64.0	60.5	54.5	48.5
24–30	71	50.5	53.5	58.5	60.5	60.0	56.5	52.5
30–30	73	49.5	56.0	62.5	64.0	60.5	57.5	53.5
36–30	75	49.0	57.0	62.5	66.0	61.0	58.5	52.0
42–30	75	52.5	63.0	64.0	63.0	62.0	58.0	52.0
48–30	76	53.0	61.0	64.0	65.5	62.0	59.5	50.5
60–30	75	53.5	57.0	62.5	63.5	61.5	57.5	51.0

NOTE: Tested in compliance with AHRI 270–1995 (not listed with AHRI)

A–WEIGHTED SOUND POWER (dBA) WITH SOUND SHIELD

UNIT SIZE – SERIES	Standard Rating (dBA)	TYPICAL OCTAVE BAND SPECTRUM (dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18–30	75	46.5	55.5	59.5	63.5	60.0	54.0	47.0
24–30	71	47.5	53.5	58.0	59.5	60.0	55.5	49.0
30–30	72	49.0	56.5	61.5	62.5	60.0	57.0	52.0
36–30	73	49.5	57.0	62.0	64.0	60.0	58.0	51.0
42–30	74	53.5	64.0	64.0	62.5	61.0	56.5	50.5
48–30	73	54.5	61.0	63.5	62.5	60.0	56.5	47.5
60–30	73	53.5	59.0	63.0	62.5	59.5	56.0	48.0

NOTE: Tested in compliance with AHRI 270–1995 (not listed with AHRI)

METERING DEVICE

UNIT SIZE – SERIES	INDOOOR	REQUIRED SUBCOOLING °F (°C)
18–30	TXV*	13 (7.22)
24–30		10 (5.56)
30–30		12 (6.67)
36–30		11 (6.11)
42–30		11 (6.11)
48–30		11 (6.11)
60–30		13 (7.22)

* TXV must be ordered separately when indoor coil is not equipped with a TXV. TXV must be hard–shutoff type.

Appendix G

Transportation

FEHR PEERS

Memorandum

Date: August 15, 2023

To: Kristi Black, ICF

From: Taylor McAdam and Emily Chen, Fehr & Peers

Subject: 300 Piedmont Avenue Transportation Demand Management Plan

SF23-1291

This memorandum documents the vehicle miles traveled (VMT) reduction strategies proposed as part of a transportation demand management (TDM) plan for the 300 Piedmont Avenue redevelopment project (Project) in the City of San Bruno.

Background

The Project proposes to redevelop the former Crestmoor High School site into two single-family home neighborhoods with modifications to the adjacent recreation/open space area. The two neighborhoods will have a total of 155 single-family dwelling units. Each single-family dwelling unit will have 4 bedrooms and a two-car garage with a driveway apron that can fit an additional two cars. The recreation/open space area today serves primarily as soccer fields for two youth soccer leagues. Their games are concentrated in the spring and fall seasons with significantly more activity in the fall season. The proposed modifications would modestly reduce the total acreage of recreation area but would program sports fields and other types of amenities for a similar level of peak usage and daily activity as is present on the site today. The design for the recreation fields is conceptual and could still change as the Project progresses. The VMT analysis covers a similar level of activity as is present today, which represents the maximum level of recreation activity expected.

Based on the VMT analysis prepared for the EIR, the Project would result in a significant impact to VMT. The Bay Area regional average VMT per resident is 14.6; the threshold for significance is defined as 15 percent below this value, or 12.4. The project is expected to exceed the threshold value, resulting in a significant impact to VMT. Under existing plus project conditions, the project produces approximately 14.7 average VMT per resident. This accounts for the slight reduction in VMT achieved by including affordable housing units as part of the Project. The project would

need to reduce project-generated VMT by approximately 16 percent under existing plus project conditions to reduce its VMT impact to a less-than-significant level.

TDM Strategies

TDM strategies aim to discourage single-occupancy vehicle trips and encourage the shift to more sustainable travel modes through education and incentives. This TDM Plan discusses potential VMT reduction strategies to reduce the project VMT impact. However, the low density, single-family residential nature of this project in a vehicle-oriented suburban setting with limited transit service poses obstacles to implementing effective VMT reduction strategies. There are a few strategies that can be implemented to reduce project-generated VMT, but the project as currently described is not expected to feasibly implement strategies at a level which reduces its VMT impact to a less-than-significant level.

Each strategy's description, feasibility, and estimated VMT reduction are discussed below.

Limit Residential Parking Supply

Description: Decrease project parking supply to rates lower than the standard parking minimums where allowable in the City Municipal Code.

Feasibility: The project is required to provide a minimum of two parking spaces per residential unit. The project proposes to provide double the minimum required parking supply at a rate of four parking spaces per residential unit (two-car garage and driveway apron that fits two cars). To reduce the project's parking supply, the developer would need to request approval from the City Planning Commission and update the plans to reflect the new proposed reduced total parking supply.

Estimated VMT Reduction: If on-street parking were not readily available, a 10 percent and 50 percent reduction in the parking supply could reduce the project's VMT by about 1.5 percent to 7 percent, respectively. Because on-street parking is easily accessible, however, the effectiveness of this strategy would be minimal.

Trip Reduction Marketing

Description: Discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as carpooling, taking transit, walking, and biking, thereby reducing VMT and GHG emissions. Market information and resources such as carpool matching services, transit services and discount programs, and alternative travel mode options. This can be executed by email blasts, community bulletin boards physical or digital), mailed flyers, or incentives.

Feasibility: The neighborhood HOA would need a TDM Coordinator in charge of regularly sharing information and resources with residents.

Estimated VMT Reduction: Maximum 4 percent reduction.

Other strategies such as electric bike share, car share, and unbundled parking were considered for this site, but were deemed infeasible for single-family homes. Many TDM strategies are only applicable at higher densities and when a site has shared facilities like garages, bike rooms, community rooms, etc.

The Project sponsor and home owners association (HOA) are ultimately responsible for selecting the right mix of TDM strategies for the Project. The strategies described above are the options thought to be the most promising for this particular site, but many more strategies could be explored. Potential strategies to explore in the future include:

- E-bike subsidies
- Transit subsidies
- Work carpool matching program
- School pool matching program

TDM Implementation

Two fixed elements of TDM Plan implementation are the presence of a TDM coordinator and commitment to monitoring and reporting.

TDM Coordinator

The HOA will need to assign a staff person responsibility for TDM implementation, coordination with the City, and monitoring and reporting.

Monitoring and Reporting

The required residential TDM Plan will include annual monitoring and reporting requirements completed by a neutral third party on the effectiveness of the TDM program for the first five years after full site buildout. Annual reporting requirements include information on the TDM marketing program, site occupancy, resident mode share, work-from-home rates, and use of alternative modes. For the first year after full occupancy, the monitoring report must also include a 24-hour screenline vehicle count across all the residential neighborhood street gateways. This count shall be compared to the trip generation estimates prepared as part of the project EIR and will serve as a guidepost for compliance with the four percent reduction target.

The HOA may need to supplement the marketing program with other measures such as carpool/school pool matching or an e-bike subsidy program to improve mode shift if initial

monitoring results show limited usage of alternative modes and higher than expected trip counts. The HOA TDM coordinator shall be required to review annual monitoring results with City staff to detail next steps to achieve the expected TDM reduction.

VMT Mitigation Program Alternative

While not currently available as a mitigation option, the City of San Bruno is exploring options to establish a VMT mitigation fee, bank, or exchange program that would allow development projects to offset their VMT impacts by contributing money into a citywide program to fund off-site VMT-reducing projects or programs (such as dedicated bike lanes or community shuttles). The financial contribution would be based on the difference between the project's estimated VMT and the VMT significance threshold. If such a program were in place at the time of project opening, the project could financially contribute to the mitigation program in lieu of or in addition to implementation of a TDM program.

C/CAG VMT Estimation Tool Report

Project Details

Timestamp of Analysis: June 02, 2023, 10:57:17 AM

Project Name: 300 Piedmont Avenue

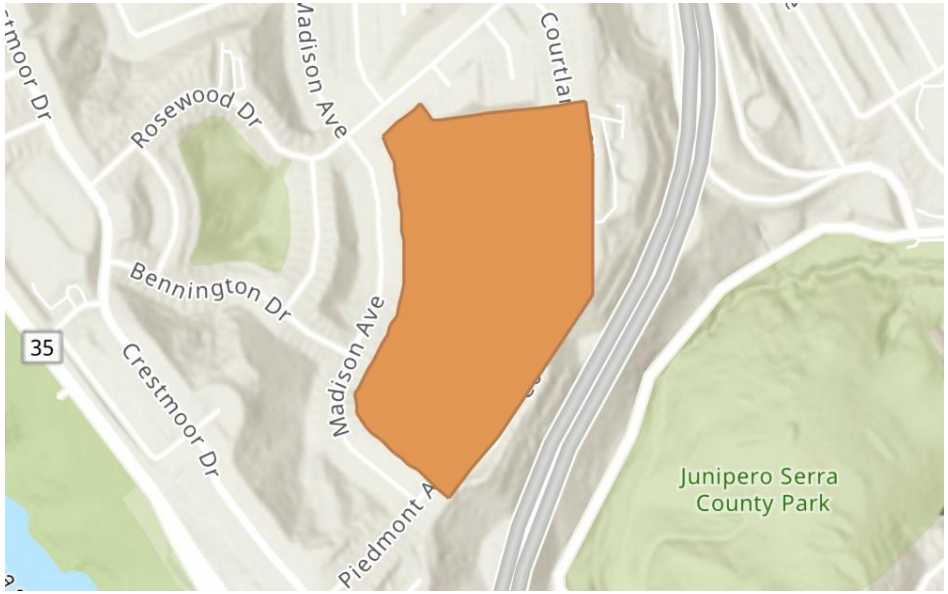
Project Description: Redevelop Crestmoor High School to two single-family residential neighborhoods.

Project Location

jurisdiction:
San Bruno

apn	TAZ
019170020	1933

Inside a TPA?
No (Fail)



Analysis Details

Data Version: C/CAG Travel Model

Analysis Methodology: TAZ

Baseline Year: 2023

Project Land Use

Residential:

Single Family DU:	155
Multifamily DU:	
Total DUs:	155

Non-Residential:

Office KSF:

Local Serving Retail KSF:

Industrial KSF:

Residential Affordability (percent of all units):

Extremely Low Income:	0 %
Very Low Income:	0 %
Low Income:	0 %

Parking:

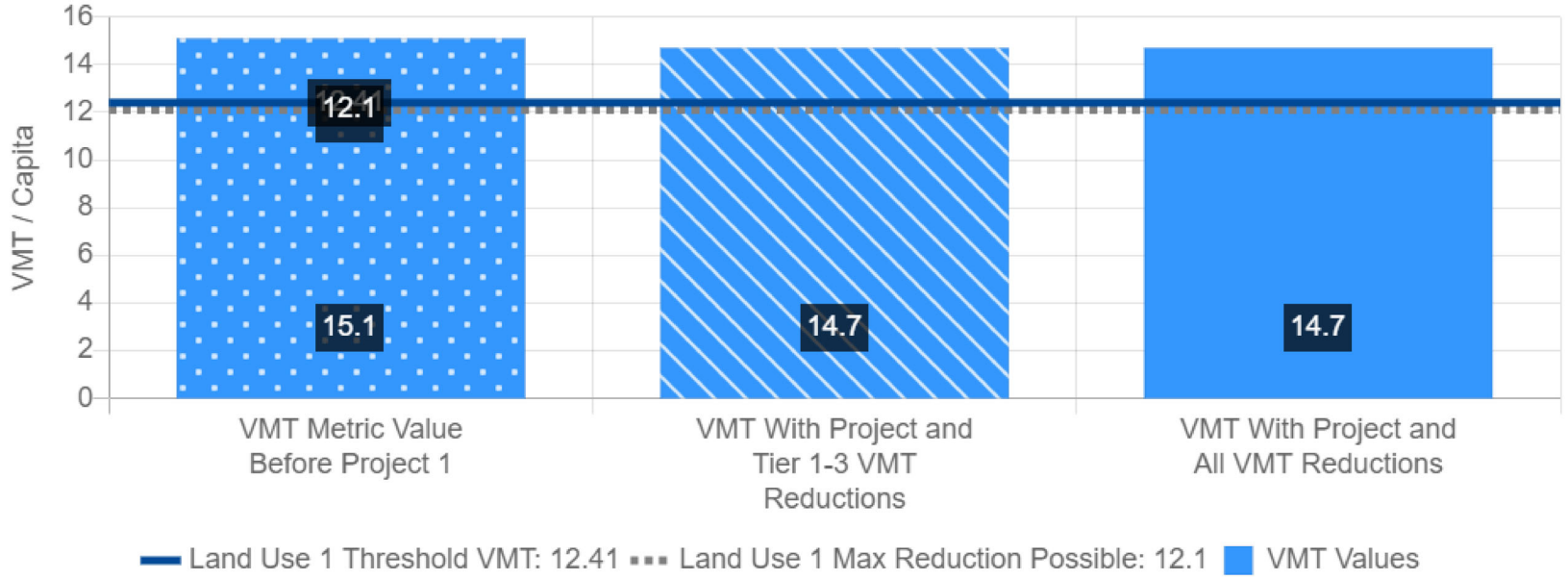
Motor Vehicle Parking:

Bicycle Parking:

Residential Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Residential
VMT Without Project 1:	Home-Based VMT per Resident
VMT Baseline Description 1:	Bay Area Regional Average
VMT Baseline Value 1:	14.6
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	15.1	14.7	14.7
Low VMT Screening Analysis	No (Fail)	No (Fail)	No (Fail)



Tier 1 Project Characteristics

PC01 Increase Residential Density

Existing Residential Density:	10.89
With Project Residential Density:	11.59

PC03 Affordable Housing

Tier 4 TDM Programs

TP16 Unbundle Parking Costs from Property Cost (On Site Parking)



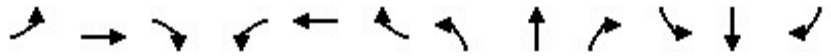
Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	2	98	403	842	190	293	475
Future Volume (veh/h)	2	98	403	842	190	293	475
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No			No
Adj Sat Flow, veh/h/ln		1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h		102	366	877	198	305	495
Peak Hour Factor		0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %		1	1	1	1	1	1
Cap, veh/h		358	613	962	815	331	1366
Arrive On Green		0.20	0.20	0.51	0.51	0.18	0.72
Sat Flow, veh/h		1795	1598	1885	1596	1795	1885
Grp Volume(v), veh/h		102	366	877	198	305	495
Grp Sat Flow(s),veh/h/ln		1795	1598	1885	1596	1795	1885
Q Serve(g_s), s		6.4	24.4	56.7	9.2	22.2	13.1
Cycle Q Clear(g_c), s		6.4	24.4	56.7	9.2	22.2	13.1
Prop In Lane		1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h		358	613	962	815	331	1366
V/C Ratio(X)		0.28	0.60	0.91	0.24	0.92	0.36
Avail Cap(c_a), veh/h		377	630	962	815	458	1366
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		45.3	32.8	29.9	18.2	53.4	6.8
Incr Delay (d2), s/veh		0.2	1.0	14.2	0.7	16.8	0.7
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.9	0.2	27.3	3.4	11.2	4.6
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		45.4	33.8	44.0	18.9	70.2	7.6
LnGrp LOS		D	C	D	B	E	A
Approach Vol, veh/h		468		1075			800
Approach Delay, s/veh		36.3		39.4			31.5
Approach LOS		D		D			C

Timer - Assigned Phs	2		4	5	6	
Phs Duration (G+Y+Rc), s	102.2		31.0	28.5	73.7	
Change Period (Y+Rc), s	5.7		4.4	4.0	5.7	
Max Green Setting (Gmax), s	78.0		28.0	34.0	68.0	
Max Q Clear Time (g_c+I1), s	15.1		26.4	24.2	58.7	
Green Ext Time (p_c), s	4.7		0.2	0.3	5.5	

Intersection Summary		
HCM 6th Ctrl Delay		36.1
HCM 6th LOS		D

Notes

User approved ignoring U-Turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	508	161	251	614	0	0	0	0	177	72	237
Future Volume (veh/h)	0	508	161	251	614	0	0	0	0	177	72	237
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1885	1885	1885
Adj Flow Rate, veh/h	0	535	0	264	646	0				208	116	94
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	1	1	0				1	1	1
Cap, veh/h	0	1944		1294	2882	0				326	171	145
Arrive On Green	0.00	0.38	0.00	0.74	1.00	0.00				0.09	0.09	0.09
Sat Flow, veh/h	0	5316	1598	3483	3676	0				3591	1885	1598
Grp Volume(v), veh/h	0	535	0	264	646	0				208	116	94
Grp Sat Flow(s),veh/h/ln	0	1716	1598	1742	1791	0				1795	1885	1598
Q Serve(g_s), s	0.0	6.5	0.0	2.1	0.0	0.0				5.0	5.4	5.1
Cycle Q Clear(g_c), s	0.0	6.5	0.0	2.1	0.0	0.0				5.0	5.4	5.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1944		1294	2882	0				326	171	145
V/C Ratio(X)	0.00	0.28		0.20	0.22	0.00				0.64	0.68	0.65
Avail Cap(c_a), veh/h	0	1944		1294	2882	0				862	452	383
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.94	0.94	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	19.4	0.0	7.5	0.0	0.0				39.5	39.6	39.5
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.2	0.0				0.8	1.7	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.0	0.7	0.1	0.0				2.2	2.5	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.8	0.0	7.6	0.2	0.0				40.3	41.4	41.3
LnGrp LOS	A	B		A	A	A				D	D	D
Approach Vol, veh/h		535			910						418	
Approach Delay, s/veh		19.8			2.3						40.8	
Approach LOS		B			A						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	18.4	39.0		12.6		77.4
Change Period (Y+Rc), s	5.0	* 5		4.4		5.0
Max Green Setting (Gmax), s	21.5	* 34		21.6		59.0
Max Q Clear Time (g_c+I1), s	4.1	8.5		7.4		2.0
Green Ext Time (p_c), s	0.4	4.9		0.8		7.4

Intersection Summary	
HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	1	147	537	0	0	736	424	128	170	214	0	0	0
Future Volume (veh/h)	1	147	537	0	0	736	424	128	170	214	0	0	0
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach			No			No			No				
Adj Sat Flow, veh/h/ln		1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h		152	554	0	0	759	0	132	196	198			
Peak Hour Factor		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %		2	2	0	0	2	2	2	2	2			
Cap, veh/h		846	2607	0	0	1540		277	290	246			
Arrive On Green		0.49	1.00	0.00	0.00	0.43	0.00	0.16	0.16	0.16			
Sat Flow, veh/h		3456	3647	0	0	3647	1585	1781	1870	1585			
Grp Volume(v), veh/h		152	554	0	0	759	0	132	196	198			
Grp Sat Flow(s),veh/h/ln		1728	1777	0	0	1777	1585	1781	1870	1585			
Q Serve(g_s), s		2.2	0.0	0.0	0.0	13.9	0.0	6.1	8.9	10.9			
Cycle Q Clear(g_c), s		2.2	0.0	0.0	0.0	13.9	0.0	6.1	8.9	10.9			
Prop In Lane		1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h		846	2607	0	0	1540		277	290	246			
V/C Ratio(X)		0.18	0.21	0.00	0.00	0.49		0.48	0.68	0.80			
Avail Cap(c_a), veh/h		846	2607	0	0	1540		614	644	546			
HCM Platoon Ratio		2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)		0.97	0.97	0.00	0.00	1.00	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh		17.9	0.0	0.0	0.0	18.4	0.0	34.7	35.9	36.7			
Incr Delay (d2), s/veh		0.0	0.2	0.0	0.0	1.1	0.0	0.5	1.0	2.4			
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln		0.8	0.1	0.0	0.0	5.6	0.0	2.6	4.0	4.2			
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh		18.0	0.2	0.0	0.0	19.5	0.0	35.2	36.9	39.1			
LnGrp LOS		B	A	A	A	B		D	D	D			
Approach Vol, veh/h			706			759			526				
Approach Delay, s/veh			4.0			19.5			37.3				
Approach LOS			A			B			D				

Timer - Assigned Phs	2			5	6		8					
Phs Duration (G+Y+Rc), s	71.0			27.0	44.0		19.0					
Change Period (Y+Rc), s	5.0			5.0	* 5		5.0					
Max Green Setting (Gmax), s	49.0			6.0	* 39		31.0					
Max Q Clear Time (g_c+I1), s	2.0			4.2	15.9		12.9					
Green Ext Time (p_c), s	5.8			0.0	7.3		1.1					

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	11.1
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	99	44	113	126	120	184
Future Vol, veh/h	99	44	113	126	120	184
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	132	59	151	168	160	245
Number of Lanes	1	1	0	2	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	10	11.6	11.2
HCM LOS	A	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	73%	0%
Vol Thru, %	0%	0%	100%	0%	27%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	184	99	44	155	84
LT Vol	120	0	0	0	113	0
Through Vol	0	0	99	0	42	84
RT Vol	0	184	0	44	0	0
Lane Flow Rate	160	245	132	59	207	112
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.286	0.356	0.224	0.088	0.36	0.184
Departure Headway (Hd)	6.434	5.225	6.103	5.392	6.278	5.909
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	560	689	589	665	575	608
Service Time	4.16	2.951	3.834	3.122	4.004	3.635
HCM Lane V/C Ratio	0.286	0.356	0.224	0.089	0.36	0.184
HCM Control Delay	11.7	10.8	10.6	8.6	12.5	10
HCM Lane LOS	B	B	B	A	B	A
HCM 95th-tile Q	1.2	1.6	0.9	0.3	1.6	0.7

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	53	17	109	107	5	72
Future Vol, veh/h	53	17	109	107	5	72
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	56	18	115	113	5	76
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	7.6	8.9	7.8
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	50%
Vol Thru, %	0%	0%	76%	50%
Vol Right, %	0%	100%	24%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	72	70	216
LT Vol	5	0	0	109
Through Vol	0	0	53	107
RT Vol	0	72	17	0
Lane Flow Rate	5	76	74	227
Geometry Grp	7	7	2	2
Degree of Util (X)	0.008	0.095	0.086	0.267
Departure Headway (Hd)	5.71	4.504	4.213	4.231
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	630	800	854	839
Service Time	3.414	2.207	2.222	2.31
HCM Lane V/C Ratio	0.008	0.095	0.087	0.271
HCM Control Delay	8.5	7.7	7.6	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.3	0.3	1.1

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	2	3	48	91	31
Future Vol, veh/h	28	2	3	48	91	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	2	3	54	102	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	162	102	137	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	60	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	829	953	1447	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	963	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	827	953	1447	-	-	-
Mov Cap-2 Maneuver	827	-	-	-	-	-
Stage 1	920	-	-	-	-	-
Stage 2	963	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1447	-	834	-	-
HCM Lane V/C Ratio	0.002	-	0.04	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	6	7	8	13	3
Future Vol, veh/h	5	6	7	8	13	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	7	8	9	15	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	42	17	18	0	-	0
Stage 1	17	-	-	-	-	-
Stage 2	25	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	969	1062	1599	-	-	-
Stage 1	1006	-	-	-	-	-
Stage 2	998	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	964	1062	1599	-	-	-
Mov Cap-2 Maneuver	964	-	-	-	-	-
Stage 1	1001	-	-	-	-	-
Stage 2	998	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	3.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	1015	-	-
HCM Lane V/C Ratio	0.005	-	0.012	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	8	56	6	17	59
Future Vol, veh/h	9	8	56	6	17	59
Conflicting Peds, #/hr	6	0	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	9	63	7	19	66

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	179	69	0	0	72	0
Stage 1	69	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	811	994	-	-	1528	-
Stage 1	954	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	794	992	-	-	1525	-
Mov Cap-2 Maneuver	794	-	-	-	-	-
Stage 1	952	-	-	-	-	-
Stage 2	898	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	1.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	876	1525	-
HCM Lane V/C Ratio	-	-	0.022	0.013	-
HCM Control Delay (s)	-	-	9.2	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-



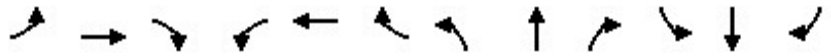
Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	2	98	414	842	191	304	475
Future Volume (veh/h)	2	98	414	842	191	304	475
Initial Q (Qb), veh		0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No		No			No
Adj Sat Flow, veh/h/ln		1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h		102	377	877	199	317	495
Peak Hour Factor		0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %		1	1	1	1	1	1
Cap, veh/h		364	628	947	802	342	1362
Arrive On Green		0.20	0.20	0.50	0.50	0.19	0.72
Sat Flow, veh/h		1795	1598	1885	1596	1795	1885
Grp Volume(v), veh/h		102	377	877	199	317	495
Grp Sat Flow(s),veh/h/ln		1795	1598	1885	1596	1795	1885
Q Serve(g_s), s		6.5	25.4	58.6	9.6	23.5	13.4
Cycle Q Clear(g_c), s		6.5	25.4	58.6	9.6	23.5	13.4
Prop In Lane		1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h		364	628	947	802	342	1362
V/C Ratio(X)		0.28	0.60	0.93	0.25	0.93	0.36
Avail Cap(c_a), veh/h		371	635	947	802	451	1362
HCM Platoon Ratio		1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		45.6	32.6	31.3	19.1	53.8	7.1
Incr Delay (d2), s/veh		0.2	1.1	16.0	0.7	19.1	0.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.9	0.2	28.7	3.6	12.1	4.7
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh		45.7	33.7	47.3	19.9	72.9	7.8
LnGrp LOS		D	C	D	B	E	A
Approach Vol, veh/h		479		1076			812
Approach Delay, s/veh		36.2		42.3			33.2
Approach LOS		D		D			C

Timer - Assigned Phs	2		4	5	6	
Phs Duration (G+Y+Rc), s	103.5		31.8	29.8	73.7	
Change Period (Y+Rc), s	5.7		4.4	4.0	5.7	
Max Green Setting (Gmax), s	78.0		28.0	34.0	68.0	
Max Q Clear Time (g_c+I1), s	15.4		27.4	25.5	60.6	
Green Ext Time (p_c), s	4.7		0.1	0.3	4.6	

Intersection Summary	
HCM 6th Ctrl Delay	37.9
HCM 6th LOS	D

Notes

User approved ignoring U-Turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	526	170	251	654	0	0	0	0	177	72	256
Future Volume (veh/h)	0	526	170	251	654	0	0	0	0	177	72	256
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1885	1885	1885	1885	0				1885	1885	1885
Adj Flow Rate, veh/h	0	554	0	264	688	0				210	123	108
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	1	1	0				1	1	1
Cap, veh/h	0	1944		1272	2860	0				349	183	155
Arrive On Green	0.00	0.38	0.00	0.73	1.00	0.00				0.10	0.10	0.10
Sat Flow, veh/h	0	5316	1598	3483	3676	0				3591	1885	1598
Grp Volume(v), veh/h	0	554	0	264	688	0				210	123	108
Grp Sat Flow(s),veh/h/ln	0	1716	1598	1742	1791	0				1795	1885	1598
Q Serve(g_s), s	0.0	6.8	0.0	2.2	0.0	0.0				5.0	5.7	5.9
Cycle Q Clear(g_c), s	0.0	6.8	0.0	2.2	0.0	0.0				5.0	5.7	5.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1944		1272	2860	0				349	183	155
V/C Ratio(X)	0.00	0.28		0.21	0.24	0.00				0.60	0.67	0.70
Avail Cap(c_a), veh/h	0	1944		1272	2860	0				862	452	383
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.93	0.93	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	19.5	0.0	8.0	0.0	0.0				39.0	39.2	39.3
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.2	0.0				0.6	1.6	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.6	0.0	0.7	0.1	0.0				2.2	2.6	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.9	0.0	8.0	0.2	0.0				39.6	40.8	41.4
LnGrp LOS	A	B		A	A	A				D	D	D
Approach Vol, veh/h		554			952						441	
Approach Delay, s/veh		19.9			2.4						40.4	
Approach LOS		B			A						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	17.9	39.0		13.1		76.9
Change Period (Y+Rc), s	5.0	* 5		4.4		5.0
Max Green Setting (Gmax), s	21.5	* 34		21.6		59.0
Max Q Clear Time (g_c+I1), s	4.2	8.8		7.9		2.0
Green Ext Time (p_c), s	0.4	5.1		0.9		8.0

Intersection Summary	
HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.



Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Volume (veh/h)	1	157	544	0	0	764	424	140	170	214	0	0	0
Future Volume (veh/h)	1	157	544	0	0	764	424	140	170	214	0	0	0
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach			No			No			No				
Adj Sat Flow, veh/h/ln		1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h		162	561	0	0	788	0	144	196	198			
Peak Hour Factor		0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %		2	2	0	0	2	2	2	2	2			
Cap, veh/h		845	2607	0	0	1540		277	291	246			
Arrive On Green		0.49	1.00	0.00	0.00	0.43	0.00	0.16	0.16	0.16			
Sat Flow, veh/h		3456	3647	0	0	3647	1585	1781	1870	1585			
Grp Volume(v), veh/h		162	561	0	0	788	0	144	196	198			
Grp Sat Flow(s),veh/h/ln		1728	1777	0	0	1777	1585	1781	1870	1585			
Q Serve(g_s), s		2.4	0.0	0.0	0.0	14.5	0.0	6.7	8.9	10.9			
Cycle Q Clear(g_c), s		2.4	0.0	0.0	0.0	14.5	0.0	6.7	8.9	10.9			
Prop In Lane		1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h		845	2607	0	0	1540		277	291	246			
V/C Ratio(X)		0.19	0.22	0.00	0.00	0.51		0.52	0.67	0.80			
Avail Cap(c_a), veh/h		845	2607	0	0	1540		614	644	546			
HCM Platoon Ratio		2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)		0.96	0.96	0.00	0.00	1.00	0.00	1.00	1.00	1.00			
Uniform Delay (d), s/veh		18.0	0.0	0.0	0.0	18.6	0.0	34.9	35.9	36.7			
Incr Delay (d2), s/veh		0.0	0.2	0.0	0.0	1.2	0.0	0.6	1.0	2.3			
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln		0.9	0.1	0.0	0.0	5.9	0.0	2.9	4.0	4.2			
Unsig. Movement Delay, s/veh													
LnGrp Delay(d),s/veh		18.0	0.2	0.0	0.0	19.8	0.0	35.5	36.9	39.0			
LnGrp LOS		B	A	A	A	B		D	D	D			
Approach Vol, veh/h			723			788			538				
Approach Delay, s/veh			4.2			19.8			37.3				
Approach LOS			A			B			D				

Timer - Assigned Phs	2			5	6		8					
Phs Duration (G+Y+Rc), s	71.0			27.0	44.0		19.0					
Change Period (Y+Rc), s	5.0			5.0	* 5		5.0					
Max Green Setting (Gmax), s	49.0			6.0	* 39		31.0					
Max Q Clear Time (g_c+I1), s	2.0			4.4	16.5		12.9					
Green Ext Time (p_c), s	5.9			0.0	7.6		1.1					

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

User approved ignoring U-Turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	11.3
Intersection LOS	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	104	49	113	131	131	184
Future Vol, veh/h	104	49	113	131	131	184
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	139	65	151	175	175	245
Number of Lanes	1	1	0	2	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	10.2	11.8	11.5
HCM LOS	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	72%	0%
Vol Thru, %	0%	0%	100%	0%	28%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	131	184	104	49	157	87
LT Vol	131	0	0	0	113	0
Through Vol	0	0	104	0	44	87
RT Vol	0	184	0	49	0	0
Lane Flow Rate	175	245	139	65	209	116
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.315	0.36	0.238	0.099	0.368	0.193
Departure Headway (Hd)	6.491	5.282	6.17	5.459	6.345	5.98
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	555	682	582	657	568	601
Service Time	4.22	3.01	3.903	3.192	4.077	3.711
HCM Lane V/C Ratio	0.315	0.359	0.239	0.099	0.368	0.193
HCM Control Delay	12.2	11	10.8	8.8	12.7	10.1
HCM Lane LOS	B	B	B	A	B	B
HCM 95th-tile Q	1.3	1.6	0.9	0.3	1.7	0.7

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	53	52	137	107	18	102
Future Vol, veh/h	53	52	137	107	18	102
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	56	55	144	113	19	107
Number of Lanes	1	0	0	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	1
HCM Control Delay	7.9	9.6	8.2
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1
Vol Left, %	100%	0%	0%	56%
Vol Thru, %	0%	0%	50%	44%
Vol Right, %	0%	100%	50%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	102	105	244
LT Vol	18	0	0	137
Through Vol	0	0	53	107
RT Vol	0	102	52	0
Lane Flow Rate	19	107	111	257
Geometry Grp	7	7	2	2
Degree of Util (X)	0.031	0.139	0.13	0.319
Departure Headway (Hd)	5.863	4.655	4.225	4.469
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	611	771	849	806
Service Time	3.591	2.382	2.248	2.488
HCM Lane V/C Ratio	0.031	0.139	0.131	0.319
HCM Control Delay	8.8	8.1	7.9	9.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4	1.4

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	28	3	3	91	155	31
Future Vol, veh/h	28	3	3	91	155	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	50
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	3	3	102	174	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	282	174	209	0	-	0
Stage 1	174	-	-	-	-	-
Stage 2	108	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	708	869	1362	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	916	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	707	869	1362	-	-	-
Mov Cap-2 Maneuver	707	-	-	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	916	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1362	-	720	-	-
HCM Lane V/C Ratio	0.002	-	0.048	-	-
HCM Control Delay (s)	7.7	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	6	7	39	26	3
Future Vol, veh/h	5	6	7	39	26	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	7	8	44	30	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	92	32	33	0	-	0
Stage 1	32	-	-	-	-	-
Stage 2	60	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	908	1042	1579	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	963	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	903	1042	1579	-	-	-
Mov Cap-2 Maneuver	903	-	-	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	963	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	1.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1579	-	974	-	-
HCM Lane V/C Ratio	0.005	-	0.013	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

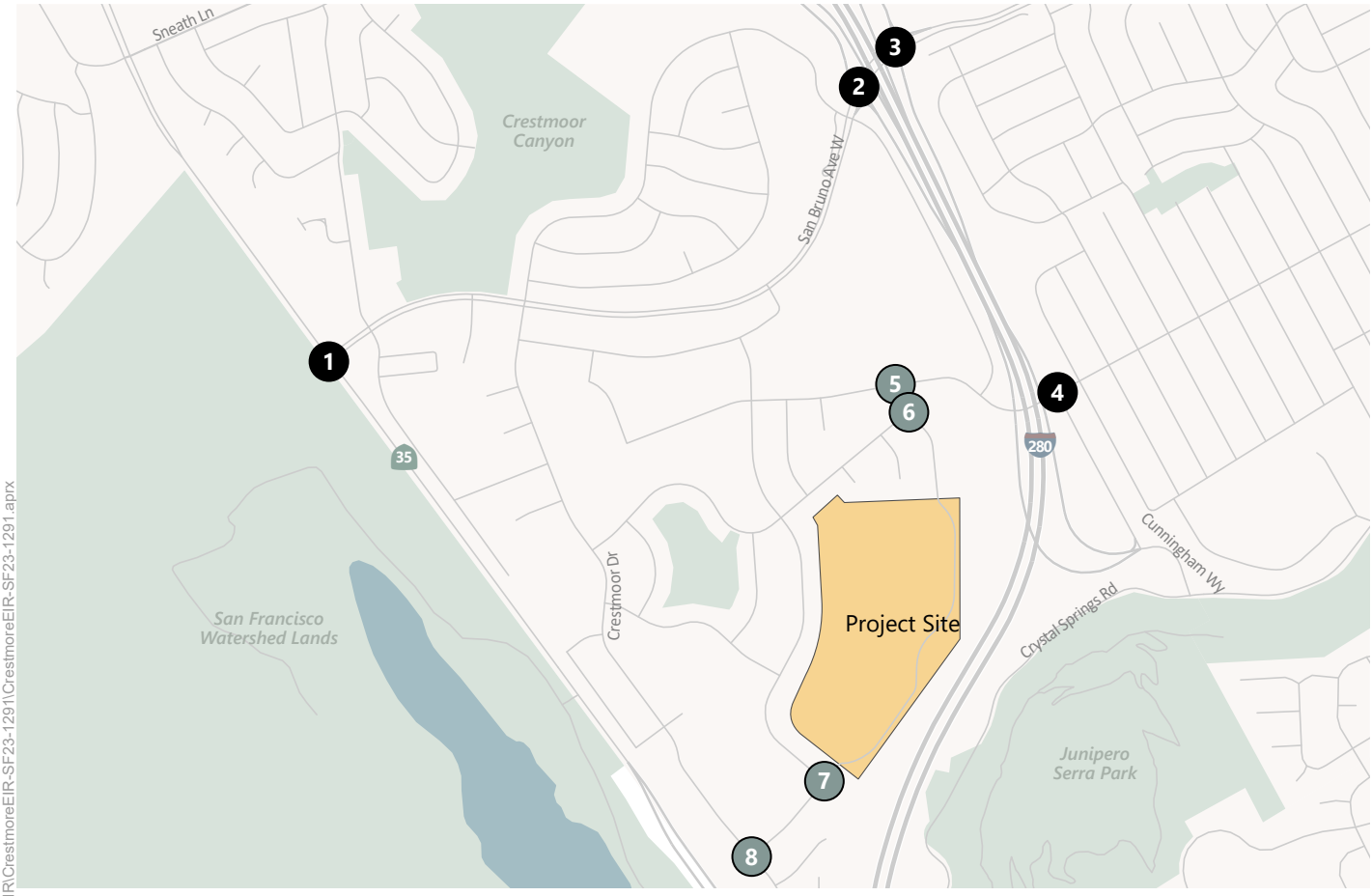
Intersection	
Int Delay, s/veh	3

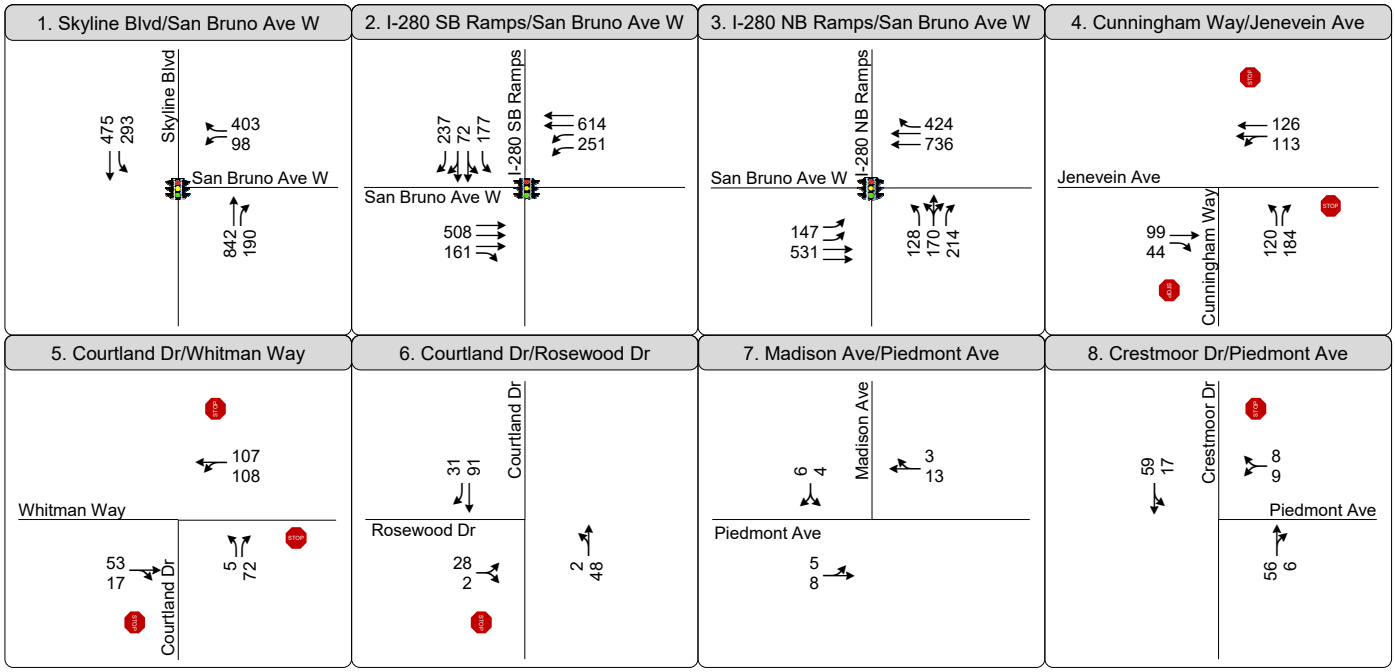
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	12	18	56	11	43	59
Future Vol, veh/h	12	18	56	11	43	59
Conflicting Peds, #/hr	6	0	0	0	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	20	63	12	48	66

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	239	71	0	0	77	0
Stage 1	71	-	-	-	-	-
Stage 2	168	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	749	991	-	-	1522	-
Stage 1	952	-	-	-	-	-
Stage 2	862	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	718	989	-	-	1519	-
Mov Cap-2 Maneuver	718	-	-	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	828	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	3.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	859	1519	-
HCM Lane V/C Ratio	-	-	0.039	0.032	-
HCM Control Delay (s)	-	-	9.4	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0.1	-





Legend

Study Intersections

- LOS Analysis Intersections
- Signal/Stop Warrant Analysis Intersections

Project Site

- Project Site

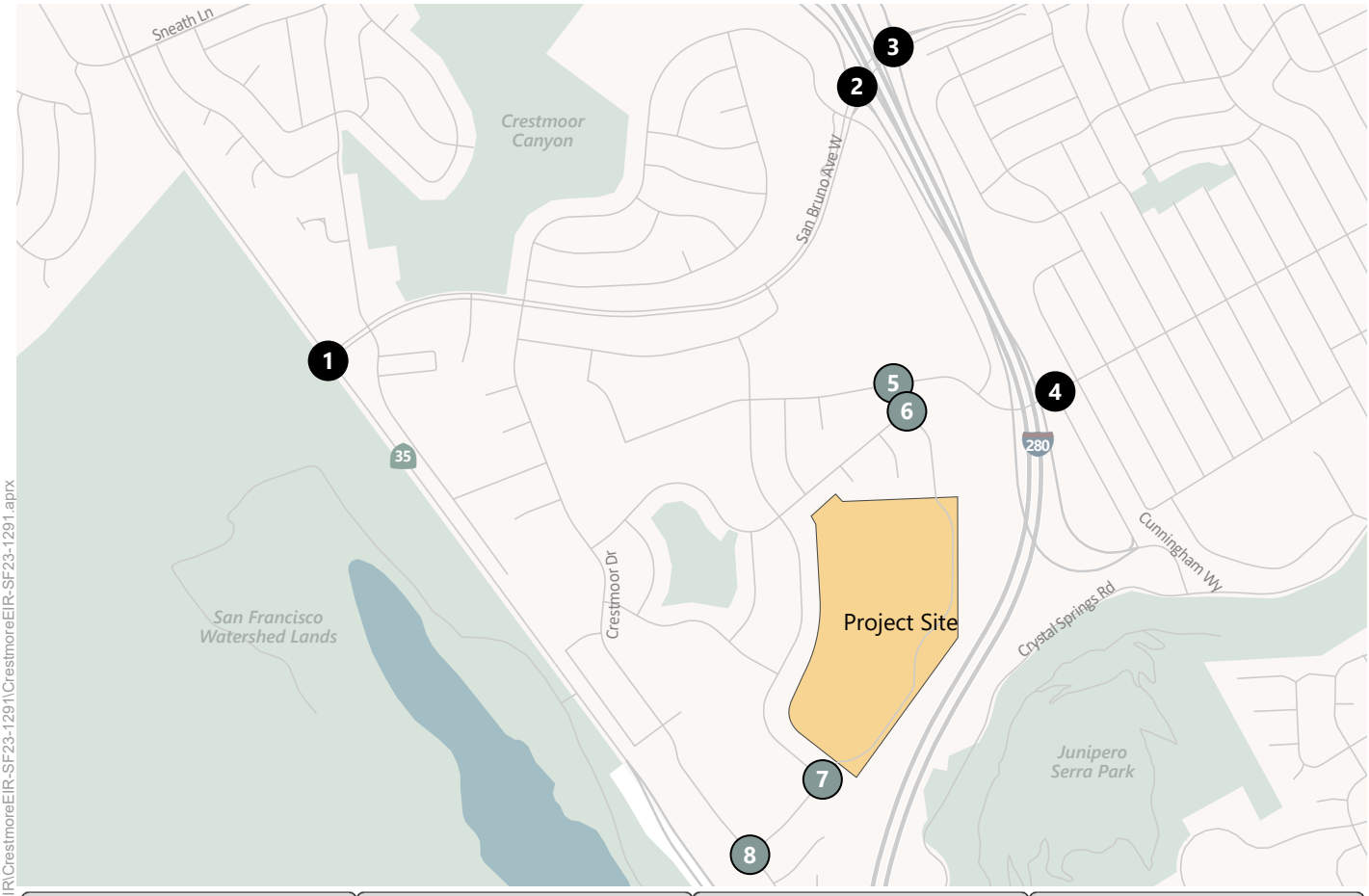
PM Peak Hour Traffic Volume

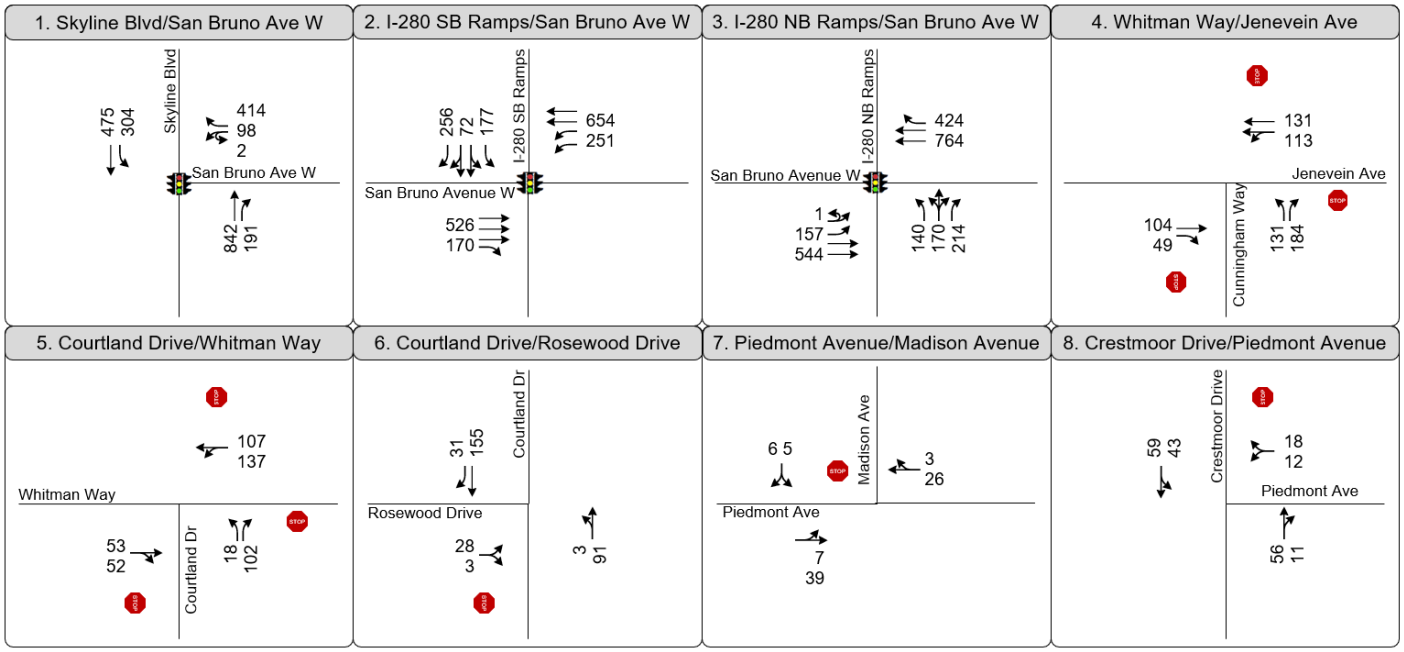
- Lane Configuration
- Stop Sign
- Signalized

Figure XX

Study Intersections and Existing Turning Movement Volumes

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Legend

Study Intersections

- LOS Analysis Intersections
- Signal/Stop Warrant Analysis Intersections

Project Site

- Project Site

PM Peak Hour Traffic Volume

- Lane Configuration
- Stop Sign
- Signalized

Figure 1

Study Intersections and Existing Plus Project Turning Movement Volumes

Appendix H

Vegetation Management Plan

LIVE OAK ASSOCIATES, INC.

CRESTMOOR (300 PIEDMONT AVENUE)
WILDFIRE MANAGEMENT
VEGETATION MANAGEMENT PLAN
(PN 2689-02)
November 10, 2022

This vegetation management plan has been prepared for the approximately 40.2-acre former Crestmoor High School site located at 300 Piedmont Avenue in the City of San Bruno. Specifically, this plan addresses an approximately 12-acre, wooded portion of the site on the west and south sides of the campus.

In the context of wildfire resilience, vegetation management involves the identification, assessment, and removal or modification of live and dead vegetation that act as ladder fuels or contribute to increased fuel loads affecting the severity and spread of wildfire. It also involves managing vegetation in a manner that prevents the spread of invasive species and plant diseases that contribute to tree mortality and increased fuel loads. Management actions and treatments typically occur in areas with heavy, dense vegetation; supporting highly flammable vegetation types; and/or near or adjacent to human-occupied areas, potential ignition sources, and critical infrastructure. As such, the objectives of this vegetation management plan are to:

1. Discuss the site's existing conditions in the context of wildfire risk.
2. Identify areas prioritized for vegetation management, including areas with high fuel loads, flammable vegetation types.
3. Synthesize the potential vegetation management actions and associated treatment types appropriate for the site in reducing wildfire risk.

Vegetation Management Objectives

While vegetation management cannot prevent a wildfire or reduce an area's wildfire risk to zero, the objectives of such management are to:

1. Increase the likelihood of success of fire suppression activities, including increased accessibility by fire response personnel.
2. Reduce the rate of fire spread.
3. Reduce fire intensity and severity.
4. Create defensible space around the proposed development.

Project Location

The project site is located at 300 Piedmont Avenue in the City of San Bruno, San Mateo County, California. The site is bounded by residential development to the north, west, and south and by

a church property and woodlands fronting Interstate 280 to the east. Located at the northern end of the Santa Cruz Mountains, San Andreas Lake occurs approximately 0.4 miles southwest of the site on the opposite side of Skyline Boulevard. The project site is in the Montara Mountain 7.5" U.S. Geological Survey (USGS) quadrangle in the eastern half of section 5 of township 4 south, range 5 west, based on the Mt. Diablo Meridian.

Project Description

SummerHill Homes is considering the site for a future residential subdivision. According to conceptual site plans (CBG 2022), buildings and infrastructure will be sited within the existing footprint of the campus and sports fields.

Priority Vegetation Management Areas (VMA)

An approximately 12-acre area on the west and south sides of the campus is densely wooded and dominated by Monterey pine (*Pinus radiata*) and red gum eucalyptus (*Eucalyptus camaldulensis*). A dense shrub layer consisting of, but not limited to, poison oak (*Toxicodendron diversilobum*), manzanita (*Arctostaphylos* sp.), and toyon (*Heteromeles arbutifolia*) is also present. This area occurs on a steep slope. This vegetation management area (VMA) should be prioritized and managed to reduce fuels. Within this VMA, focused consideration should be given to achieve defensible space requirements for the proposed new development.

Vegetation Management Actions and Treatment Types

Recommended vegetation management actions are specific to the VMA and include 1) the creation of fuel breaks and 2) selective removal of highly flammable vegetation.

<u>Fuel Breaks (shaded/non-shaded, ingress/egress)</u>

Fuel breaks are linear strips of land where trees, shrubs, grasses, snags, and dead vegetative material—all of which are fuel—have been significantly reduced or removed. Reducing fuel loads consequently reduce the severity, intensity, and rate of spread of fires. Fuel breaks also provide fire-safe routes and staging areas for fire response personnel. The creation of fuel breaks involves reducing fuels horizontally (i.e., at ground level) and vertically along a tree's lower limbs and branches. These actions break the continuity of live and dead fuels that reduce the spread of wildfire.

Fuel break types may include shaded, non-shaded, and ingress/egress routes. Shaded fuel breaks occur in areas where tree canopies are thinned to reduce wildfire spread through the canopy (Midpen 2020). Non-shaded fuel breaks occur in vegetated areas without a tree canopy, typically in grasslands, shrublands, or transition areas near structures, where vegetation has been significantly reduced. Ingress/egress fuel breaks are zones located on both sides of roadways and/or parking lots designed to accommodate fire engine and facilitate emergency access.

General treatment methods for fuel breaks involve brush clearing, annual grass height reduction, removal of invasive plants, and removal of ladder fuels under the canopy via manual and mechanical methods (Table 1). Thus, treatments are recommended for the entire VMA.

General defensible space requirements for structures involve reducing fuel loads (i.e., mowing, ladder fuels removal, thinning) within 30-100 ft from proposed new development (California Government Code 51182 and Public Resources Code Sec. 4290 and 4291).

Table 1. Fuel break types and treatments.

Fuel break type	Treatment	Location
Shaded fuel break	Mowing	Grasslands adjacent to Courtland Drive
	Brush clearing, particularly from beneath trees Removal of dead leaves, branches, or vegetation	VMA
	Crown raising (removal of lower tree limbs)	VMA
	Removal of invasive plants	VMA
Non-shaded fuel break	Mowing or hand-clearing Goat grazing, if applicable Manual or mechanical clearing of dense, non-native brush Herbicides, if applicable	Transition area between VMA and open field
Ingress/egress fuel break	Annual mowing	Zones on both sides of Courtland Dr and parking lots

Selective Tree Removal

The VMA is dominated by Monterey pine and red gum eucalyptus. Dropped eucalyptus leaves can form dense carpets of flammable material on the ground, and the peeled back can draw fire up into the tree canopy, causing a rapidly- spreading crown fire. Pine needles and resin are highly flammable, and several Monterey pines within the VMA appear to be dead or in declining health.

Eucalyptus trees may be removed from the VMA. Stumps of removed eucalyptus may be treated with herbicides to control resprouting because they can readily resprout when cut, grazed, or burned (Cal-IPC 2022). Monterey pines, or any other trees, that are dead or in declining health should also be considered for removal. Trees that are otherwise healthy can be selected for removal if they are deemed a fire hazard after other methods for fuel reduction (e.g., crown raising) have been considered.

The assessment and selection of trees for removal should be carried out by a certified arborist. An arborist should also be onsite during tree removal.

Disposal of Vegetation

Removed, cut, and pulled vegetation should be removed from the site. Removal from the site should be coordinated with the City.

References

California Invasive Plan Council (Cal-IPC). 2022. Plant assessment form: *Eucalyptus camaldulensis*. https://www.cal-ipc.org/plants/paf/eucalyptus-camaldulensis-plant-assessment-form/. Accessed November 2022.

Carlson, Barbee & Gibson, Inc. (CBG). 2022. Vesting tentative map, 300 Piedmont Avenue, San Bruno, CA.